

Tech Notes

For Diemaking and Diecutting

TN-0008
Oct, 2006

The ABC's of Fast Diecutting Press Changeover.

*It is obvious there is intense competition in the Converting Industry. This is driven by over capacity, by competitive innovation, by speed of response, by the quality and the consistency of output, by economic fluctuation, and by the cost of manufacturing. Companies are striving to create a world class manufacturing organization, which is equally adept at competing regionally, nationally, and internationally. The over riding mission statement of an effective manufacturing organization is **Safety, Speed, Quality, and Cost**, with the accent on Speed!*

This demands an effective, innovative, and well-organized operation, driven by a motivated team of technically gifted individuals who are accurately aligned with company goals and aspirations. To create an effective and an efficient process improvement program, it is vital to gather all the resources we have available, and to rapidly develop a consensus plan of action.

*This manual provides the framework for such a plan. The only ingredients missing are your ideas, your suggestions, and your experience. The manual is designed to provide a step-by-step program integrating many practical organizational options, proven techniques, and innovative options in building a **World Class System of Diecutting Manufacturing**.*

There are 25 critical disciplines, which you can implement in the order they are specified, you can complete all or part of each discipline, and you can pick and choose and mix and match key elements to meet your specific needs.

The Bottom Line? Be open minded, be flexible, be patient. be inclusive, work as a team, keep it simple, and get started, as soon as possible!

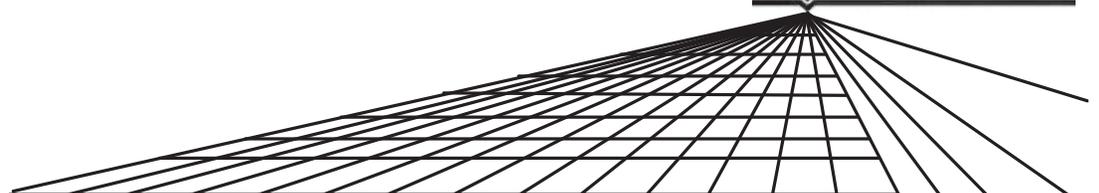


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NOTICE: The editors and publishers have endeavored to make this publication the most effective, up-to-date technical information published. All instructions, diagrams, and procedures have been checked for accuracy and ease of application; however, success and safety in the implementation of these techniques depend on individual precision, skill and caution. For this reason we cannot guarantee the results of any procedure, nor assume responsibility for any damage to property or injury to persons occasioned from execution of any procedure or technique. Persons do so entirely at their own risk.

The Author

Kevin B. Carey is the Technical Director of DieInfo and has been involved in converting, diecutting, diemaking, and related technology for more than 40 years.

Carey served a diemaking/diecutting apprenticeship in Europe, gaining experience as a Converting Master Craftsman, before becoming a trade union leader, a trainer, and a production supervisor. In 1979 he formed Lasercomb America and led it as President/CEO to become the leading innovator in commercial diemaking, CAD-CAM systems and related technology.



The experience gained in implementing progressive technology induced Kevin to change career paths in 1990 when he formed a training and process development organization dedicated to education in converting. First as a consultant, then as a trainer, a lecturer, and finally an editor, the company began to define the problem of performance in converting manufacturing, and to develop solutions to solve problems and fill knowledge gaps. It was apparent during this time there was a poor understanding of the difference between training and information and technical data management. Although poor performance is often seen as a training issue, it is more likely to be the absence of specific graphic information, which can build confidence and competence in even the most inexperienced trainee.

This experience grew into DieInfo, publishing, consulting, training, auditing, and trade show organization, whose Information Center is on-line at www.dieinfo.com.

Kevin has given hundreds of presentations to the converting industry in Europe, the Pacific Rim, and North and South America. He is the editor of DieInfo On-Line Magazines and is a frequent contributor to leading industry publications. DieInfo is an IADD sponsor company and Carey has served as an Association Director in addition to his recognition as the Diemaker and Diecutter of the year in 1986.

Carey is available for in-house training and consulting and can be reached at kevin@dieinfo.com or by calling **1.909.337.6589**.

The International Association of Diecutting and Diemaking

The IADD is a not-for-profit international trade association serving diecutters, diemakers, and industry suppliers worldwide. The Association serves as a worldwide leader and catalyst in inspiring industry success and the ultimate benefits to society that the industry provides. The vision of the IADD is to be the definitive resource for the diecutting converting industry, bringing together and serving people who convert soft to semi-rigid materials into various cut parts. By sharing collective knowledge, expertise and information, the IADD leads and stimulates creativity and innovation, provides opportunities for professional growth, serves the diverse needs of all industries engaged in diecutting and demonstrates commitment to ensuring progress through participation.

IADD provides conferences, educational and training programs, networking opportunities, a monthly magazine, technical articles, regional chapter meetings, publications and training manuals, recommended specifications, videos and surveys. IADD also presents the *Diecutting Odyssey*, a unique trade show and innovative concept in technical training featuring a hands-on Techshop™ where training programs come alive in an actual working diemaking and diecutting facility inside the exhibit area.

Introduction

The goal of this technical publication is to provide you with information, which will enable you to take action, to implement fast, consistent, and effective changeover in platen diecutting. Naturally, any significant change will require the cooperation of many members of the production team and those organizations who supply you with tools and material.

This will require you to become a teacher, a problem solver, a mentor, an effective communicator, a student, and a team builder! Manufacturing is about teamwork and improving the current system of manufacturing requires a consensus. Developing a consensus or an open-minded willingness to consider new ways to do things is far more difficult than solving the problem of dust and loose fiber!

It is useful to consider this quotation from William G. Dyer;

“People do not change easily or all at once. Most of us need a chance to try out new ways and to become familiar with new procedures.”

It is also useful to accept that ***Manufacturing is Research***. Every production run generates new problems, new results, new information, and the test of each procedure, each tool, and each material, provides new solutions. Unfortunately, with so many different and conflicting methods and practices, and no unified standard approach, valuable knowledge is lost every day. It is important to remember the basic goal of any professional manufacturing organization is knowledge and skill parity, combined with procedural consistency.

Therefore, our goal is to seek the fastest, the best and the simplest method of doing things, and to continuously integrate individual knowledge and experience into a series of standard operating procedures. This requires a structured and logical approach to productive improvement. ***First*** by listing all of the current alternative procedures, ***second*** in implementing each technical option under the same conditions, ***third*** in discarding obsolete practices, ***fourth*** in developing a bullet proof specification for each approved method and ***fifth***, in developing a consensus in applying the most effective practice.

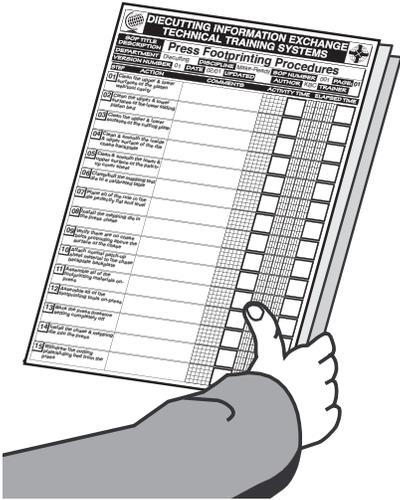
Realistically, the economics of converting, the drive for greater speed and yield, the demand for higher quality and better product consistency, the challenge of sustaining faster-simpler lower cost manufacturing, have all undermined current methods and practices. The benefits of adopting a more effective method of diecutting paperboard is not really a choice, as the folding carton or fluted box purchaser is looking for an “***engineered-container***,” and the demand for consistent quality, with lower costs and increasingly competitive turnaround time, is non negotiable.

Therefore, to achieve the productive benefits of precision diecutting we would recommend you use this manual in a number of ways. The manual is organized to present a series of technical pictures or storyboards designed to illustrate key elements of platen diecutting. Although it is critical to impart new knowledge, to invigorate traditional skills, and to energize current methods and procedures, this manual has another important purpose.

When suggesting radically different techniques to one's colleagues, and driving fundamen-



tal change to long established, however flawed practices, there will be inevitable resistance. To support progressive improvement and to counter healthy technical skepticism, the manual should be used in a number of ways. These would include the following:



- *As an education tool for discussion, teaching and for training.*
- *As a communication device to aid in developing an understanding of the converting process.*
- *As a technical data base to build a foundation of knowledge and collect practical experience.*
- *As a brainstorming format for the generation of innovative ideas.*
- *As a problem solving guide to assist in developing solutions.*
- *As the foundation for the creation of standard operating procedures.*
- *As the basis for developing an effective manufacturing specification for converting.*
- *As a reference work and the beginning of converting "library."*
- *As a product and tool design guide.*
- *As a weapon to eliminate aimless speculation!*

It is also useful to remember a quotation from George F. Nordenholt who stated:

"No matter how big and tough a problem may be, get rid of confusion by taking one little step toward solution. Do something. Then try again. At the worst, so long as you don't do it the same way twice, you will eventually use up all the wrong ways of doing it and thus the next try will be the right one!"

There are six key technical disciplines in Converting Manufacturing. ***These are Cutting, Creasing, Scoring, Perforating, Embossing, and Debossing.*** To effectively diecut the wide and constantly changing range of cellulose materials, it is essential to learn, to understand, to master and to apply the skills of converting. The foundation discipline in this process is Platen Diecutting. To ensure effective and efficient converting manufacturing it is vital to achieve and to sustain a stable kiss-cut make-ready, because without the stability generated by a kiss-cut impression, the performance of the converting disciplines will be compromised and undermined.

And finally, as I am constantly searching for better, and faster, and simpler methods, if you have any questions, suggestions, or recommendations about the elimination of dust and loose fiber, I will be delighted to hear from you.

Chapter 1:

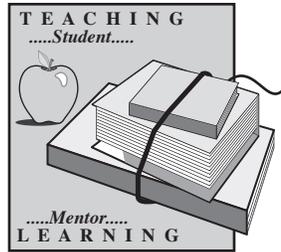
Introduction: A Path to a More Productive Future.

"Commit yourself to lifelong learning. The most valuable asset you'll ever have is your mind and what you put into it." Brian Tracy

Cautious Skepticism is Healthy!

"All uncertainty is fruitful ... so long as it is accompanied by the wish to understand." Antonio Machado

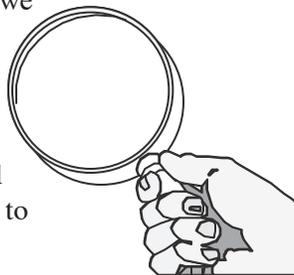
One of the most important and healthy instincts we possess is our insatiable curiosity.



It is in our nature to inquire, to seek knowledge, to find better ways to do things, and to pursue a safer, more secure, and a more rewarding life for our family and ourselves. Every day we gain new information about our

world, about our environment, and about our work. When we are tuned in, we focus on turning this stream of valuable data to our advantage. Even our cautious skepticism and our occasional cynicism are healthy responses to the challenge of new knowledge.

However beneficial new knowledge is challenging. Education generates information, fostering change, action, adjustment, and sometimes uncertainty. The danger is not in how we respond to new information but in an occasional urge to resist change and attempt to live in the past. Not that the past is necessarily bad. In fact, education is about progressive change, where we build upon a foundation of past success and with the experience gained from inevitable failure, old methods are upgraded, outdated practices are discarded, and new procedures are incorporated, to consolidate the best of the best.



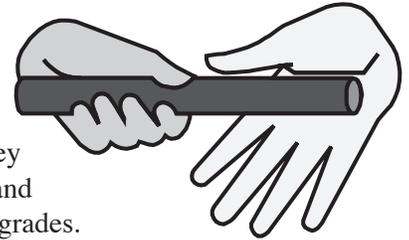
Create a Team Approach to Progressive Change.

"Education makes people easy to lead, but difficult to drive; easy to govern, but impossible to enslave."

Henry Peter Brougham

Unfortunately, this is where we can struggle as an industry. It is true most people are uncomfortable with constant daily change, and each person has a different ability to accept and assimilate new ways to do things. The most

effective method of dealing with process improvement is to assemble the work team or a number of key players to brainstorm and determine potential upgrades.



This team would then design an implementation plan for a limited number of changes, review the results after a specified period of time or a number of production cycles, and then approve or modify and retest the new methods. Even then the procedures should be carefully documented, benchmark time standards established to determine performance measurement, and then the complete sequence or the upgraded practice videotaped. The team would then determine a period of time for the work team to get used to the new way of doing things, to practice the new techniques, and then to stabilize the modified system of manufacturing.

In this way, all of the team members are involved, there is adequate time for discussion, adjustment, and learning, and the organization is making constant productive progress.



It is important to recognize although change brings uncertainty and a temporary lowering of operating confidence, it ultimately ensures greater competence and experience. What are the benefits of education and learning?

Knowledge is Power!

"There is no knowledge that is not power."

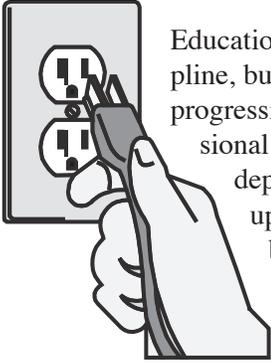
Ralph Waldo Emerson

What are the benefits of committing to daily education and building a learning organization?

- ➔ To anticipate and solve problems
- ➔ To reduce frustration and stress
- ➔ To gain leverage and influence
- ➔ To improve our professional value

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- To increase job security
- To take productive action
- To simplify complex tasks
- To gain competitive advantage
- To gain respect, appreciation and praise
- To share knowledge and skill with our colleagues
- To build a more productive future



Education is not a static, esoteric discipline, but it is about action, change, and progressive improvement. As a professional craftsman or woman, our future depends upon our ability to be up-to-date, to be innovative, and to be productively flexible. It is our most important asset. If it is so critical to the individual, to the team, and to company suc-

cess, what goals should we be pursuing in expanding our knowledge and our skill?

Personal Goals for the Master Crafts Person

“You are your first product, so positioning yourself in the market as an individual is extremely important.”

Portia Isacson

What are the goals you should be considering as you begin using this manual or committing to productive improvement? These could be:

- To develop an effective career and job strategy
- To develop technical competence and confidence
- To define current knowledge limits and potential for improvement.
- To consolidate, organize, and energize your skills
- To be the very best you can be
- To develop a knowledge and technical information network
- To develop reference resources and data outlets
- To be less frustrated, more proficient, faster & better
- To gain recognition from peers, company & industry
- To leverage more money and gain greater job security.

You should reorganize, modify, and augment this list to reflect your own ideas and your specific goals. A good piece of advice is to start keeping a daily record of activi-



ties, actions, and results. Therefore, it is vital you begin keeping a daily journal, to record your ideas, to collect information, to brainstorm, to make notes, and to remain focused upon your goals.



If these are your personal goals, what are the professional aspirations you should become dedicated to?

Professional Goals for the Master Crafts Person

“Acquire new knowledge whilst thinking over the old, and you may become a teacher of others.” Confucius

What are the goals you should be considering in terms of your career as a Master Craft Professional? These could be:



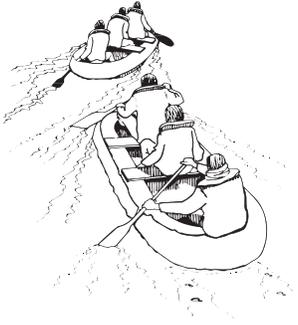
- To create an effective plan of action
- To close the knowledge and skill loop
- To evaluate current methods and practices
- To find simpler, faster, and better methods
- To learn how others solve key problems
- To evaluate your knowledge, skill and ability
- To improve career prospects and opportunity
- To eliminate specific technical issues and bottlenecks
- To understand the science and the underlying theory
- To develop mastercraft status and recognition

No matter what your position, what you do, or your current status, developing master craft ability, or optimal professional skill, should be a by-product of every daily activity. However, you are not isolated and you work in, and with, a team of people, who may need your help, who may seek your guidance, and who may need your leadership.

In reality, you should be a positive and productive force in all of the teams you participate in, however, to be a great team player, it is obviously important to have a professional foundation of integrity, of openness, and as part of the team, dedicated to being the best you can be.

What are the appropriate goals for the Production Team?

"You should have enough education so that you won't have to look up to people; and then more education so that you will be wise enough not to look down on people."
M.L. Boren



What are the goals you and the production team should be considering in terms of your work together in a professional team? These could be:

- To work safely, at higher speed, with better quality, and lower cost
- To accelerate knowledge and skill development and to learn from each other.
- To resolve technical disputes and unify the best methods
- To align the best techniques, methods, and procedures
- To generate the best ideas, best practices, and best performance
- To create a technically balanced professional work team
- To create a vibrant technical partnership
- To create an effective training program
- To build an industry library and reference foundation
- To create a world class manufacturing team



Good teamwork begins with good communication. Try to involve the entire team, at some level, in brainstorming, in discussion, in determining technical changes, and in making important decisions. A great quote from Hamilton Barksdale illustrates the challenge of building an effective team; *"The whole object of the organization is to get cooperation, to get to each individual the benefit of all of the knowledge and all of the experience of all of the individuals."*

Successful manufacturing relies upon powerful people, who cooperate and work for each other, who put each other first, and who are committed to teamwork. Manufacturing is generally a team sport, and it is impossible to make it to the World Series without a great team.

Successful manufacturing relies upon powerful people, who cooperate and work for each other, who put each other first, and who are committed to teamwork. Manufacturing is generally a team sport, and it is impossible to make it to the World Series without a great team.

We have discussed personal, professional, and team goals, but what of the organization who is making all of this possible, and who is investing in your success. What are the company goals?

Goals for the World Class Converting Organization

"The magic formula that successful businesses have discovered is to treat customers like guests and employees like people." **Thomas J. Peters**

It is obvious there is intense competition in the Converting Industry. This is driven by over capacity, by competitive innovation, by speed of response, by the quality and the consistency of output, by economic fluctuation, and by the cost of manufacturing.



Companies are striving to create a world class manufacturing organization, which is equally adept at competing regionally, nationally, and internationally. The over riding mission statement of an effective manufacturing organization is Safety, Speed, Quality, and Cost. **See below.**



This demands an effective, innovative, and well-organized operation, driven by a motivated team of technically gifted individuals who are accurately aligned with company goals and aspirations. What are the goals of your organization, which is making an investment in your technical education?

- To build a World Class organization
- To develop the best system of manufacturing
- To develop a fast cycle "learning" operation
- To develop procedural uniformity and performance parity
- To generate optimal and consistent output quality
- To maximize output speed and yield
- To eliminate errors and mistakes
- To reduce waste and develop the lowest cost of manufacturing
- To accelerate changeover and competitive performance
- To create a World Class manufacturing Team.

So far we have examined potential personal, profession-

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al, team, and company goals, but what other elements of manufacturing are critical to success. In essence, all types of manufacturing are about the movement of information and material. Therefore, it is important to gain knowledge about the importance of developing a comprehensive information management system for converting manufacturing. It is vital to integrate the discipline of time management, statistical evaluation, and of establishing benchmark standards for key activities.

Finally, it is critical to set up an effective system of performance measurement, to ensure all the changes, and



upgrades and improvements are delivering the productive output they promise. Therefore, what are your team, and your company goals in terms of developing a greater use of valuable information resources?

Information Management: The Keys to the Kingdom

“If you get all the facts, your judgment can be right; if you don’t get all the facts, it can’t be right.” Bernard M. Baruch

What are the essential goals of creating an effective technical, commercial, and performance information system?

- ➔ *To understand the role, the power, and the value of information*
- ➔ *To develop an understanding of how accurate information drives manufacturing success.*
- ➔ *To develop information collection and management systems*
- ➔ *To find and define all current information sources*
- ➔ *To collect and collate all current information*
- ➔ *To determine what information is currently missing and incomplete*
- ➔ *To develop a technical internal & external information resource*
- ➔ *To develop a scientific approach to manufacturing*
- ➔ *To educate the organization about information management*
- ➔ *To develop accurate terminology and precise communication methods & practices*

It will take time for everyone to understand the role, to understand the importance, and to understand the value of good information. To build a world class organization, it will be necessary to patiently educate every key player about how a comprehensive technical data system is essential for productive converting.

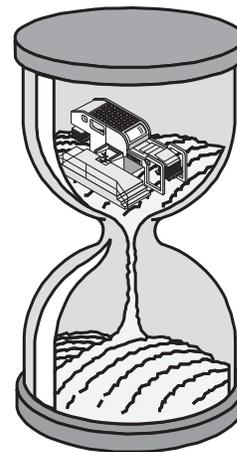


As Claude Bernard noted, “A fact in itself is nothing. It is valuable only for the idea attached to it, or for the proof which it furnishes.”

Why is Time Management so Critical to Manufacturing Success?

“A sense of the value of time—that is, of the best way to divide one’s time into one’s various activities—is an essential preliminary to efficient work; it is the only method of avoiding hurry.” Arnold Bennett

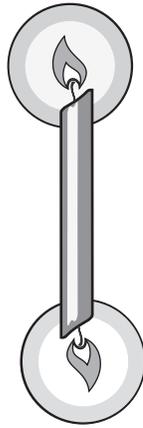
In manufacturing time is at once the most valuable and the most poorly utilized resource. Every element of the process hinges on prudent time management. Therefore, time management is one of the most important creative disciplines in building and maintaining a productive production process. How should time management be used?



- ➔ *To determine how time is consumed in the manufacturing operation*
- ➔ *To establish current “baseline” performance standards*
- ➔ *To find the fastest, the simplest and the safest way to do things*
- ➔ *To establish clear, fair, and acceptable performance benchmarks*
- ➔ *To establish a priority for analytical and remedial action*
- ➔ *To evaluate competing procedural options and practices*
- ➔ *To organize ‘just-in-time’ efficient work areas*
- ➔ *To focus upon and eliminate non-value added activity*
- ➔ *To create an understandable and fair system of measurement*
- ➔ *To reduce stress, physical exertion, and fatigue.*

Time management is the most important discipline in manufacturing, as it is in life. We have a limited number of hours to accomplish things and the universal drive is to make the most of our time. As Peter Drucker observed, ***“Time is the scarcest resource, and unless it is managed nothing else can be managed.”***

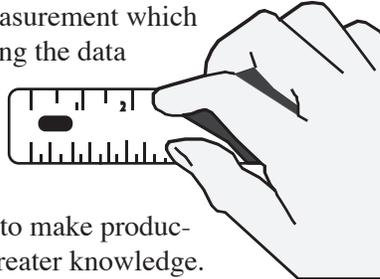
To repeat, time is our most valuable and yet most volatile resource. We must manage it effectively or it will manage us!



Why is Process Measurement so Critical to Manufacturing Success?

“The real contest is always between what you’ve done and what you’re capable of doing. You measure yourself against yourself and nobody else.” Geoffrey Gaberino

It is important to establish a fair, an understandable, and an effective system of measurement. Therefore, the goal is to create a system of measurement which enables the person collecting the data to understand the information, to gain a fresh insight into what is happening, to be able to act upon the information, and to make productive changes based upon greater knowledge. In addition, the collected data should provide information the entire teams and the entire organization can use to consolidate expertise, to improve productive throughput, and to increase converting product quality.



A good performance measurement system should enable the team:

- ➔ *To determine what must be measured and why*
- ➔ *To determine what is currently happening and why*
- ➔ *To determine and define current performance parameters*
- ➔ *To establish current performance benchmarks*
- ➔ *To integrate statistically based graphic key result analysis*
- ➔ *To establish baseline performance bottlenecks and standards*
- ➔ *To prioritize the development of measurement techniques*
- ➔ *To analyze success, errors, and opportunities*
- ➔ *To set a course for achievable productive improvement*

➔ *To increase productivity and improve product quality*

The goal of an effective system of measurement is to educate, to expand knowledge, and to find easier, faster, and better ways to do things. Good measurement is an important tool in building a more productive operation.

What is the most effective approach to using this manual productively?

“Knowledge is of two kinds; we know a subject ourselves, or we know where we can find information about it.” Samuel Johnson



The power of ongoing education is it enlightens, energizes and expands current knowledge. By combining these new techniques and manufacturing concepts with your existing knowledge and experience, unique new methods and practices will emerge. The challenge of new information and ideas, is they should act as a catalyst, they should fill knowledge gaps, and they should inspire the work team to higher levels of competence and performance. Therefore, it is important to integrate these ideas carefully.

- ➔ *Share the information and cautiously discuss the ideas and concepts*
- ➔ *Break each section/discipline into separate binders*
- ➔ *Collect and document every piece of existing data about each discipline*
- ➔ *Test and evaluate new techniques and upgraded practices*
- ➔ *Brainstorm and integrate the best of the old with new techniques*
- ➔ *Assign responsibility for action on selected disciplines to work teams*
- ➔ *Test, evaluate, modify, and develop a consensus procedure*
- ➔ *Develop a new standard operating procedure for each discipline*
- ➔ *Develop new performance benchmark standards*
- ➔ *Implement a re-training program for each upgraded discipline*

It is vital to use the knowledge, the information, and the ground breaking concepts contained in this program as a

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positive catalyst to promote productive change. You will in affect become a teacher, a mentor, and a leader, as you make steady but cautious progress.

How to implement an Effective Plan of Action?

“Training is the teaching of specific skills. It should result in the employee having the ability to do something he or she could not do before.” Mary Ann Allison

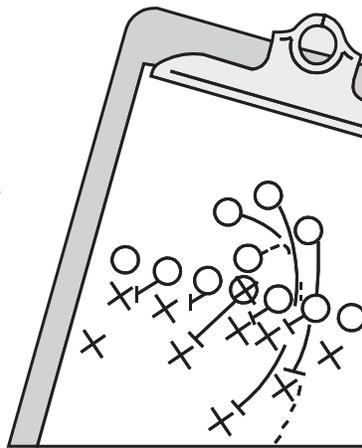
To implement an effective plan of action the following steps should be considered:

- ➔ *Make a presentation of the manual, program, and key concepts to the management and work teams*
- ➔ *Follow up with a brainstorming and discussion session with the work team*
- ➔ *Add team ideas, modifications, and suggestions*
- ➔ *Select and prioritize a number of key actions*
- ➔ *Assign team and/or individual responsibility*
- ➔ *Assign each team to develop and submit a consensus plan of action*
- ➔ *Document key steps, plan and schedule production testing*
- ➔ *Define measurement methods and criteria*
- ➔ *Implement upgraded practice and monitor results*
- ➔ *Complete team meetings to discuss results, to make changes, and retest*

Clearly the new procedure should be documented, even though it is likely existing practices and methods are poorly defined.

Eventually, the approved procedure should be videotaped, integrated into a Training Map, and used as the basis for individual training and certification.

With this new information, your knowledge and experience, and with the ideas and suggestions of your colleagues, we can build a more productive system of converting manufacturing. Remember, whatever you decide will be ultimately more effective, when the plan represents a team consensus, no matter how difficult that is to achieve. But we must begin, we must take action, and we must move forward.



DEVELOPING A PRODUCTIVE PRESS SET-UP STRATEGY

A Path to a More Productive Future:

Summary

“First study the science, and then practice the art which is born of that science.” Leonardo de Vinci

Our current systems of diemaking, diecutting, and manufacturing are severely inhibited by a poor understanding of the principles of the process, and by disarray of poor and incomplete technical data. Further compounding the problem are inconsistently applied practices, inferior measurement methods, combined with poor time management and benchmarking. Finally, our greatest weakness is a failure to turn every production cycle into a learning opportunity.



There are two quotes worthy of consideration here. The first is from Roger Von Oech when he stated, “Remember the two benefits of failure. First, if you do fail, you learn what doesn’t work; and second, the failure gives you the opportunity to try a new approach.” And the second quote is from Rudyard Kipling, ***“I keep six honest serving-men, They taught me all I knew; Their names are What and Why and When, And How and Where and Who.”***

Therefore, with new information, your current knowledge and experience, and with the ideas and suggestions of your colleagues, we can build a more productive system of converting manufacturing. But we must begin, we must take action, and we must move forward.

Having invested valuable time in both reading this technical report it is time to convert your education initiative into pragmatic action. What are basic steps you should consider?

- 1. Make a presentation of the manual, program, and key concepts to the management and team leaders.***
- 2. List, discuss and define the key points presented, & recommended action and priority.***
- 3. Follow up with a brainstorming and discussion session with the work team***

- 4. Add team ideas, modifications, and suggestions**
- 5. Prioritize issues to be investigated & researched**
- 6. Compare current practices with technical recommendations and elect and prioritize a number of key actions**
- 7. Combine and integrate new and established practices**
- 8. Prioritize actions and production testing and assign team and/or individual responsibility**
- 9. Define the number of tests, the key steps, and then plan and schedule production testing**
- 10. Define methods and criteria, & determine key benchmarks for measurement**
- 11. Appoint test and documentation responsibility, and a timeline to implement upgraded practices & monitor results**
- 12. Complete team meetings to discuss results, to make changes, and retest**

Remember, the new procedure should be documented as it is proven and approved, even though it is likely existing practices and methods are poorly defined. Eventually, the approved procedure should be videotaped, integrated into a Training Map, and used as the basis for individual training and certification. It is important to recognize the validity of this quote from Mary Ann Allison when you are assessing productive progress. ***“Training is the teaching of specific skills. It should result in the employee having the ability to do something he or she could not do before.”***

One key error to avoid, is to work hard to create an effective plan of action, and then failing to be realistic about the implementation of the plan. Treat process improvement with the importance it deserves. For example any process improvement action, task, or initiative should be scheduled just like any other production task or job! Most companies pay lip service to process improve-

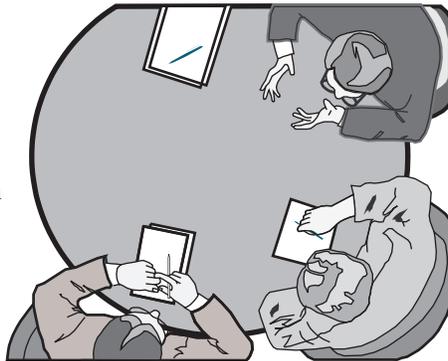
ment but work at it only when there is time or there is no production work. As a result, process improvement is painfully slow and often is simply a plan of action gathering dust in some obscure filing cabinet. Process improvement is essential to gain time, to generate speed and throughput, and to energize productive potential. It is as important as any customer job, and your customers will repay your continuous performance improvement by loyalty and more work.

This is a great opportunity to start over and redefine the process with a fresh approach. Combining the best of the old with new ideas, improved techniques, and better methods. After you have had time to digest this information, collected your thoughts, and put everything together in an action plan, the team can make a new beginning. It is useful to create a **“subject”** book or manual, to make notes, record key information and tool parameters, and collect results.

But remember the challenge of productive change is as simple as it is powerful! Schedule process improvement as a vitally important change in the performance capability of the organization and not as a filler when and if time is available!

Also, it is useful to always remember mistakes are inevitable! However, if they are regarded as opportunities, as a way to eliminate another variable, as a tool to increase our understanding, and as a guide to change the way we do things next time. We will have made an important step forward. Make something productive happen. Be passionate, patient, relentless, fair, steadfast, open minded, and endlessly curious. And remember ***“Education is not filling the bucket but lighting a fire.”*** William Butler Yeats

If you need technical assistance, advice, or recommendations, please call, we will be delighted to hear from you. Good luck with this project.



Chapter 1:

A Path to a More Productive Future: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ Cautious skepticism represents a healthy outlook, but to be skeptical you have to listen to and to keep an open mind to new, different, or radical suggestions.
- ✓ Teamwork in manufacturing is the basis for productive success, and building effective team work is the most challenging task faced by the organization.
- ✓ Professional and personal success is a function of acquired knowledge and experience; knowledge and experience is a function of education and learning; and daily education and learning are the foundation for success.
- ✓ To be an effective well balanced team player you have to be an effective, well balanced individual. By setting and reaffirming personal goals you can develop your energy, your attitude, and your participation, to help yourself and the rest of the team you work with.
- ✓ As a professional craftsman it is important to continuously define where you are, where you are going, and to have a plan of action to get there.
- ✓ To build a great team it is important to communicate openly and often; it is critical to

discuss and consult; and it is vital to develop a vision and a mission, that the entire team can be inspired by.

- ✓ In becoming a professional craftsman and in building a great team approach to diecutting, it is strategically important to recognize you are competing against other teams, in other organizations, in other parts of the world. Being the best you can be is not limited by geography.
- ✓ Information is the life blood of effective manufacturing, and it is important to strive to expand, to consolidate, to verify, and to distribute the information on a daily basis.
- ✓ Time is our most valuable and our most volatile resource, therefore, it is imperative to use time as a tool to guide, to measure, and to assess performance.
- ✓ It is said of manufacturing, if we are unable to measure something, it is impossible to manage it! Measurement is an information tool, it is an education tool, and it is an unbiased judge of progress.
- ✓ This manual and this program are a guide, and the goal is to compliment and augment your skills and ability, and challenge your knowledge and experience. It is simply a tool for change, and a tool which you control.

Chapter 1:

A Path to a More Productive Future: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further, more sophisticated principles and more complex techniques...

- ✓ What do you think is the most appropriate reaction to new ideas and suggestions, particularly where they challenge or contradict current methods and practices?
- ✓ How would you organize the production team to focus everyone in diecutting manufacturing on a unified plan of action?
- ✓ Would you accept the statement, that knowledge is power, and if so, how would you organize a daily education and learning program for yourself and your colleagues?
- ✓ How would you describe your personal goals as a key member of the diecutting manufacturing team?
- ✓ In aspiring to be an effective, professional crafts person, how would you prioritize the goals a person in that position should be pursuing?
- ✓ If you were selected to lead the productive improvement initiative in diecutting, what goals do you feel are appropriate for the existing production team?
- ✓ How do you rate the competitive performance of other teams, in other operations, in other countries?
- ✓ Could you suggest three ways a more effective information management and collection system would improve diecutting manufacturing?
- ✓ Describe two areas of diecutting where you feel time management and just-in-time management would improve organizational performance?
- ✓ What do you think of current process measurement systems, how would you change them, and what would you add and why?
- ✓ What do you feel is the greatest impediment to making rapid performance improvement in diecutting manufacturing?
- ✓ Do you feel the organization is prepared for radical change of methods and procedures, and if not, how would you change things to make sure the organization is moving forward?

Chapter 2:

What are the Key Dynamics of Diecutting Press Changeover?

“Action to be effective must be directed to clearly conceived ends.”

Jawaharlal Nehru

Clearly the most critical discipline in Diecutting is pre-planning, including tool design and integration, and a thorough pre-press review of every key factor. This can be compared to training and preparation for the Olympic Games, however, the games only begin when the starters gun sounds, as in the changeover from one job to the next commences.

If this critical discipline is to be effective and efficient, it is vital the participants understand the strategic goal of changeover improvement. This simply means each changeover cycle is an opportunity to focus on an element of the activity, which will lead to progressive improvement. These underlying disciplines are:

- **Safety**
- **Inventory Management**
- **Standardization**
- **Measurement**
- **Benchmarking**
- **Just-In-Time Organization**
- **Simplification**
- **Education**
- **Teamwork**
- **Testing & Work Qualification**
- **Information Management**
- **Preparation & Closing-the-Loop**



It is obvious although all these things are happening during every press make-ready, it is impossible with limited resources to effectively deal with every issue. However, step-by-step, make-ready-by-make-ready, discipline-by-discipline, productive improvement can be consolidated. Why are these disciplines so important?

Clearly, every on-press action and therefore, every change to established procedures must pass through the rigorous filter of evaluating the impact on personal and team **Safety**.

Inventory Management is essential to make sure every converting tool, every component, every material, every tool, every piece of information and work-in-progress is in place, to optimize fast changeover. (It hardly makes

sense to start putting things in place when the press has ceased production!)

Standardization is vital, because without applying consistent methods and practices, it is difficult to build a foundation for analysis, for skill development, for teamwork, for change, and for evaluation.

Measurement is important to enable an evaluation to be made of change in procedures, in tool design, in set-up parameters, and in material selection.

Benchmarking is the key to evaluating procedures, to determine if change consumes more time or less time?

Just-In-Time Organization is the practice of defining the press work center in terms of the discipline used to run an effective Hospital Emergency Room.

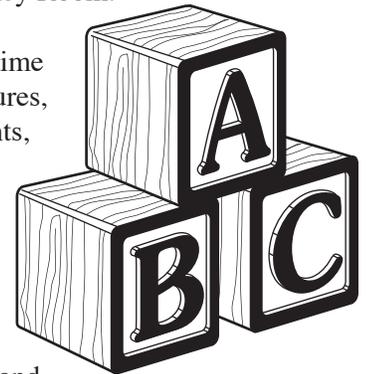
Simplification in terms of time consumed, actions, procedures, steps, number of adjustments, settings and the layout of the work area or press-work cell.

Education is essential to advancement because manufacturing is research, and the challenge is to convert new information into safer, faster, and more effective procedures.

Teamwork is at the heart of any effective organization, and diecutting changeover requires the interaction, the cooperation, and the integration of too many people to leave it to chance.

Testing and Work Qualification is one of the first standard operating procedures which should be put in place to ensure everyone applies consistent standards and consistent evaluation methods to each type of product.

Manufacturing is about the **Movement of Information and Material**; and every changeover yields valuable new information, which is the fuel to improve knowledge,



The ABC's of Fast Diecutting Press Changeover!

skill, and performance in subsequent changeovers.

Good manufacturing, as in any challenging activity, needs a good plan of action, in the form of a preparatory checklist, and a postmortem close-out to determine if the plan was effective, and/or what did we learn from this make-ready to make the next one easier.



This need not be complex and it can be as simple as asking, ***“what worked well, what worked badly, how do we improve for next time?”*** Naturally,

not everything can be fixed immediately, however, with this sort of disciplined approach, gradual prioritized incremental change is not only simple, it is inevitable.

How are you, your colleagues, and your organization dealing with these key dynamics of changeover?

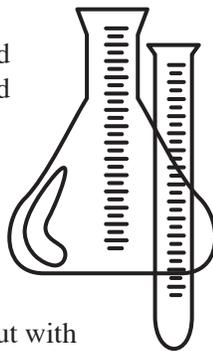
What are the Goals of Press Changeover?

“The art of progress is to preserve order amid change, and to preserve change amid order. Life refuses to be embalmed alive.” Alfred North Whitehead

It is obvious there are two over-riding requirements of the changeover team.

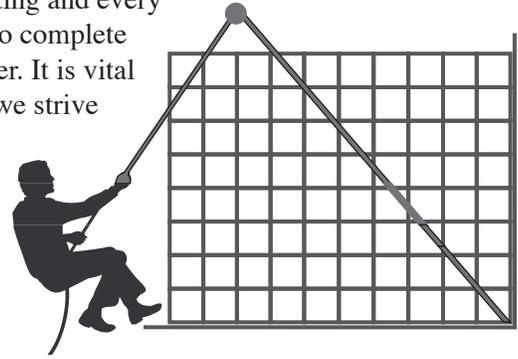
The first is to complete the changeover as quickly as possible, and the second, to make the press ready with such precision, productive output and diecut part quality are consistent from the first diecut sheet to the last. However, you would not be reading this unless you were determined to improve the discipline. Which means you want to learn, which is in reality the most important discipline in press changeover.

Manufacturing is in practice a controlled experiment, it is a test, it is research, and it is both an evaluation and progressive development of knowledge, skill, and organization. As with any other repetitive process, success is both measured in terms of performance and in performance improvement. You are not going to win a gold medal in your first race, but with training, with practice, and with the applied experience of many races, you may indeed win that medal.



Every time we complete a press make-ready we are

testing and evaluating procedures, knowledge, materials, tools, skill, teamwork, paperboard, press condition, and every setting and every action taken to complete the changeover. It is vital therefore, as we strive to improve performance from changeover to changeover we recognize



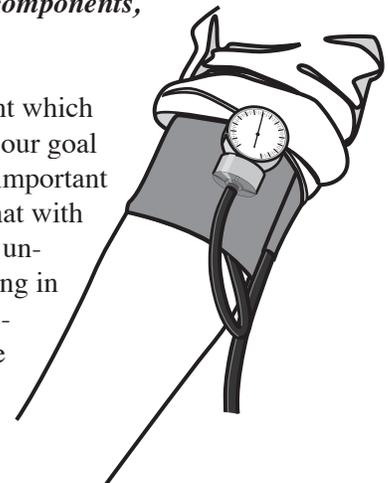
our progress is based upon how much we learn from each cycle, and in how much we apply the new knowledge or technical data to the next make-ready cycle.

This is called Closing the Education or Competence Loop. No matter where we currently stand, if we approach the discipline in the right manner, we will improve performance from one make-ready operation to the next.

So what are we testing and evaluating? We are testing, evaluating and collecting key information about:

- ➔ ***The pre-planning & close out checklist***
- ➔ ***The inventory management checklist***
- ➔ ***The specification and design of every tool***
- ➔ ***The integration and synchronization of all tools***
- ➔ ***The Just-In-Time organization or work areas/cells***
- ➔ ***The diecut material, structural design, and layout***
- ➔ ***The key materials used in the tools***
- ➔ ***The ease of fast installation/de-installation of tools***
- ➔ ***All of the press settings & the setting sequence***
- ➔ ***All of the make-ready procedures & actions***
- ➔ ***All of the information provided for the job***
- ➔ ***The layout of tools, components, and materials***

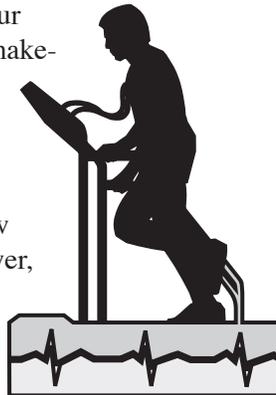
In fact, every key element which can and does undermine our goal of fast make-ready. It is important to remember however, that with limited resources we are unable to focus on everything in every make-ready. Therefore, we should prioritize our focus based upon a Pareto Key Result Analysis of press make-



ready, which will show which part of the discipline is the most costly in terms of time expenditure. To reiterate the obvious, our goals in changeover are:

- ➔ *To find the safest, fastest, most effective, and lowest cost method of achieving a productive press set-up*
- ➔ *To measure and document problems, roadblocks, bottlenecks, and obstacles*
- ➔ *To detect weaknesses in current set-up or preparation procedures*
- ➔ *To fine tune and improve current and reworked set-up procedures*
- ➔ *To set and then attack current benchmark standards and find ways to reduce the time for each key task*
- ➔ *To gain knowledge about the converting practices, product design and the product materials, and distribute this critical information to the appropriate people*
- ➔ *To evaluate tool specification, design, installation and on-press performance of all tools*
- ➔ *To develop a coordinated team approach and safe, effective, and efficient task sharing*
- ➔ *To learn as much as possible and to share that knowledge with other team members*
- ➔ *To set the press up for maximum speed, for the highest yield, for the lowest waste, and for optimal diecut part quality*

Obviously, there are other key ingredients you could add to this list. But is this the focus your teams use as they complete each make-ready? Who organizes this, who takes responsibility, who leads the initiative, and who collects the critical information? These are important questions, which few organizations are prepared to answer, and the results of avoiding these issues are poor press changeover performance!



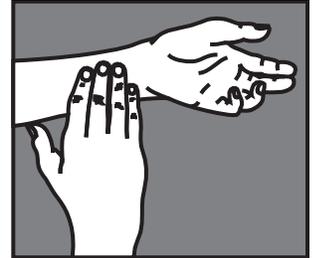
There are no shortcuts. To become highly effective at press changeover requires focus, dedication, and attention to detail, teamwork, and patience. It may seem an uphill battle at the moment, but if you had the correct press make-ready working structure, every changeover completed in the last year would have increased your knowledge, your experience, and your skill.

The goal of make-ready is knowledge. The goal of knowledge is action. The goal of action is achievement. It

is time to get started!

What is Changeover Time Management?

“A sense of the value of time—that is, of the best way to divide one’s time into one’s various activities—is an essential preliminary to efficient work; it is the only method of avoiding hurry.” Arnold Bennett



When discussing changeover, the inevitable question is quickly raised? “How long will it take?” Rarely is a clear or a specific answer provided, which is a critical problem in meeting increasingly competitive commercial deadlines.

This initial question quickly leads to two further logical inquiries. “Why is it difficult to determine how long a press make-ready is going to take? And; How can we reduce changeover time?” This is important because:

Traditional Measurement	Time Based Measurement
☑ Cost is the metric	☑ Time is the metric
☑ Look to Financial Results	☑ Look to physical results
☑ Utilization-oriented measures	☑ Throughput-oriented measures
☑ Individual measurement	☑ Team based measurement

“Dominant organizations continuously increase speed and consistently reduce cost by setting and attacking benchmark standards and by compressing time.”

Although cost is still the key measurement for organizations, Time Based Management is replacing traditional measures of efficiency, at least in the diecutting opera-

	Time is a more useful and a more accurate management tool than cost.
	Cost is normally a symptomatic, after the fact, lag indicator of productive efficiency.
	Time based companies reduce cost indirectly by compressing time.

tion. *See illustration above.* In terms of manufacturing improvement time is a more accurate tool than cost, as cost is normally a symptomatic, after the fact, lag indicator of productive efficiency. *See illustration above.*

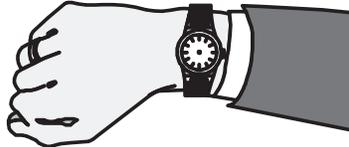
Achieving fast, precise, and predictable changeover is at once both the most important challenge facing a diecutting organization and the most telling benchmark in

The ABC's of Fast Diecutting Press Changeover!

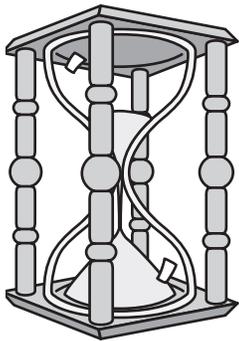
evaluating current performance.

Therefore, changeover is clearly a race against the clock, a drive to compress time, and a determination to execute the discipline as quickly as possible. However, the words precise and predictable are equally important. The make-ready sequence must be precise to ensure the production run delivers the highest yield, the lowest waste, and the best quality. In addition, every changeover sequence should generate better methods and more effective procedures to enable the work team to predict changeover time, with increasing accuracy.

It is vital to use time and time management as the primary tool to evaluate the existing system of manufacturing, to establish current performance benchmarks, and to assess changes in methods and practices.



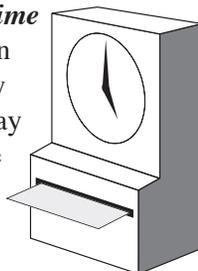
Once we have established time management as the most valuable management tool, the first task is to deal with the measurement of time, and the second is to define when the clock starts and the timer is stopped?



Every press should be equipped with a large digital clock, with multiple time zones. This should be easily accessible. Even assessed remotely using a hand held controller, and one or more time zones should have the ability to show an elapsed time countdown.

Each team member should be equipped with a digital stopwatch, and or provided with an inexpensive digital wristwatch. One of the most effective tools in this initiative is to use a video camera with a timer which will display on the resulting tape the elapsed time for the activity being recorded. This obviously provides both a time record and a step by step record of the activity being timed.

In the beginning, it is useful to set the camera up in a location which records the make-ready *“time & motion”* activity, without the distraction of a “camera person.” Several make-ready changeovers should be recorded in this way to establish the current practices, to create an initial unified method, and to define a benchmark time standard.



The accuracy and the validity of the time record would be severely compromised without a specific start and end point to each activity. Therefore, selecting a precise start point and a clear end point to each activity should be treated with the importance it deserves by the entire work team.

Establishing time management as an unambiguous, fair, and a universally understood system of measurement, is the first step toward building a more effective and a more efficient system of diecutting.

	Teach Time Management?
	Integrate Time based Measurement?
	Develop Time focused Benchmarks?
	Compete against Time?

Therefore, the first action requires defining the importance of this new discipline by teaching time management and integrating time based measurement, and the concepts of benchmarking to the work teams. *See illustration above.*

But how do we start and where do we start the revolution? The second action is to integrate Just-In-Time practices into the organization of the diecutting discipline.

What is Just-In-Time Organization?

“Never mistake motion for action.” Ernest Hemingway

It should be obvious by now that time is at once the most precious and the most volatile of all of the resources we have at our disposal. The saying; “Use it or lose it,” is so appropriate. *“Time is at once the most valuable and the most perishable of all our possessions”* John Randolph. But how do we use time as a tool in organizing a fast and effective press changeover? And what is Just In Time?

Manufacturing time management is often referred to as a Time & Motion discipline. As manufacturing is a labor-intensive process, the focus is on organizing and laying out work areas to maximize value added time and to minimize non-value added time. By measuring



travel time or motion between work areas, tools, and materials, we are able to position all of the essential equipment, tools, materials, and components in such a way the craftsman can complete each task with the minimal amount of unnecessary movement, and therefore, in the



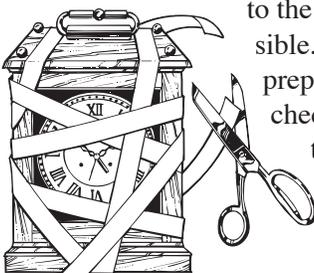
shorted time possible.

This approach is based upon using one tenth of a minute or six seconds as the basic time measurement. Reaching for and picking up a tool takes six seconds, as does taking a step, lifting a guard, or removing a sample from a work order envelope. These are all examples of six second actions. The goal is to reduce unnecessary steps, actions, or motion, to conserve time by gradually shaving blocks of time from every procedure, and to ensure every action adds value.



What is the difference between an added value action and a non-value added action? Value added actions could include positioning the female stripping tool, adjusting the front lays, patching-up, or laying counter plates or matrix. Non value added actions could include looking for the tool to lock and align the male and female stripping board, clearing a jammed lay adjustment, walking to retrieve a reel of patch-up tape, or clearing a clogged nozzle on the aerosol glue spray container. This does not mean to say some of these actions can be completely eliminated but the basis of fast make-ready is to first convert every on-press activity to an off-press activity.

The goal here is to changeover the press from one job to the next in as little time as possible. In the example above, if the preparatory inventory management checklist had been in place the tool for the female stripping board would have been positioned where it was needed, as would the reel of patch-up



tape. The aerosol glue container nozzle would have been tested after its last use, and before it was repositioned in its appropriate on-press location. Even the jammed lay adjustment should have been part of a changeover preventative maintenance checklist, and could have possibly been avoided. It is impossible to anticipate and eliminate every on-press failure; however, the goal of an effective on-press changeover organization is focused around converting as many on-press actions as possible to off press actions. In other words, while the press is running one job the next job is being checked and prepared, and on-press organization is being verified to ensure everything is ready for the imminent changeover.

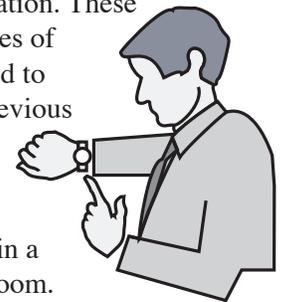


Think again of the emergency operating room in the hospital. The surgeon and his or her team do not wait for a patient or for an emergency situation to get organized, they prepare by pre-organizing each work area so they can concentrate on the patient and his or her needs when the emergency inevitably arises. In the diecutting operation the primary goal is to minimize press down time. By applying an identical approach the logical discipline is to organize the work area, the tools, and materials, and the actions of the operator to minimize time expenditure, and to standardize and simplify the procedure. How do we start?

The first action is to create the Just-In-Time Press Map. This simply requires drafting an accurate map or plan view of the press and the surrounding work area. This map should integrate a measured 12 inch squared grid in the background or superimposed over the drawing.

The second action requires defining the work areas on the press map in terms of individual disciplines or “*Work Cells.*” For example, the work cells would include the feeder, the feedboard, the platen stack, the stripping section, the blanking unit, the delivery or waste disposal area, and the Information work station. These are areas of the press where a series of actions and activities are organized to change the press over from the previous job to the format for the new job.

Then imagine you are working in one of these cells, as the surgeon in a Hospital Emergency Operating Room.



The ABC's of Fast Diecutting Press Changeover!



With minimal time, minimal motion, and minimal effort you can reach every tool, material, component, or piece of equipment which is necessary to complete the task in that area. Although there are critical application differences between the surgeon and his emergency team and the operator and his press changeover

team, they are both seeking maximum efficiency and share the determination to make the most effective use of the time available.

The third step requires completing an inventory checklist of every item used in press make-ready. This would include the dies, counters and stripping tools; all of the hand tools and equipment, all of the materials and supplies; all of the information required to complete changeover; all of the maintenance and cleaning materials, and all of the Work-In-Progress materials to be diecut.

The next logical action, the fourth step requires the positioning of every piece of equipment, every tool, every material, every piece of information, and every component in a permanent or a temporary storage location and clearly indicated on the press map, and easily accessible from each work center. At this stage it is also useful to develop a color-coded single source location system for every item. This will simplify retrieval, it will assist the team to memorize location and it will make the pre-press inventory checklist much simpler

The fifth step requires defining all of the procedures, tasks, and actions required to complete the changeover discipline in each work cell. For example, what are the procedures required in unfastening and removing a male and female blanking tool, and then replacing those tools with the next set of tools for the next job? Naturally, this would include the inventory management checklist to determine every tool,

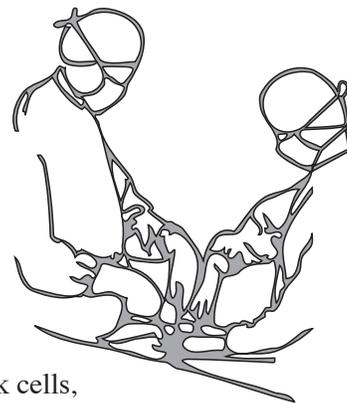


every component, every material, every piece of equipment, and every piece of information required to complete the task.

The sixth step requires creating a list of all of the procedures and their incremental sequence and choosing a priority to analyze, consolidate, and time current methods and practices. This approach to defining current procedures, developing a preliminary consensus, and then documenting the sequence of steps and actions, should include the measurement of elapsed time and activity time.

The seventh step simply involves videotaping each complete sequence of the specific activity the team has decided to focus on. These videotapes of actual changeovers are then analyzed by the work teams to brainstorm and determine better methods and practices, a more effective layout of tools and materials, and ways to simplify and compress the time expended in the activity.

The eighth step requires following the practice of “Closing-the-Loop,” or using every production cycle as a means of solving a specific problem, fine tuning the layout, modifying procedures, eliminating an obstacle, modifying the tools, or changing team procedures. The goal is to “learn” and to use the knowledge gained to organize the work area, the work cells, the tools, and materials, and the work team, to minimize unnecessary non-value added activities, and to continually reduce the time to complete each key task.



The same discipline can be applied to the activities of the entire work-team, and the role they play in the changeover activity. It should also be obvious that for this system of manufacturing to work effectively, every team member has to accept the discipline of standard operating procedural consistency. And of preparing and maintaining the presswork cells or areas in optimal operating condition. And finally, by sharing their knowledge, ideas, and suggestions, to improve the performance of this Just-In-

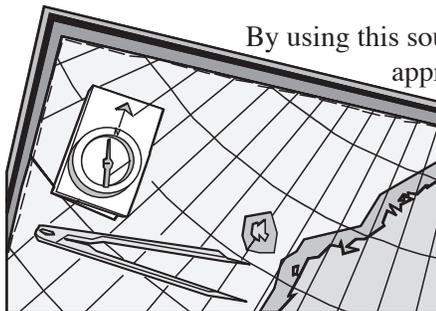
Time Work System.

The ninth step requires developing a consensus about the most effective method of executing a specific procedure, documenting the sequence, and then videotaping its execution several times to develop a basic benchmark time standard for the activity. With a consensus about the procedure, the next step would be to train and certify every team member in the execution of each specific approved SOP.



Consensus Building!

The tenth step is the continual focus of the work team on procedural uniformity, and in developing the most effective and efficient method of consistently executing each key procedure. This is easier than it sounds because the previous system of manufacturing, although inconsistent and inherently variable, did allow each craftsman full autonomy. It is vital to tread lightly through this integration of the best of the best, and to proceed with patience, respect, and tolerance.



By using this sound organization approach, we build a foundation upon which to design and create a highly effective, sustainable, fast flow system of diecutting manufacturing.

To summarize, the Ten Steps in Creating a Just-In-Time Work System are:

- 1: Create the Just-In-Time Press Map**
- 2: Define On-Press Work Areas or Cells**
- 3: Create a comprehensive Inventory Checklist**
- 4: Create a permanent location for every item**
- 5: Define all of the procedures for each task**
- 6: Prioritize the procedures, developing a consensus**
- 7: Videotape current procedures & time execution**
- 8: Develop team closeout brainstorming disciplines**
- 9: Restructure & benchmark each procedure**
- 10: Teach, train, & videotape procedural uniformity**

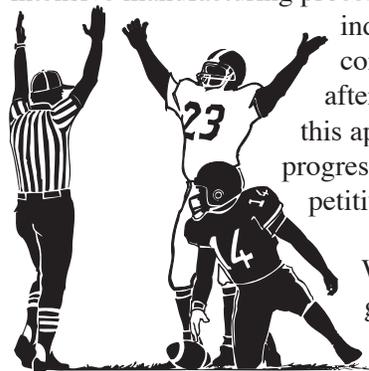
The Just-in-Time organization approach is essential to maximize press make-ready efficiency, however, it is important to recognize it is a system of manufacturing

which integrates the best ideas of everyone involved and is based upon a team approach to press changeover. But what does Team Changeover mean?

What is Team Changeover?

“Most groups like stability. People work better with methods, procedures, and equipment they understand. They are more comfortable if they know what is going on. They dislike being in the dark. People who are comfortable and stable have healthier emotions and sharper minds.” Donald G. Krause

Why are teams and teamwork universally recognized as the most critical ingredient for any effective, labor intensive manufacturing process. Because industry after industry, company after company, and application after application, have proven this approach enables the fastest progress toward sustained competitive excellence.



What are typical team goals in manufacturing? These may include:

- ➔ **Increasing and consolidating productive output**
- ➔ **Improving the quality of the diecut product**
- ➔ **Building an effective and balanced work team**
- ➔ **Improving methods and procedures to reduce costs**
- ➔ **Working with customers and suppliers to improve quality**

Therefore, diecutting converting is a perfect application where the use of teams will significantly improve performance. But what is a team?

A team is a group of people who come together to achieve specific performance objectives. An effective team is a dynamic force, which is constantly changing and evolving, as team members define objectives, brainstorm ideas and solutions, make decisions, increase knowledge and skill, and take action together to achieve a shared goal.



The ABC's of Fast Diecutting Press Changeover!

A team is a group of people dedicated to the success of every other team member, to the success of the defined objectives of the team, and to the success of the entire organization. A team is a group who share their knowledge, skill, and experience, to build performance parity



and procedural uniformity. A team is essentially a social organization who take pride in their identity, and who work for each other as they strive for a unified vision of success.

An ineffective team environment or an organization built around individuals, working alongside each other, with variable skills, poorly defined objectives, and no sense of a common purpose, are at a severe competitive disadvantage. Poor teamwork results in:

- ➔ ***Uneven knowledge, skill, and experience***
- ➔ ***Poor task sharing and cooperative problem solving***
- ➔ ***Slower training and skill development***
- ➔ ***Poor performance, lower productivity, and higher costs***
- ➔ ***Greater management control & discipline complexity***
- ➔ ***Inconsistent quality and productive output***
- ➔ ***Poor work planning and inconsistent output***
- ➔ ***Slower process improvement and innovation***

Why is building a team approach to diecutting press changeover the only effective option? A team will create unity; focus and direction; efficient simultaneous processing; faster learning and seamless cross training; a safer working environment; more comprehensive observation,



analytical, and brainstorming capability; and an instinctive competitive fire.

In addition, the sense of identity, respect, and sharing will encourage personal responsibility, enthusiastic participation, increase energy, and finally, these positive, progressive working conditions will build commitment to the common goal.

So, What would a Typical Team Changeover Look Like?

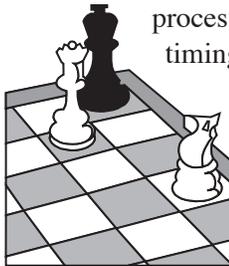
“Could we change our attitude, we should not only see life differently, but life itself would come to be different. Life would undergo a change of appearance because we ourselves had undergone a change in attitude.”

If we were to observe a typical changeover, in a typical day in an organization which has recognized the singular importance of the



press changeover discipline, we would have to begin in the Production Scheduling Office. In walks our Fast Changeover Facilitator, Bill. He is not a department Supervisor, and although he has wide-ranging powers, his only focus and his only duties are fast press changeover, team training, and process improvement.

He checks the schedule board for all of the press changeovers planned for the diecutting department for the day. He is using a clipboard, with a pre-formatted computerized daily changeover-planning sheet. His next stop is the Printing area, where he verifies the status of the work-in-progress and makes changes and notations on his planning sheet. He then visits the toolmaking/pre-press area where he verifies all of the tools for all of the changeovers are ready and approved for production. He makes his next stop in the diecutting area, and checks work-in-

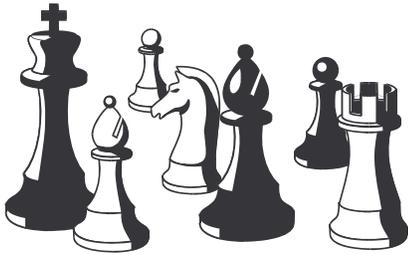


process status, and determines a preliminary timing for each changeover.

He checks with the Printing, Diecutting, Diemaking/Pre-Press, Finishing and Maintenance department supervisor's to determine the team

members who are available to participate in the days changeover schedule. His next stop is the Pre-Press or Staging area, where he amends the large planning white board, which has a series of details and visual symbols, representing the next 48 hours in the life of the diecutting department. The visual planning/white board uses symbols to make sure the next 15 production jobs have every key ingredient, for every job, in the right place, for the current schedule.

He prints out the one-page job planning sheets for all

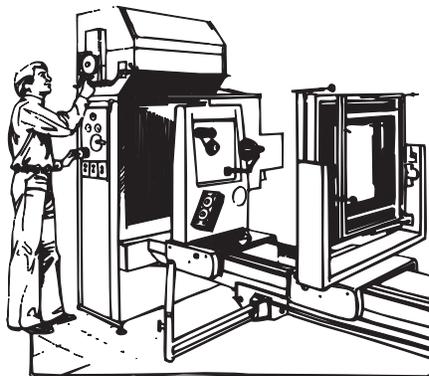


of the jobs planned over the next 48 hours, and begins executing a pre-planning checklist for each job. He checks the commercial and technical data, before

completing an inventory management checklist of all of the tools, materials and components are in place and ready for press changeover. He checks each press in-turn to verify that all of the hand tools, materials, components, parts and equipment are in place for the next make-ready.

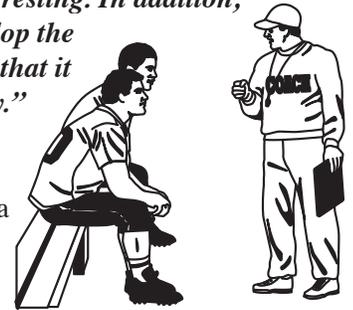
As a press is completing the last load of the last job, Bill activates a signal horn and a flashing red light, which is prominently displayed over the diecutting press. This is a signal to indicate the next press changeover will be in 15 minutes. During this period his Pit Crew Changeover Team Assembles. The changeover plan he uses is flexible and is designed for a 1, 2, 3, or 4 man teams. 3 team members turn up and they are handed a job information sheet to review.

There is a short discussion to allocate responsibilities and to coordinate activity. The specific focus of this make-ready is discussed, and the current benchmark changeover time stan-



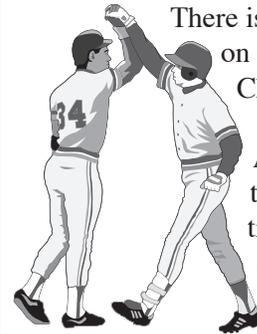
dard and productive yield history for the specific job and for this press is reviewed. *“Rotating people and letting them work in different assignments is an excellent way to keep a person’s work interesting. In addition, it serves to enrich and develop the employees’ skills. It’s a pity that it isn’t practiced more broadly.”*

Andrew S. Grove



Each team member collects a tool belt with all of the hand tools and supplies necessary for press changeover. They fit a large digital stopwatch, two-way communicators and a tape recorder to their coveralls. The front of the press already has a large digital timepiece with two displays. One for elapsed time and one for a countdown, using the current benchmark target. The focus of this press changeover is on feeder set-up, so a remote video camera is set up to record the actions of the team for later review.

There is also a Pareto Analysis Chart set-up on the press for Male Stripping Tool Changeover.

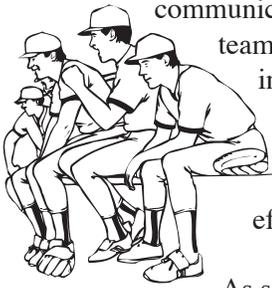


As the press stops the press operator activates the digital countdown timer(s), removes the final load, and completes a written job close out using a pre-prepared checklist. The changeover team purge the area, restock any missing items, and quickly verify everything is in place. The old tools are removed and set in a staging area and the new tools are inserted and locked into position. The press operator has the first load ready at the feeder, and the press-set-up sequence begins. During the make-ready sequence, depending upon team strength, one of the team will execute a progressive preventative maintenance checklist, and complete a limited number of maintenance, cleaning and housekeeping duties, using a prepared progressive activity checklist.

The cutting make-ready is complete, sheets are advanced through the press, and final adjustments are made to tools and to press settings. It is obvious to an observer this is a well-organized, systematic, thoroughly practiced, and superbly executed sequence of actions. The team is flexible, adaptive, and each one knows their role for this make-ready, they understand the sequence of actions, they know their tasks, they are highly sensitive to safety and close out issues, they



The ABC's of Fast Diecutting Press Changeover!

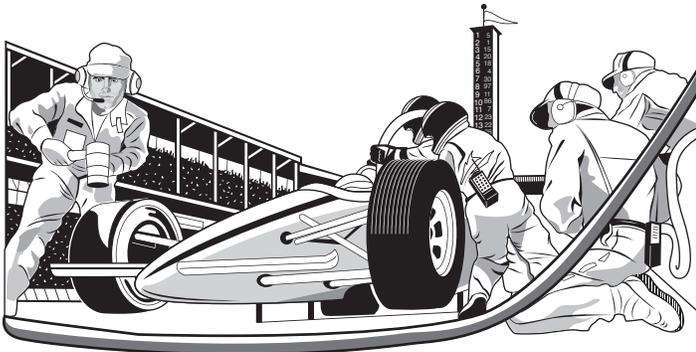


communicate continually, and respect each team members role. When there are inevitable technical problems or issues, they quickly assemble and use their combined knowledge and experience to determine effective remedial actions.

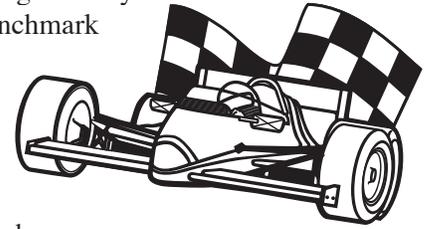
As soon as the first sheet is diecut, one of the team members concentrates on quality control and making sure the diecut products conform to customer requirements. When the press commences production one of the team members assist the operator in tuning to get the press up to optimal speed, and in further checking of quality. Another team member completes an inventory management checklist, lists any missing items from the changeover, and gives the checklist to Bill.

Each changeover team member makes a suggestion for a minimum of one improvement in any aspect of press changeover to Bill before they leave the area. Bill completes an analysis, using a check-sheet to record man hours, elapsed time, problems and issues, changes and upgrades, and he interviews the press operator to get a final closeout.

What is Bill looking for? Better information, better inventory management, better tooling, better set-up procedures, better team work, better communication, better training and problem solving, better just in-time organization, and obviously better productivity and quality. The focus is clearly to execute the fastest, most effective changeover possible, but the primary objective is education. The only way we can improve is by determining where we are now, defining better or alternative methods and procedures, measuring results, and making incremental changes.



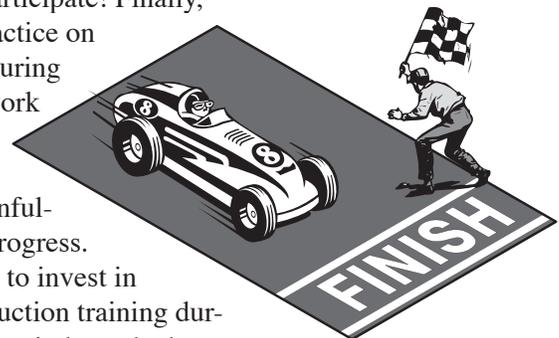
This description is obviously similar to the actions of the Indianapolis Pit Crew. Do you think they achieved the extraordinary performance they regularly demonstrate by accident? Of course not, the secret is practice & analysis, practice & analysis, practice & analysis, and competing against progressively more competitive benchmark time standards. How do your teams practice, how do they measure performance, how do they improve, and how is changeover organized to make progressive improvement a daily reality?



If you stood in the center of the Pit, on the Press, would every tool, every component, every material, every piece of equipment, every supply, every piece of equipment, be within arms reach? And if not why not? Would every tool, component and part be in a color coded, single source location, to ensure consistency from changeover to changeover, and from person to person? Every step every person takes consumes 6 seconds, and every step every person takes which does not add value, is adding time waste and man hour cost!



Every changeover, in every department is critical to the competitive survival of the company. Therefore, involve everyone in the process to ensure a total operational focus on this critical activity. Everyone can and everyone should participate! Finally, if you practice on the job, during normal work hours, you will make painfully slow progress. You need to invest in non-production training during slow periods, and when necessary during weekends.



Can you imagine a top flight Indianapolis Race Team using novices and untrained participants to practice changeover during a race! Our approach to the key discipline of productive converting is unprofessional, it is

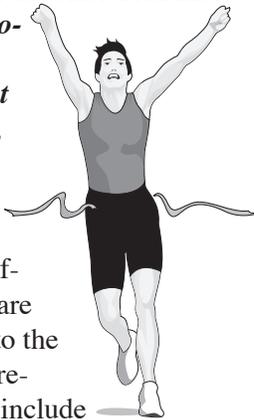
unpredictable, and it has little chance of improvement. *“Great thoughts reduced to practice become great acts.”* William Hazlitt



How is Changeover Performance Measured?

“No experiment on performance should be undertaken without clear, explicit and reasonable goals----unless the experiment is designed to measure the effect of unclear, implicit, or unreasonable goals.” Gerald M. Weinberg & Edward L. Schulman

It is important to agree upon a definition of what press changeover is. *“Press Changeover is the time consumed from the last quality diecut sheet produced from the previous job; to the first sheet of quality/approved diecut work produced at production speed, from the second job.”*



This definition of press make-ready would seem to reinforce the many different types of measurement, which are legitimately and effectively applied to the changeover procedure. These measurements of operating efficiency would include the following:

- ➔ *Elapsed Time?*
- ➔ *Total Man Time - Man Hours?*
- ➔ *Press Speed & Yield?*
- ➔ *Meeting Customer/Supplier Deadlines?*
- ➔ *Total Cost per Product?*
- ➔ *Total Process Cost?*
- ➔ *Speed to Market?*
- ➔ *Cycle Time?*

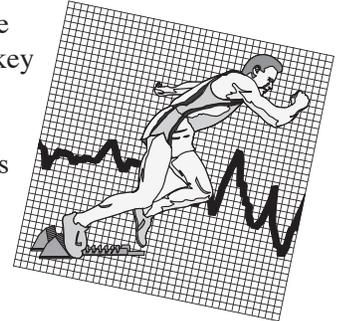


All of these essential measures are focused on Time, Cost, and ultimately, Productive Output. These are integrated with more immediately tangible measures focused on technical, but equally important issues, including:

- ➔ *Converting Quality Control?*
- ➔ *Material, Resource, and Waste Management?*
- ➔ *Performance of Diecutting Tooling?*
- ➔ *Performance of Tool Parameters?*

- ➔ *Performance of Tool Materials?*
- ➔ *Performance of the Changeover Team?*

Every one of these measures provides important information, but ultimately, all of these information systems are designed to accomplish one key transformation.



They are designed to make you smarter, better, and faster.

One of the important goals of each changeover, is to use measurement, evaluation and analytical tools to learn more about the process, to solve problems, and to be able to make adjustments to the system of diecutting changeover.

Are we a more effective changeover team as a result of the experience we shared? What did we learn? What will we change? How can we improve the next press changeover?



Diecutting Manufacturing is about Education. The different types of measurement systems are simply tools to improve our individual and team

performance.

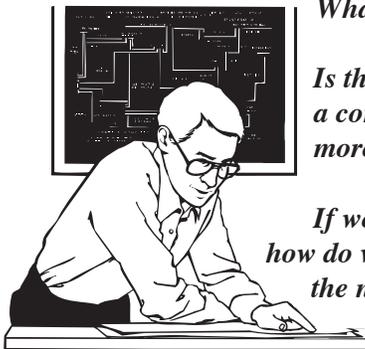
What is Closing the Loop?

“How often have I said to you that when you have eliminated the impossible, whatever remains, however, improbable, must be the truth?” Sherlock Holmes

If education is a key outcome of each changeover, how do we find, purge and evaluate what is important, what is better, and what we can all agree upon? The answer is *Closing-the-Loop.*



This requires a simple, focused, and determined effort to capture new ideas, to upgrade procedures, and capture solutions to problems. It has to be simple, it has to be fast, and it has to be practical, because manufacturing is also a race against the clock, and the clock is always ticking! However, if there is time, and occasionally there is sufficient time to conduct a more detailed and more intense process postmortem, this would be a great opportunity to maximize the educational benefit.



What did we learn?

Is this bullet proof, is there a consensus, or do we need more research?

If we need more research, how do we focus on this issue in the next changeover?

If the idea is solid, how do we change procedures and methods to integrate the new knowledge?

But even if there is only a few minutes, there is time to ask and answer some simple questions. What is one thing you learned from this make-ready, that we can use to improve the next changeover?

Progressive change is simply that. It is progressive, it is incremental, and it could be faster, but steady change, even small change accumulates to improve performance.

If every team member came up with one idea per make-ready, imagine how far we would have progressed over the past year? Closing-the-Loop is simply a learning cycle? And knowledge is power!

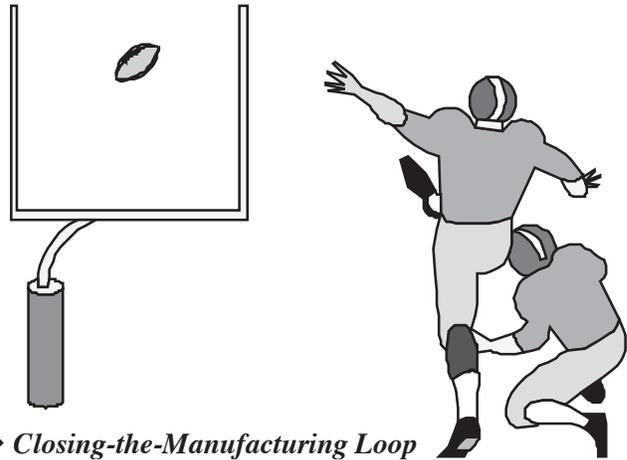


Chapter Summary?

“Knowledge and timber shouldn’t be used till they are seasoned.” Oliver Wendell Holmes

In considering the Key Dynamics of Press Changeover we considered the following disciplines:

- *Personal & Team Safety***
- *Inventory Management & Organization***
- *Standardization on the Best of the Best***
- *Using Measurement Systems to Learn***
- *Focus on Activity & Elapsed Time Benchmarks***
- *The Power of Just-in-Time Organization***
- *The Benefits of Simplification***
- *The Core Value of Team Education***
- *The Importance of Team Work & Team Building***
- *The Insight gained from Testing & Research***
- *The Importance of Information Management***
- *The Advantages of Work Planning***



→ *Closing-the-Manufacturing Loop*

We considered the goals of press changeover, which could be summarized by: ***“To find the safest, the fastest, the most effective, and the lowest cost methods of achieving a productive press set-up.”***

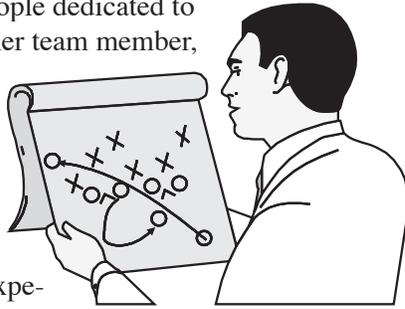
In answering the question: ***“What is Time Management?”*** We answered by recognizing Time as the most valuable and the most volatile resource, which is the basis for cost, performance, and productivity.

In assessing Just-In-Time Organization we recognized the elegant simplicity, the efficiency, and the reduction in fatigue, when working in a well organized, incrementally improved work space.

When we asked the question: What is Team Changeover?

We answered by defining the benefits of teamwork, to provide the following definition.

A team is a group of people dedicated to the success of every other team member, to the success of the defined objectives of the team, and to the success of the entire organization. A team is a group who share their knowledge, skill, and experience, to build performance parity and procedural uniformity. A team is essentially a social organization who take pride in their identity, and who work for each other as they strive for a unified vision of success.



We asked; *“What would a typical team changeover look like?”*

If you were observing a team changeover, the words team, focused, flexible, cooperative, competent and seamless would come to mind. It is like watching a double play in baseball; an intricate and fast flowing passing sequence in basketball, or perhaps a highly effective volleyball team. It is not that the unexpected will not happen, but the team has practices and are ready to turn a disadvantage into an advantage, and a crisis into a demonstration of effective teamwork.



We asked; *“How is Changeover Performance Mea-*



ured?”

In examining the measurement criteria applied to press changeover we considered measurement of efficiency, including elapsed time, speed, and productivity. We considered measurement of effectiveness, including quality, waste, and tool performance. However, our conclusion was the most important measurement in press changeover, was the value of the knowledge we gained from the experience, and how significantly we could use this information to improve the next make-ready sequence.

And finally we asked: *“What is Closing-the-Loop”*

In assessing the closing-the-loop discipline we focused on a fast, simple but effective method, to gain all of the new knowl-



edge, new solutions and better methods, from all of the team members. We recognized that if we only improve one thing every make-ready, we would get better and better, make-ready to make-ready.

The most important strategic decision is to survive! In the final analysis every manufacturing operation is competing with every other manufacturing operation, in every part of the world. Communication and transportation have made the world a much smaller place. Every diecutting company is competing against every diecutting company. Every changeover team is competing with every other changeover team, in every company. And each individual crafts person or technician, is competing with every other technician, in every other company.

In practice, every one of us can make a difference, we can have an impact on the team, we can have an impact on performance, and we can have an impact on the productivity of the organization.

Survival depends upon maximizing the productive potential of all of the resources at our disposal. Achieving World Class performance is no longer an imaginary benchmark, but it is an absolute necessity for the survival of our company and our industry.

Chapter 2:

What are the Key Dynamics of Diecutting Press Changeover: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ Protecting your safety and the safety of your colleagues is the most important requirement of being involved in the manufacturing process.
- ✓ The standardization of tasks and activities, and the search for the best operating procedures and practices is a foundation principle for the professional craftsperson.
- ✓ Teamwork, training, and education, and sharing ideas, techniques and solutions, are vital to our collective economic survival.
- ✓ Time is the most volatile and the most valuable resource at our disposal, and time management, benchmarking, and Just-In-Time organization are the tools we use to maximize our efficient use of this resource.
- ✓ The goal of changeover is to 1, complete the changeover as quickly as possible, and 2, to make the press ready with such precision, productive output, and diecut part quality are consistent from the first impression to the last impression.
- ✓ Work areas should be organized with the same focus, intensity, and attention to detail you would expect in a world class hospital emer-

gency room.

- ✓ Recognize the advantages of teamwork and the ability to execute fast and stress free press changeover, using the principles and practices of a NASCAR Pit Crew Team.
- ✓ Commit to personal education, research and sharing knowledge, ideas and innovation. Empower the team and you empower the individual. Teams learn faster and gain competence more rapidly than any one individual.
- ✓ Measure the process and continuously update performance benchmarks. In manufacturing it is a key principle, that if you are unable to measure a process or an activity, you are unable to manage it!
- ✓ Continuously practice the discipline of closing the loop. Ask simple questions? What worked well? What worked badly? What do we need to change for the next cycle?
- ✓ Put the needs of the team and your colleagues above your own, and work as hard as you can to improve performance and to improve teamwork.

Chapter 2:

What are the Key Dynamics of Diecutting Press Changeover: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Does your organization utilize a systematic approach to ensure every tool, component or part is in the right place, in the correct quantity, and in optimal working condition prior to each press changeover?
- ✓ Who is responsible for press changeover Inventory Management, and/or how are current inventory levels verified and maintained, from make-ready to make-ready?
- ✓ Is there a “standardized” method of press changeover and set-up established, reviewed and regularly upgraded?
- ✓ How do you use Time Management & Just-In-Time principles to measure activity efficiency and to organize key work areas?
- ✓ Is the system of diecutting manufacturing built around teamwork, and does the organization recognize, foster, and promote the advantages of team building?
- ✓ How is performance measured, and how are these measurements used to upgrade current benchmarks and to set goals to improve the process?
- ✓ How often does the press changeover teams get together to analyze the process, to discuss more effective methods, and to recommend changes to be tested?
- ✓ As manufacturing is about the movement of information and material, how is key information captured, processed, and redistributed to everyone involved in press changeover?
- ✓ As manufacturing is about the movement of information and material, how is data collected, evaluated and used to improve paperboard knowledge, and to change key tooling parameters?
- ✓ Is there an awareness, throughout the organization, of the strategic implications and economic consequences of poor performance?
- ✓ How is team or individual achievement recognized and rewarded in the current system of manufacturing?
- ✓ Is there a consistently applied system of work planning used to improve pre-press organization and to press changeover?
- ✓ Is there a consistently applied system of process evaluation or closing the loop used to improve subsequent pre-press organization and to press changeover?

Chapter 3:

Project Management: Manufacturing Organization?

Robert Hall

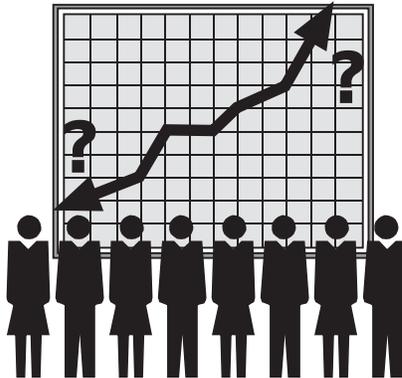
Fast Press Changeover: Introduction

“One way to increase productivity is to do whatever you are doing now, but faster..... There is a second way. We can change the nature of the work we do, not just how fast we do it.” Andrew S. Grove

The greatest challenge we face in successfully implementing this program is in our ability and/or in our willingness to adapt to continuous daily change. And for many, what is initially even more unpalatable, is a commitment to accept change dictated by a team consensus.

Fortunately, we have a good team in place and they have demonstrated their knowledge, their skill and their ability to execute diecutting converting. What we must do is develop a stronger team, with greater parity, with better information, and with a more effective operating structure.

In reality, the basic ingredients for a World Class Manufacturing Operation are already in place. We simply have to change the recipe; by weighing and adjusting the constituent parts; by stirring and agitating the mix thoroughly; by recording the way we bake the cake; by evaluating the results, and by applying the lessons we gained from every baking session.



The majority of the time the most critical missing ingredient is discipline. You have surely heard the quotation; *“Too many cooks spoil the broth.”*

This is an exact description of our current dilemma. Everyone is doing the same task in different ways, even to the extent of doing it differently each time! This is indeed a recipe for disaster, or as we experience, a recipe for variable performance.

It is essential to sift through all of the different methods and to create a unified, team recipe, for diecutting-converting.

Which brings us full circle to the opening statement of the introduction.

The greatest challenge we face is in our willingness to compromise, to share our knowledge without reservation, to listen respectfully and carefully to other team members, and to endorse, and to enthusiastically, and to fully support the current consensus approach.

Fast Press Changeover: Goals & Objectives

“Most organizations, left to their own devices, are going to atrophy, to get so institutional, so bureaucratic, that they get to the point where their original reason for existence has been lost, and they stagnate. So you have to change, and by that I mean dramatic change.” William G. McGowan

The primary goal is simple and direct. Our goal is to reorganize the current system of manufacturing to transform diecutting press changeover into a fast, consistent and effective discipline.

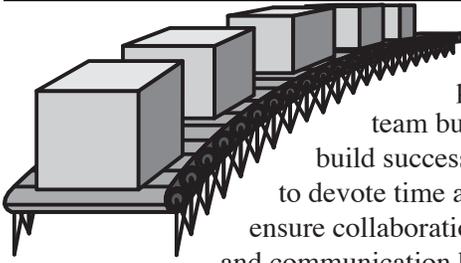
We already have a system of manufacturing in place. However, it is not achieving the potential it is capable of.

The secondary goal is to create and develop an effective team. With a genuine team effort, everything is possible. The stronger the commitment to teamwork, the faster the work teams will learn, the more rapidly they will develop, and the more likely they are to succeed.

It is however, important to remember in any activity, building a unified and focused team is both the most difficult and the most important of tasks.

With a good team foundation in place, knowledge, skill, and experience are secondary to a positive attitude.

The ABC's of Fast Diecutting Press Changeover!



member of the team.

It is also essential to have visible and ongoing support and leadership for the project and for the team, from and through every level of management. This is where the battle will be lost and won. ***Be prepared for casualties!***

Your top crafts person may decide they are not prepared to fully participate. And rather than finding yourself backed into this difficult situation, it is vital the groundwork is gradually and carefully put in place in this project, to minimize surprise, to eliminate confrontation, to allow good sense to prevail, and to build support.

This type of situation will only occur when an individual or a number of individuals see this project as another failed initiative to improve. However, if it is strongly endorsed by the management team, and the management team get involved and stay involved, opposition will inevitably crumble, and common sense will prevail.

Fast Press Changeover: Why are Current Methods & Practices Ineffective?

“That’s what learning is, after all; not whether we lose the game, but how we lose and how we have changed because of it and what we take away from it that we never had before, to apply to other games. Losing, in a curious way, is winning.” Richard Bach

The answer is plain for everyone to see. We certainly have current methods and practices, but they are different from crafts person to crafts person, they are applied inconsistently from job to job, they are applied erratically from day to day, and there is no documented evidence of a standard approach!

If standard methods and practices are consistently used, each production cycle will generate new performance data, which makes continual adjustment and improvement simple and straightforward.

In this project, it is essential to put teamwork and team building first. To build success, it is essential to devote time and resources to ensure collaboration, cooperation and communication between every

If non standard and variable methods are employed, each production cycle will still generate new performance data, however, with a lack of a standardized approach, the relevance of the data is missed, and even if it were collected, how would it be productively used?

In a direct reflection of the disorganization of current methods and practices, every production cycle will be variable, unpredictable and difficult to plan for. Each production cycle will be complex to execute, impossible to control, and extremely difficult to gain knowledge and process improvement benefit.

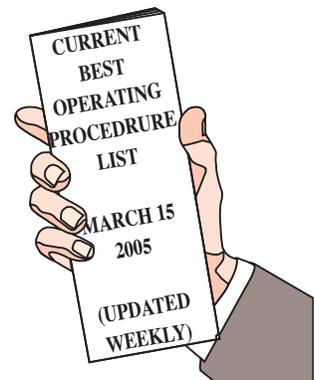
If every member of the team were using the ***Current Best Operating Procedure***, then the experience of every team member can be focused from every production cycle to update the current standard. (The term Current Best Operating Procedure is a far more accurate reflection of the real world than using the term Standard Operating Procedure, because as soon as any standard is benchmarked, subsequent execution of that standard procedure will generate new information to change and improve the standard!)

But what happens if there are no approved standards, no current benchmarks, and no systematic method of continuous improvement? Not only is this approach less effective, it actually isolates each individual so they are unable to contribute their recent experience, and they are unable to gain the benefit of everyone involved.

To accurately answer the questions posed by this section of the manual, why are current methods and practices ineffective, it is because there are no approved standard methods and practices.

If we employed a systematic, team driven consensus approach to any key activity, we would make daily progress and at an extraordinary rate.

Why does it take so long to train a viable candidate to become an effective diecutter? Because the organization and the people the trainee must learn from, use different methods from person-to-person, from job-to-job, and from day-to-day. Can you imagine how frustrating and confusing this is?



Using standardized, bench marked, consistently applied, documented and preferably videotaped procedures, it is possible to train a world class diecutting technician in weeks rather than years!

The problem we have is there is a lack of teamwork, a lack of focus, a lack of education, a lack of discipline, a lack of humility and a lack of leadership.

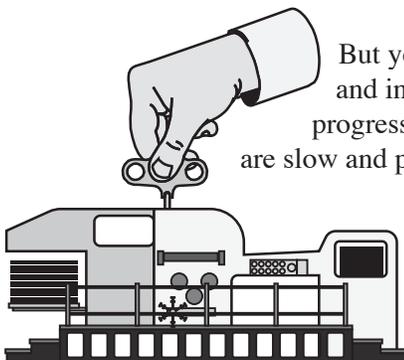
Instead of daily improvement we turned a simple process into an extraordinarily difficult task! Given the dynamic of the current employment market, we may only employ someone for a year or less. This means we have to train them in less than a month to gain the productive value of the investment in the individual.

And if the job is less stressful, more rewarding, more interesting, and more enjoyable, it may be the employee will indeed become a long term team member.

Fast Press Changeover: A Comprehensive System of Diecutting Manufacturing

“Change means movement. Movement means friction. Only in the frictionless vacuum of a nonexistent abstract world can movement or change occur without that abrasive friction of conflict.” Saul Alinsky

While meticulous and careful organization of this project are an advantage, the most important decision is to get started and to keep going! Eventually, by a process of elimination the team will reorganize and update every key method and practice. There will certainly be setbacks, there will be difficult challenges, and there will be times when production volume pushes the project onto the back burner.



But you must stay on course, and insist on making daily progress, even if the advances are slow and painful.

This is a difficult challenge. But not because of diecutting converting or the technical

complexity of manufacturing, it is difficult because of the challenge of creating, organizing and sustaining a team effort. You will be dealing with a diverse group of people, from the novice to the expert, from the introvert to the extrovert, from the flexible to the intractable, and from the cooperative to the highly resistant.



Many companies launch impressive improvement initiatives, but few finish the course.

The bottom line is blunt, cruel, and honest. If you start, finish. Starting and giving up is worse than not starting at all. The most important discipline to bring to this project is a determination to complete the project.

Improve the diecutting process step-by-incremental-step. You must lead and you must lead by example.

To survive in this industry, let alone prosper and succeed, it is essential to make daily productive gain in terms of team building, knowledge generation, productive improvement, quality enhancement, process simplification, and cost reduction. Realistically, it is not possible to make progress in every area on every day. But every step is progress and every step forward moves the team closer to the goal.

Be positive, be patient, but most of all, be persistent.

Fast Press Changeover: Plan of Action

“We emphasize that we believe in change because we were born of it, we have lived by it, we prospered and grown great by it. So the status quo has never been our god, and we ask no one else to bow down before it.”
Carl Rowan

The Fast Changeover Program is divided into two logical sections. These are:

*** Manufacturing Organization**

*** Technical Management**

Both areas of change are important. Unfortunately, the industry track record is to concentrate on solving im-

The ABC's of Fast Diecutting Press Changeover!

mediate technical challenges and failure, which certainly demand an energetic, fast response. However, without a matching and a solid organization structure in place, technical mastery is insufficient to build and/or to sustain a consistent high-performance organization.

The two disciplines are complimentary to one another. While performance variation in productive output, quality, waste and cost, are generally attributed to technical issues, they become persistent failure, because of poor process management and organization.

The first part of the manual is devoted to the key disciplines of building or upgrading to an effective Manufacturing Organization; and the second part of the manual, is devoted to upgrading and improving technical prowess.

Two key principles underpin this approach to process improvement. The first is the Mission Statement of every one involved in every type of manufacturing. This is:

Safety-Speed-Quality-Cost

The graphic shows it as a closed loop of activity, and this is important as it suggests and demonstrates the gain in knowledge and expertise from every production cycle, or closing the loop.



The first step in the mission statement is ***Safety***.

This is a recognition, that the most important discipline and requirement of everyone involved in the manufacturing process, is to concentrate on protecting their own and their colleagues safety. This is accomplished by taking personal responsibility to create and to sustain a safe working environment. In addition, this first step of the mission statement stipulates that any change, any upgrade, or any alteration to current procedures and practices, must be evaluated through the filter of personal safety.

The second step in the mission statement is somewhat controversial, because it is ***Speed***.

One of the great mistakes in manufacturing is to train by stating to the trainee, that quality is the most critical requirement of the process, and when they have learned to execute the task they are being taught, they can develop speed later.

Training is behavior modification or behavior development.

If you develop behavior in a specific task at a specific speed, then it is extraordinarily difficult to break the learned behavior, and do the task much faster! Obviously, a trainee does not have the skill to execute most tasks at full speed, however, by establishing time targets and benchmarks at the start of each training session, the speed outcome and performance requirement is clearly established.

The third step in the mission statement is ***Quality***.

This is generally and erroneously applied to the product and product material, and not as effectively to the process. Quality is predominantly a training issue, and a quality failure frequently stems from a failure to properly or consistency execute the correct method, practice, and procedure. Just as Safety and Speed, Quality must be integrated into every manufacturing activity.

The fourth step in the mission is ***Cost***.

The goal of an effective diecutting converting organization is to become the lowest cost manufacturer in the industry. And while cost control and management is critical to success, cost measurements have the disadvantage of being lag indicators, as they represent a post process analysis.

As our focus is upon shop floor improvement and control, we examine cost from a time consumption focus. The advantage of focusing on ***Time*** primarily rather than ***Cost***, is ***Time Measurement and Time Management***, provide immediate feedback to the work teams, and are a more accurate and a more precise indicator of performance efficiency.

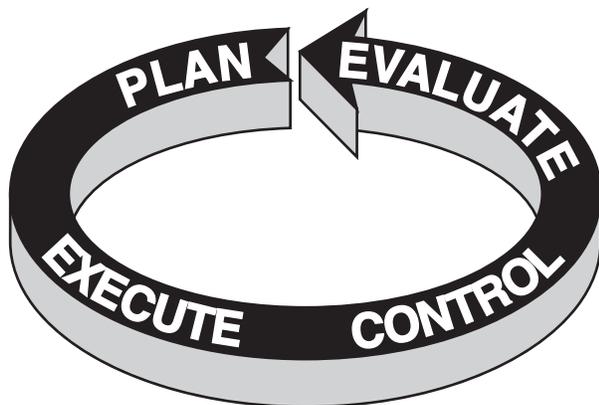


This by no means suggests that cost is not an important measurement tool in manufacturing, as it is a key success benchmark. But because manufacturing is a fast moving process, the use of time as the key measurement is the simplest and the most powerful management tool, to measure performance as it happens. The feedback is instant, unambiguous, and a powerful indicator of the source of a problem.

The second key discipline underpinning the Fast Press Changeover Program is the Planning and Execution Cycle. This closed-loop of activity also contains four key steps. These are

Plan-Execute-Control-Evaluate

This discipline exists in many similar forms throughout manufacturing, but the message is consistent, it is simple and it is fundamental to success.



This states we plan a task of action; we execute in a consistent manner; we attempt to control the actions and the outcome; and finally, but most important, we evaluate the process to determine how well we did and how we can do better next time. This is more simply defined as: *What* worked **Well**; *What* worked **Badly**; and *What* do we need to **Change, Next Time**?

This is often referred to as ***Closing-the-Loop***. The consistent execution of this type of close-out is critical because no matter what happens during each production cycle, we can learn something new. Every production cycle provides more information about the process, the product, the work team, and ourselves.

Manufacturing is a controlled experiment, a research project, a race against the clock, and an education opportunity. If we fail to capitalize on the problems, the causes,

and the solutions generated by each cycle, we miss the road map to continual improvement and we progress slowly.

Now let us examine the Manufacturing Plan and what it entails.

Fast Press Changeover: Program Implementation

“Things do not change; we change.” Henry David Thoreau

There are 25 components or disciplines involved in the organization of an effective system of diecutting management and control. The areas to be focused upon are prioritized in a manner which reflect their relative importance, if a system of manufacturing were being built from scratch.

Obviously, every diecutting-converting company has these disciplines in place, in one form or another. Some will be well organized and applied consistently, and others will be poorly organized and inconsistently applied.

Each company should first conduct an assessment with each work team to discuss how their organization stacks up against each of these items. Do we have a Training & Skill Development Program and how effective is it? Do we have effective measurement systems in place? Are we using teams in press make-ready and changeover, and how effectively are they organized? Etc.

The goal of each company is to assess their own operation, evaluate what disciplines are missing, which disciplines are in place but are working poorly, and which disciplines are well established and operating well. It is also useful to prioritize the 25 disciplines in terms of how important they are to the organization in the short term and over a longer period of time. It is possible your company has limited time to improve performance, and therefore, you may choose one or two disciplines to attack immediately. You may choose a ***“Pay as you Go”*** system. This simply means attacking those issues where you can have the greatest productive impact in the shortest amount of time. The increased revenue both justifies and fuels the cost of further change.

As with manufacturing/converting, this is all about time. If you have the time and the strategic patience then



GET GOING!

working incrementally through the sequence of disciplines will certainly build a

professional diecutting manufacturing team. However, if time is limited, then the best approach would be to select those disciplines which will have the greatest impact in the shortest amount of time.

This evaluation and prioritization of the 25 disciplines is your first major decision in this project. The 25 disciplines are listed below:

01. *Workplace Safety*
02. *Teamwork & Teambuilding*
03. *Customer-Supplier Organization*
04. *The Education Cycle*
05. *Training & Skill Development*
06. *Standardize & Benchmark*
07. *Research & Development*
08. *Document the Process*
09. *Information Management*
10. *Time Management*
11. *Measurement Systems*
12. *Just-In-Time Organization*
13. *SMED*
14. *Inventory Management*
15. *Simplification*
16. *Computer-Integrated-Manufacturing*
17. *Toolmaking Organization*
18. *Pre-Press Organization*
19. *Team Changeover*
20. *Diecutting Quality Control*
21. *System Maintenance*
22. *The Facilitator*
23. *Work Planning*
24. *Close-the-Loop*
25. *Plan of Action*
26. *Summary*

You will notice on the following pages the 25 Disciplines, plus the Summary, are organized in a progress chart. This will enable prioritization, brainstorming, planning, execution, control, and evaluation to be scheduled and monitored.

Fast Press Changeover: Summary

“Insanity: doing the same thing over and over again and expecting different results.” Albert Einstein



Putting the nuts and bolts of this project together are not particularly difficult. But what is difficult is getting everyone focused on the importance of this initiative, keeping everyone together through the inevitable ups and downs of progressive change, and persist in the face of obstacles and challenges.

When I look at our future, I believe we have run out of wiggle room. We have to make productive improvement, we have to change quickly, and we are running out of time. Perhaps this program does not meet your needs. You can either adapt this program or choose an alternative plan of action.

But now is the time to choose a course, to select a crew, to design and build your craft, to set voyage, and to push on until you reach the destination.

Remember how George Washington exhorted his team when faced with myriad challenges: ***“We must never despair; our situation has been compromising before, and it has changed for the better; so I trust it will again. If difficulties arise, we must put forth new exertion and proportion our efforts to the exigencies of the times.”***



DIECUTTING CONVERTING
Manufacturing System of Organization
Implementation Schedule

	PRIORITY	Brainstorm	Planning	Execute	Control	Evaluate
04: Workplace Safety						
05: Teamwork & Teambuilding						
06: Customer-Supplier Organization						
07: The Education Cycle						
08: Training & Skill Development						
09: Standardize & Benchmark						
10: Research & Development						
11: Document the Process						
12: Information Management						
13: Time Management						
14: Measurement Systems						
15: Just-In-Time Organization						
16: SMED						

DIECUTTING CONVERTING
Manufacturing System of Organization
Implementation Schedule

	<i>PRIORITY</i>	<i>Brainstorm</i>	<i>Planning</i>	<i>Execute</i>	<i>Control</i>	<i>Evaluate</i>
<i>17: Inventory Management</i>						
<i>18: Simplification</i>						
<i>19: Computer-Integrated-Manufacturing</i>						
<i>20: Toolmaking Organization</i>						
<i>21: Pre-Press Organization</i>						
<i>22: Team Changeover</i>						
<i>23: Diecutting Quality Control</i>						
<i>24: System Maintenance</i>						
<i>25: The Facilitator</i>						
<i>26: Work Planning</i>						
<i>27: Close-the-Loop</i>						
<i>28: Plan of Action</i>						
<i>29: Summary</i>						

Chapter 2:

What are the Key Dynamics of Diecutting Press Changeover: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ The keys to success in this program are Team Work & Effective Communication.
 - ✓ Much of what we need to be successful is already in place. It is simply a question of re-focusing and re-organizing existing resources.
 - ✓ One of the difficult challenges is to have the discipline and the patience to develop a consensus for each method, practice and procedure.
 - ✓ The greatest challenge in the current system of manufacturing is to reconcile and unify all of the different methods and practices to create a consensus approach to change.
 - ✓ To be successful it is vital to communicate frequently and often and to lay the groundwork for this project gently and carefully.
 - ✓ The future of any effective manufacturing operation is based upon continual benchmarking and steady daily improvement. Establishing the practice of the Current Best Operating Procedure establishes both a unifying method, and also an awareness each procedure will regularly change as we gain new knowledge and new insights.
- ✓ The most effective method of creating a Standard Operating Procedure is to first document and approve the procedure, and then videotape the procedure for easy training.
 - ✓ The sequence of videotaped procedures will form the basis of a fast, simple, but highly effective method of training and skill development.
 - ✓ It is important to implement the universal manufacturing mission statement of Safety, Speed, Quality & Cost, and integrate this discipline into every activity.
 - ✓ It is important to implement the universal manufacturing organizing principle of Closing-the-Loop, in the form of Plan-Execute-Control-Evaluate, as this proven technique will form the foundation of progressive improvement.
 - ✓ There are 25 key disciplines in this program, however, it is important each organization prioritizes their implementation based upon a realistic assessment of their current position.
 - ✓ The track record of our industry is not good when it comes to training and manufacturing excellence. It is vital to focus the entire organization on this key program of improvement, and to relentlessly persist in the face of inevitable obstacles.

Chapter 2:

What are the Key Dynamics of Diecutting Press Changeover: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ What is the greatest challenge in implementing this program for change?
 - ✓ What do you feel you must do to ensure the success of this initiative?
 - ✓ Why is building a consensus approach so difficult yet so important?
 - ✓ What is the greatest challenge in implementing this program for change?
 - ✓ What do you see as the obstacles to building an effective team in this organization?
 - ✓ What are three things you can and will do to develop teamwork and a consensus approach to improvement?
 - ✓ Why is it important to eliminate all of the different practices and to build the “Best-of-the-Best” methods and procedures?
 - ✓ What do you think of the concept of the Current Best Operating Procedure and what will you do to make this approach more effective?
- ✓ What does a System of Manufacturing mean to you and describe three changes you would make in the way you are working now?
 - ✓ What are the Two Primary areas or disciplines which form the basis of this process improvement program?
 - ✓ What is the universal four step mission statement, and how do you see it changing current methods and practices?
 - ✓ What is the four step planning discipline recommended and how do you see it changing the way you are currently working?
 - ✓ These disciplines are based upon the progressive principle of Closing-the-Loop. How do you see this approach impacting current procedures?
 - ✓ How should you recommend the team analyze, prioritize and implement the 25 disciplines specified in the manufacturing reorganization section of this program?
 - ✓ If you start this program, what is most important after the first step?

Manufacturing System of Organization

Section 01: Workplace Safety: The Most Important Priority

Key Definitions: ... *freedom from danger:* protection from, or not being exposed to, the risk of harm or injury ... *a lack of danger:* inability to cause or result in harm, injury, or damage ... *a safe place:* a place or situation where harm, damage, or loss is unlikely, and which does not involve any risk ... *the quality of averting or not causing injury, danger, or loss* ...

The Safety Mission Statement: "It is the mission and the preeminent responsibility of everyone entering the work area to be vigilant; and to anticipate, to prevent, and to protect every individual, including themselves, from risk, from accidents, from stress and from potential danger inherent to the workplace."

Workplace Safety: An Overview

"Better a thousand times careful than once dead."
~Proverb

It is no coincidence the first step in building a more effective system of manufacturing is to address the perennial challenge of workplace safety. Fundamentally, everyone involved in converting-diecutting accepts the importance of safety, however, making it an effective and up-to-date part of every action and every activity is another matter.

The universal mission statement of a manufacturing operation is **Safety-Speed-Quality-Cost**. See 01.1. This mission statement must be strictly enforced to ensure ev-



ery action is qualified and approved; and is executed and evaluated, with the safety of the individual and the team as the overriding benchmark for success.

The greatest change in the four principles of productive manufacturing, after the filter of safety has been applied, is the focus on **Speed** as the critical measurement for success. We were all trained with the goal that Quality was the highest priority for any company, however, even though the customer has more exacting requirements than ever, manufacturing is now a race against the clock. Speed-to-market, efficiency, fast turnaround and just-in-time organization are the benchmarks for success.

As **Speed** is the new benchmark we have to commit to finding faster, simpler, and more efficient ways to do things. Continuous improvement is essential, and the rate of daily change will out of necessity, accelerate. Working faster, responding more quickly; being flexible, and more adaptive; working in teams and responding to an increasingly diverse range of activity, will create a degree of inherent chaos.

It is interesting to note in the Chinese alphabet symbols many words have double mean-

混沌

ings. Chaos is represented by a symbol, which combines danger and opportunity! "Chaos often breeds life, when order breeds habit." Henry Brooks Adams

As chaos or dangerous opportunity is part of our immediate future, and speed is the driving force, integrating a different approach to safety becomes a necessity.

The mission statement demonstrates execution is a closed loop of activity. This is a learning cycle, with the goal of capturing solutions, new ideas, and better ways to do things. By continuously upgrading the system of manufacturing, cycle after cycle, we meet customer and market needs. But this loop also illustrates the repetitive nature of our process. And repetition breeds complacency, and complacency undermines our vigilance.

It is also important not to limit Safety to accidents and injuries, but it must also to focus on stress, fatigue, and long term repetitive motion, wear and tear. The goal is to make an ongoing focus on safe working congruent, compatible, and complimentary to process improvement. Making work an uplifting experience may be too esoteric for many, but it is essential to make the environment a safe and free from short term and long term accident and injury.

The ABC's of Fast Diecutting Press Changeover!

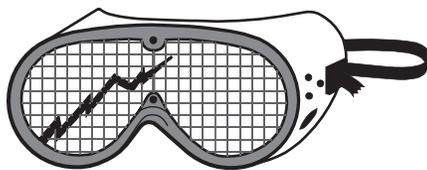
What are the challenges we face in this effort?

Workplace Safety: Problems & Solutions "While on a ladder, never step back to admire your work."

The structure of work consists of three activities:

- 1: Routines & Procedures
- 2: Innovation & Improvement
- 3: Trouble Shooting and Problem Solving

In practice, our time should be primarily expended in routines and procedures, or getting the job done. In practice, we expend excessive time in problem solving and trying to figure out the cause of each problem we face. Therefore, by addressing this reality head-on and by organizing process improvement using a logical **Problem-Cause-Solution-Innovation** structure, we are more likely to succeed and less likely to make the common mistake of attacking the symptoms of a problem rather than missing the root cause.



The advantage of the **PCSI** approach to process improvement is the clear definition of a problem, the precise delineation of the cause, almost inevitably reveals the solution, and the consistent preparation provides the perfect springboard for an innovative improvement to the procedure or the technique.

This analytical structure will be used through the manual to enable a clear definition of the challenge we face in our process improvement initiative.

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

The challenge of maintaining and improving a safe working environment, is it requires forcing a work team to focus intensely upon the potential for a lost time accident, a serious injury, and even fatal consequences. While everyone is genuinely determined to work safely, it is difficult to sustain productive enthusiasm for an unpleasant outcome. The goal of safety initiatives are to



try to get everyone to place the safety of themselves as a critical priority, while remaining vigilant in protecting the safety of their colleagues, as they work together as a team.

WRONG WAY

Asking each individual to determine how important their eyes, fingers, feet, ears, and health is to their future, may get their attention momentarily, but it has marginal impact on the status quo. Preparing for the unexpected, planning for an anomaly, trying to visualize the unforeseen, while essential and commendable is difficult for any work team.

No matter how threatened by the potential for a long term disability, and the impact on our families, we all feel invulnerable.

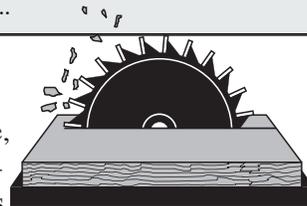
A focus on safety is often regarded as unproductive when there is so little time to discuss urgent issues, which are undermining the work teams livelihood. These initiatives are often regarded as a cynical contradiction when on one hand we are saying work safely, while on the other hand we are cutting manpower resources, combining responsibilities, and driving to increase the speed of processing.

While everyone accepts safety is a personal responsibility and it is a preventative discipline, it is necessary to attack the problem of safety in a different manner if we are to ensure optimal safety in the work place.

Finding the most effective solution requires having a better understanding of the causes of risk, danger, and accidents in the workplace.

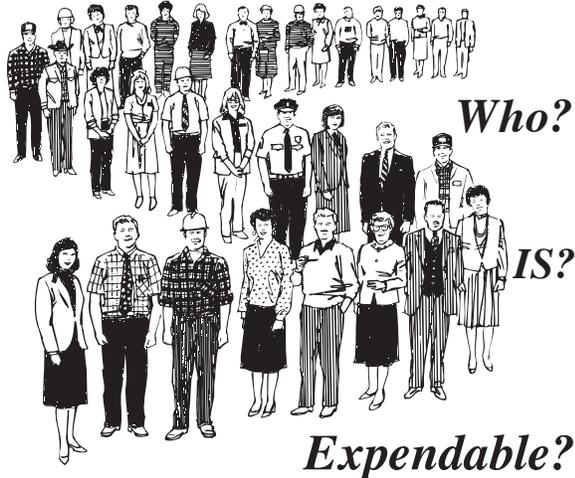
CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

As everyone in manufacturing has an investment in being safe, it is obvious a near miss, an accident, or a lost time incident is an unexpected and an unplanned, but often self inflicted failure. It is also true to state that an injury accident represents a deviation from normal practices and procedures.



And herein lies the key question? How many daily work activities are random, inconsistent and unpredictable? This is an important question because the majority of

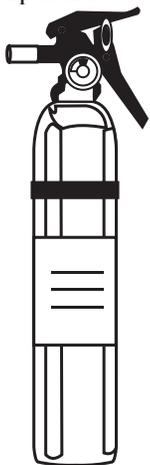
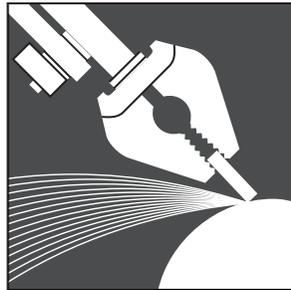
accidents and risk are the result of an action or an event, which took the person injured completely by surprise.



Therefore, the greater the predictability of the work environment, the greater the consistency of task execution, the greater the uniformity of routines and procedures, the greater the chance of eliminating variability in the form of an accident.

This statement makes two critical assumptions.

It is vital that absolutely everything involved in the system of diecutting manufacturing, from the layout of equipment and work; to the storage of tools and supplies; to the management of waste and diecut materials, to the cleaning and maintenance of every key piece of equipment; to the duties and responsibilities of every individual; and to the effectiveness of teamwork and communication protocol; is established through a team consensus, is documented and kept up-to-date, and is regularly and rigorously reviewed and updated.

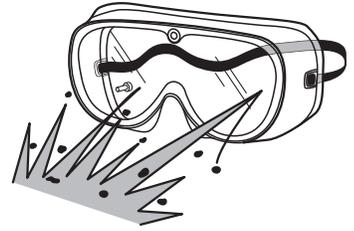


This also assumes every key participant is fully trained using an up-to-date training and cross training system? ***One of the key goals in any form of manufacturing is to get everyone to know what everyone already knows.*** This focus on procedural uniformity and performance parity is the key to any effective and efficient system of manufacturing.

Therefore, the cause of any form of breakdown in the system of safe manufacturing

is a deviation from Standard Operating Procedures, in the form of a non-routine activity.

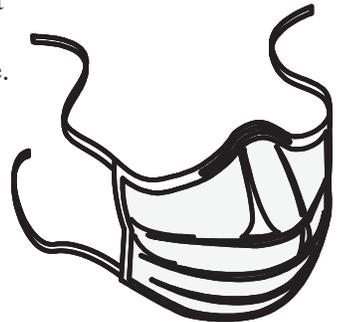
It is obvious that some of the following issues and actions cause breakdowns in procedures which lead to accidents and to incidents.



- ***Poor, & Incomplete Communication***
- ***Incorrect or Incomplete Instruction***
- ***Out of Sequence Activity***
- ***Poor Planning & Coordination***
- ***A Breakdown in Teamwork***
- ***A Lack of Knowledge, Skill or Experience***
- ***Stress, Frustration & Fatigue***
- ***Untidiness & Poor Housekeeping***
- ***Incomplete & Inconsistent Maintenance***
- ***Too Few or Too Many People***

And of course, the list goes on and on and on.

The position I am taking, is that it is often ineffective to expend time in exhorting a safe working environment, when the work environment and the system of manufacturing is inherently unstable.



It is my contention and my experience that by focusing on the development of a systematic approach to manufacturing, by improving the efficiency and the effectiveness of standardized benchmark procedures, by energetically pursuing training and education, and by building uniformity and consistency through teamwork, we not only improve safety we improve speed, we improve quality, and we reduce cost.

So how can we solve the challenge of creating a safe working environment, while we simultaneously pursue the goal of process improvement?

W. Edwards Deming seemed to have this in mind when he stated: "Learning is not compulsory but neither is survival."

The ABC's of Fast Diecutting Press Changeover!

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

Competence, knowledge, and safety in manufacturing are derived from the cumulative experience of all the people involved in the work team, *and all of the people who support the activity of the work team*. The primary disadvantage we face, is few diecutting organizations are disciplined enough or have the fortitude to combine all of the available talent into the fastest, the simplest, and the most effective methods and practices.

Every single production cycle must be used to benchmark the current best operating procedure; to share daily experience and to unify knowledge and techniques; to continuously improve and streamline the system of manufacturing; and to customize the work areas to permanently eliminate tools, materials, equipment and components, which are not necessary. The diecutting operation should be like inside of a fine time piece. The diecutting system should be ruthlessly pared down to the minimal required to be effective. If it is not essential to the effective operation of the current production task, it simply



should not be there.

This applies to work-in-progress, to tools and peripheral equipment, to materials and supplies, to waste and press components, and to people! Only those directly involved in the process must be allowed to enter this restricted area, at any time. Like a Hospital Emergency Room, only the minimum of space, materials, tools, and supplies, and only the essential team of people required to get the job done, are allowed in the vicinity of the work area.

The secret to an safe working environment is to eliminate random, arbitrary and inconsistently applied methods and practices, and to use every production cycle to pare the



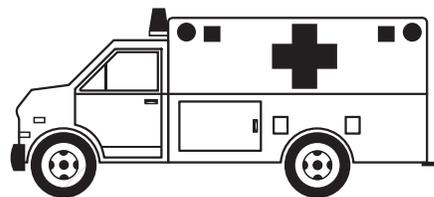
work areas down to the bare essentials. *"A place for everything and everything in place."* Every single part, material, component, tool, supply, piece of equipment, storage rack, waste material and work-in-process must be strictly confined to color coded, and mapped designated storage areas.



Clearly our reluctance to do this and our resistance to take a proven path to World Class Manufacturing excellence is at the core of our inability to achieve and sustain fast press changeover, to sell the first impression, and to maximize speed and yield.

Remember the universal manufacturing mission we defined earlier; *Safety-Speed-Quality-Cost?* Each discipline is connected and interconnected. It is impossible to work on one without impacting the other and vice versa. So to succeed we have to face the reality of building an effective and an efficient *system of manufacturing*. We must adopt a method of working and productive improvement, which addresses and unifies each and every one of these critical elements.

We currently have all of the knowledge, all of the skill and all of the experience in the existing work team, however, there are no disciplined methods designed to accumulate all of this ability into the best of the best.



As a trainer I often deliver the same message at the beginning of every session. *"You can do it anyway you want, as long as you all do it the same!"*

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

To put all of this together, and to integrate Safety seamlessly into a more effective system of manufacturing requires implementing the following plan of action.

- ➔ Form Two or Three Small Diecutting Improvement Teams.
- ➔ Define & Teach the Safety-Speed-Quality-Cost Mission.
- ➔ Divide & Prioritize the Process into Activities to

be analyzed.

- ➔ Break the selected activity into a prioritized series of tasks or actions.
- ➔ Choose a Standard Operating Procedure documentation and information collection format.
- ➔ Divide each procedure into prioritized steps or singular actions.
- ➔ Process each step using the following format:
 - * Sequence & Number each Step
 - * Describe the Step Action
 - * Add Comments & Guidelines
 - * Safety Approval & Sign Off
 - * Speed Approval & Sign Off
 - * Quality Approval & Sign Off
 - * Step Activity Time Record
 - * Step Elapsed Time Record
 - * Step Cost Calculation (Activity and cumulative cost.) *See below.*
- ➔ Develop each procedure and implement team approval.
- ➔ Members of the Team Videotape the procedure adding a voice-over.
- ➔ Implement the Training Map, Teaching & Certification System.

Some of these recommendations will be covered in more detail in lateral sections.

It is also necessary and an advantage to develop a checklist and questionnaire for the creation of each step in each procedure. For example the Safety Checklist could contain, but not be limited to, some of the following issues:

- ➔ *Where should the activity take place?*
- ➔ *What materials, tools, equipment and components are needed for task execution?*
- ➔ *How is the area properly prepared for this activity?*
- ➔ *What personal protection is required for execution of this task?*
- ➔ *What guards and safety devices are required for the execution of this task?*
- ➔ *What lockout procedures are necessary for this task?*
- ➔ *Are you and your colleagues qualified and prepared for execution of this activity?*
- ➔ *How do you determine everything is ready to proceed?*
- ➔ *How many people are required for this activity?*
- ➔ *How does the team communicate task progress and completion?*

Remember, this is simply a more effective and logical method of organizing what we are already doing. This information plays the role of a storyboard for the creation of the Video Taped Approved Procedure by the work team, adding a voice over commentary, for a simpler, faster and more effective method of training and retraining.

Standard Operating Procedure Title			PLATEN DIECUTTING: PRESS FOOTPRINTING								
SOP #:	04-05	Version #:	04.2	Department:	Pre-Press & Diecutting	Discipline:	Press Make- Ready	Page #	4.1		
Inception Date?	22-04-05	Update?	11-09-05	Approved by?	Ron Baker	Trainee?	TLK	Trainer?	RLB	Training Date?	June 05
Step	Action	Comments	Safety	Speed	Quality	Activity Time		Elapsed Time		Cost:	
1	Position the paper, squarely on the cutting plate, aligned with the leading edge of the plate, and tape securely.	Tape corners only, of the new Press Mapping Sheet, to create a flat taught sheet.	✓ Team Alpha	✓ Team One	✓ Team Driven	03	Minutes	03	Minutes	\$75	
2	Position a sheet of carbon paper, face down on the paper, completely covering the sheet.	Use 0.005" Bar-Plate Carbon Paper	✓ Team Alpha	✓ Team Driven	✓ Team One	03	Minutes	06	Minutes	\$75	
3	Using previously recorded pressure, gradually increase press tonnage, until the knives begin marking the patch-up sheet.	Keep a Pressure Record for every setting in the footprinting sequence	✓ Team One	✓ Team One	✓ Team Driven	05	Minutes	11	Minutes	\$125	
4	Mark the Outer Impression Perimeter or Outer Layer of the first pressure level.	Use a Black Felt Marker to mark the first Pressure Layer	✓ Team Alpha	✓ Team One	✓ Team Driven	07	Minutes	18	Minutes	\$175	
5	Increase pressure slightly, record the pressure setting and take a second impression	Make a note of the pressure setting, and add the setting to the Press Mapping Sheet.	✓ Team Alpha	✓ Team Alpha	✓ Team One	02	Minutes	20	Minutes	\$50	
6	Using a different colored Marker, outline the second pressure layer.	Use a Red Felt Marker to mark the second pressure layer.	✓ Team Driven	✓ Team One	✓ Team Alpha	03	Minutes	23	Minutes	\$75	

Workplace Safety: The Goals of Safety

“For they had learned that true safety was to be found in long previous training, and not in eloquent exhortations uttered when they were going into action.”

— Thucydides, ‘The History of the Peloponnesian War,’ circa 404 BC.

In establishing a direct connection between Safety and Productivity, between Safety and Disciplined Organization, and between Safety & Teamwork, we are redefining the traditional goals of diecutting manufacturing. In reality, we are delineating a more effective method of integrating work and personal safety. The key goals of this initiative are:

- ➔ *To fully integrate safe working practices into every element of the diecutting-converting process.*
- ➔ *To ensure every participant in the process has the knowledge, the skill and the support to work safely.*
- ➔ *To simplify, to reduce complexity, and to eliminate all unnecessary activity.*
- ➔ *To establish a direct connection between safe working practices, productive output, and professional craftsmanship.*
- ➔ *To raise every participants situational awareness and their ability to anticipate potential safety issues.*
- ➔ *To provide a system of training to develop procedural uniformity and performance parity.*
- ➔ *To minimize stress, fatigue, and physical wear.*
- ➔ *To integrate a system of manufacturing and maintenance to eliminate unplanned activity, deviation from approved procedures, and anomalies.*
- ➔ *To continuously improve a safe working environment, which maximizes productive output, and which eliminates harm, injury and dangerous practices.*
- ➔ *To get everyone involved, to keep everyone involved, and to integrate a daily focus upon safe working practices.*

The importance of an integrated focus on ***Safety-Speed-Quality & Cost***, is every activity and every experience, improves our knowledge, and our ability to make advances in each discipline. Every production cycle generates new knowledge, new opportunity, and realistically, new dangers. Therefore, by creating a ***“systematic”*** approach to diecutting converting we can continuously improve security, without compromising productivity.

Workplace Safety: Methods & Practices

“Of the major incentives to improve safety, by far the most compelling is that of economics. The moral incentive, which is most evident following an accident, is more intense but is relatively short lived.” — Jerome Lederer

Safety is both a key element of the manufacturing mission statement, ***Safety-Speed-Quality-Cost***, and it is the preeminent goal in converting, however, safety is always a by-product of an activity error or the incorrect execution of a task. Therefore, the only way we can realistically improve the safety of the work place is to improve the activities and the procedures, which expose the work team to risk of injury. And as there is always inherent risk in converting, diemaking and diecutting, every activity carries the potential for a lost time accident.

Therefore, to ensure a safe working environment, it is essential to commit to teamwork and to the creation of a systematic approach to standardized diecutting methods and practices, which will ensure predictability, uniformity and consistency.

Obviously, starting this project by conducting a safety audit; by conducting team brainstorming sessions; by verifying all safety tools, equipment, and guards are working properly; and by making sure everyone is proficient in the role and the use of every safety device, we are establishing the importance of safety from the start. However, even this activity should be organized as a standard operating procedure, it should be documented, and it should be videotaped for training of new personnel, and for an annual refresher for existing team members.

It is also important to implement the use of Guest Process Improvement Auditors immediately, and to seek every possible idea, suggestion, and recommendation for creating a safer, more efficient converting operation.

Simply stated, a safety incident is the result of a breakdown in or a deviation from, previously established, and benchmarked methods and practices, which represent the current best ideas of the entire work team.

This results in safety being adopted as the cornerstone of a productive operation, and it brings safety into it's critical role in manufacturing, as a vital assessment and measurement of an effective system of converting manufacturing.

Workplace Safety: The Benefits of Change
“Safety is understanding, it is an attitude of mind – it is not necessarily a simply following of rules or directions.” -Garry Richards.

This manual is focused upon developing a faster, a simpler, and a more effective system of working in diecutting converting. The definition of safety as the first step in the universal manufacturing mission statement of ***Safety-Speed-Quality-Cost*** is a critical recognition of the importance of this discipline. However, this project is not just about working safely, but about developing methods of working efficiently and effectively, with a safer working environment as a key benefit of this disciplined approach.

Simply stated, working on safety means working on process improvement, and working on process improvement, means working on safety. By putting together the most effective methods and practices, and by constantly upgrading and benchmarking these activities, we are constantly fitting pieces into a world-class manufacturing jigsaw puzzle, with safety as a key piece.

Working on process improvement will constantly expose issues and weaknesses in our current approach to safety, speed, quality, and cost. The benefit of the recommended approach to integrating safety into the process improvement process, is working on safety is the same as working on productivity.

Workplace Safety: Summary of Recommended Actions

“Out of this nettle, danger, we pluck this flower, safety.” – William Shakespeare, ‘King Henry the Fourth.’

Every step in the entire Fast Press Changeover process improvement initiative and this section on Safety, are closely interwoven, and the recommendations can be and will be duplicated in other section recommended actions. The following are some of the key actions you should consider in building a more effective and a safer system of diecutting manufacturing:

- ➔ *Discuss & brainstorm the process improvement project with the entire work team, and schedule a meeting to solicit feedback.*
- ➔ *Discuss and finalize a provisional implementation plan with the entire work team.*
- ➔ *Select & organize process development teams.*

- ➔ *Select Team Leaders and develop & define the mission for each team.*
- ➔ *Seek internal and external Team Facilitators or Team Mentors & Guides.*
- ➔ *Establish one or two teams to focus upon standard operating procedure development.*
- ➔ *Establish a Standard Operating Procedure Training & Certification Team.*
- ➔ *Implement Team & Team Work Training Programs.*
 - * Teamwork
 - * Meeting Protocol
 - * Brainstorming
 - * Time Management
 - * Problem Solving
 - * Resolving Disputes
- ➔ *Organize the Training & Skill Development Mapping System defined later in the manual.*
- ➔ *Implement a procedure and plan of action for key procedure training and certification.*
- ➔ *Divide the process into a series of Standard Operating Procedures and assign a development priority.*
- ➔ *Purchase & implement a digital video recording of each key procedure with a voice over by one of the training teams, and use the video as a training tool.*
- ➔ *The first procedure developed should be the identification, the training, and the certification in the use of all safety guards and equipment.*
- ➔ *Implement a program of standard operating procedure training and certification.*
- ➔ *Recruit an Internal & an External Team of Auditors, including but not limited to:*
 - * Inter-Department
 - * Inter-Company
 - * Suppliers
 - * Customers
 - * Consultants
 - * Guests
- ➔ *Implement a series of Planned & Unplanned Procedural Audits.*

At first glance this may seem a complex project, and it may seem that no matter how important safety is, it would be difficult to justify this level of effort. But in essence all of these recommended actions are basically components of the organization structure, which is essential to achieve and sustain fast press changeover. Starting with safety, simply defines this discipline as a critical and essential component of every procedure in diecutting manufacturing.

Section One:

Workplace Safety: The Most Important Priority : Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ Safety is the preeminent discipline of diecutting converting as is specified in the universal mission statement for all manufacturing. ***Safety-Speed-Quality-Cost.***
- ✓ The mission statement Safety-Speed-Quality-Cost is always shown as a closed loop of Education & Learning.
- ✓ It is important not to limit improving safety to simply accidents and injuries, but also to encompass stress, fatigue, and repetitive motion wear and tear.
- ✓ Work consists of three disciplines:
 - ***Routines & Procedures***
 - ***Innovation & Improvement***
 - ***Problem Solving & Trouble Shooting***
- ✓ The most effective method of managing the important problem solving discipline is by using the PCSI Structure. ***Problem-Cause-Solution-Innovation.***
- ✓ The critical problem undermining the safety of the work area is the unpredictability and the inconsistency of applied methods and procedures.
- ✓ The primary causes of accidents and injury are the following:
 - ➔ ***Poor, & Incomplete Communication***
 - ➔ ***Incorrect or Incomplete Instruction***
 - ➔ ***Out of Sequence Activity***
 - ➔ ***Poor Planning & Coordination***
 - ➔ ***A Breakdown in Teamwork.***
 - ➔ ***A Lack of Knowledge, Skill or Experience***
 - ➔ ***Stress, Frustration & Fatigue***
 - ➔ ***Untidiness & Poor Housekeeping***
 - ➔ ***Incomplete & Inconsistent Maintenance***
 - ➔ ***Too Few or Too Many People.***
- ✓ Every single production cycle must be used to benchmark the current best operating procedure; to share daily experience and to unify knowledge and

techniques; to continuously improve and streamline the system of manufacturing; and to customize the work areas to permanently eliminate tools, materials, equipment and components, which are not necessary.

- ✓ The secret to a safe working environment is to eliminate random, arbitrary and inconsistently applied methods and practices, and to use every production cycle to pare the work areas down to the bare essentials. Every single part, material, component, tool, supply, piece of equipment, storage rack, waste material and work-in-process must be strictly confined to color coded, and mapped designated storage areas.
- ✓ To put this together, & to integrate Safety seamlessly into an effective system of manufacturing requires implementing the following plan of action.
 - ➔ Form Small Diecutting Improvement Teams.
 - ➔ Teach the Safety-Speed-Quality-Cost Mission.
 - ➔ Divide & Prioritize the Process into Activities to be analyzed.
 - ➔ Divide the selected activity into a prioritized series of tasks or actions.
 - ➔ Choose a Standard Operating Procedure documentation & information collection format.
 - ➔ Divide each procedure into prioritized steps or singular actions.
 - ➔ Process each step using the following format:
 - * Sequence & Number each Step
 - * Describe the Step Action
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 - * Safety Approval & Sign Off
 - * Speed Approval & Sign Off
 - * Quality Approval & Sign Off
 - * Step Activity Time Record
 - * Step Elapsed Time Record
 - * Step Cost Calculation (Activity and cumulative cost.) ***See below.***
 - ➔ Develop each procedure and implement team approval.
 - ➔ Members of the Team Videotape the procedure adding a voice-over.
 - ➔ Implement the Training Map, Teaching & Certification System.

Section One:

Workplace Safety: The Most Important Priority : Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ What is the Safety Mission Statement?
 - ✓ Please define safety in your own words?
 - ✓ Why does Safety come first in the manufacturing mission statement ***Safety-Speed-Quality-Cost?***
 - ✓ Why does Speed come before Quality & Cost in the manufacturing mission statement ***Safety-Speed-Quality-Cost?***
 - ✓ Why is ***Safety-Speed-Quality-Cost***, shown as a closed loop of activity?
 - ✓ What are the three activities of work?
 - ✓ What does PCSI represent, and how does it work?
 - ✓ What do you think causes an unsafe working environment?
 - ✓ Why would greater consistency of task execution, and greater uniformity of routines and procedures, improve the chances of eliminating variability, in the form of an accident?
 - ✓ List five causes of accidents and injury in the work area?
 - ✓ How should all work activity be organized to minimize the chance of an accident?
 - ✓ Why would restructuring all of the work areas using the principles of Hospital Emergency Room organization impact safety?
 - ✓ How would you recommend integrating quality into the documentation of a standard operating procedure?
- ✓ Why would videotaping an approved standard operating procedure prove to be such an advantage in training and in implementation?
 - ✓ List and explain three key goals of the safety initiative?
 - ✓ How should all change current methods and practices to strengthen safety and personal security, to increase speed, to improve quality, and to reduce operating cost?
 - ✓ Describe how working on improving safety in the workplace will improve productive performance in diecutting-Converting?
 - ✓ How would you see process improvement teams working to improve safety and to increase productive output?
 - ✓ How would you react to an unplanned safety audit, and how would you use the observations that were made?
 - ✓ What do you see the value of reporting every accident, near-miss, and safety violation?
 - ✓ Have you every had any form of accident or injury in diecutting-converting?
 - ✓ Did you report the accident or incident, and what remedial action was taken?

Manufacturing System of Organization

Section 02: Building Effective Teams through Team-Work

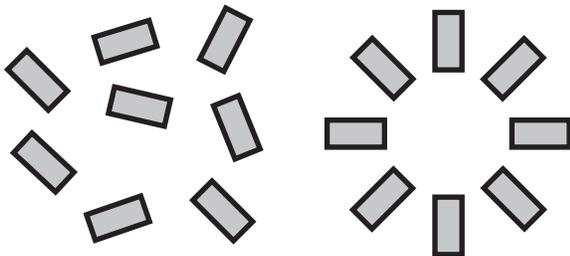
Key Definitions: ... people organized to function cooperatively as a group ... two or more people working together ... people associated together in work or an activity ... people working together, with everyone contributing to the success of a project ... a common endeavor ... a commitment to work together for a common goal ... people with a unity of purpose ...

The Team Mission: "It is the mission of the team to complete the assigned tasks on time, by creating a positive and productive learning environment; by seeking team excellence through shared knowledge, skill and experience; by recording problems, by brainstorming solutions, and by sharing innovation; by effective communication and honest respectful feedback; and by helping every team member to be an effective team player, to be a professional craftsman, and to be a successful individual."

Building Effective Teams through Team-Work: An Overview

"The whole object of the organization is to get cooperation, to get to each individual the benefit of all of the knowledge and all of the experience of all of the individuals." ~Hamilton Barksdale

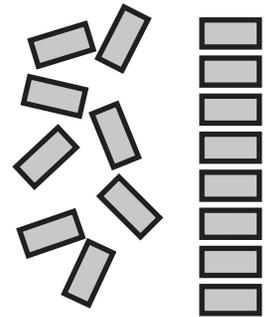
Selecting Safety as the first section of this program is clearly a reflection of the preeminent importance of this discipline over all others in the manufacturing operation. It is also just as significant that the second most important discipline to focus upon is Team Building & Teamwork.



As with safety, it is easy to underestimate a process, where the perception is, it is either a simple way of working together, which builds mutual success, or it is a complex activity, which undermines independence and freedom. In reality we are all members of teams, whether we recognize it or not. As Lyndon Baines Johnson stated: *"There are no problems we cannot solve together, and very few we can solve by ourselves."*

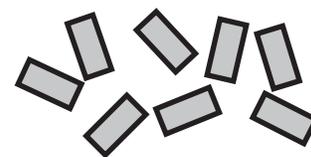
Every organization, every company, every department, and every discipline in the converting manufacturing operation are de facto teams, whether effective and focused, or dysfunctional and disorganized. We are pulled inexorably together, no matter how well or how poorly we interact. When a customer considers your organization they would be horrified if they discovered this important supplier was not the seamless interaction of cooperating

professionals, you pretend to be! An even more disturbing fact for isolationists, is your company and any type of business group consisting of people, is primarily a social organization, where personal relationships are the glue which builds our economic security.



In practice, team work and team organization are neither easy nor simple, and it is important to recognize and accept the challenge of building, sustaining, and leading teams to success. However, the current situation, in which every person forms their own strategy, executes their own plan of action, and uses inconsistently applied methods and practices, is clearly the cause of our inability to manage changeover. To build a world class, efficient fast press changeover organization, we have to work well and we have to work together. But we have to be realistic.

People are not the same. They hold different and strongly held ideas and attitudes; perceptions and prejudices; comfort levels and conflict zones; and likes and dislikes; all of which impact the way they behave, the way they react to change, and the way they communicate. However, even though in the short term, teamwork can be chaotic, we have little choice

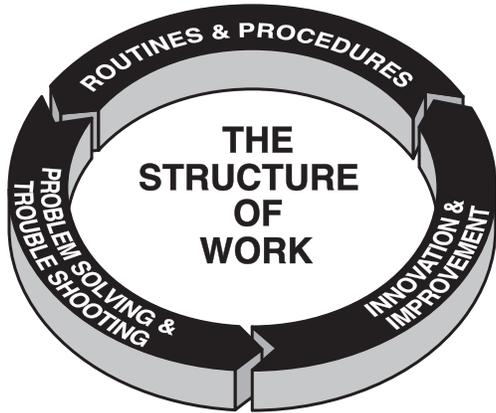


in this aggressive market but to work together for our survival.

The good news is, people want to succeed, but fear, habit, or peer pressure limit their potential. It is a rare individual

The ABC's of Fast Diecutting Press Changeover!

who leaves the operation at the end of the day feeling good about his effort, when the day was a productive disaster. To repeat, people want to succeed! However, it is vital to integrate experienced team facilitators and coaches at the beginning of the project to overcome the lack of teamwork experience and the inevitable start-up issues.



As I am sure you have previously experienced, achieving fast press changeover is a not a technically complex challenge, however, with the current inconsistently applied individual interpretation of what is most effective, it is impossible to sustain. It is useful to consider this Daniel Webster quote; *“Man is a special being, and if left to himself, in an isolated condition, would be one of the weakest creatures; but associated with his kind, he works wonders.”*

Building Effective Teams through Team-Work: Problems & Solutions

“We must all hang together, or most assuredly we shall all hang separately.” ~Benjamin Franklin

In the Safety Section of the manual we specified work as consisting of three activities:

- 1: Routines & Procedures***
- 2: Innovation & Improvement***
- 3: Trouble Shooting and Problem Solving***

To reinforce this reality it is important to remember that Manufacturing and Diecutting Converting is primarily a Research & Development activity. Every person expends excessive time trouble shooting production problems, and trying new techniques and testing potential solutions.

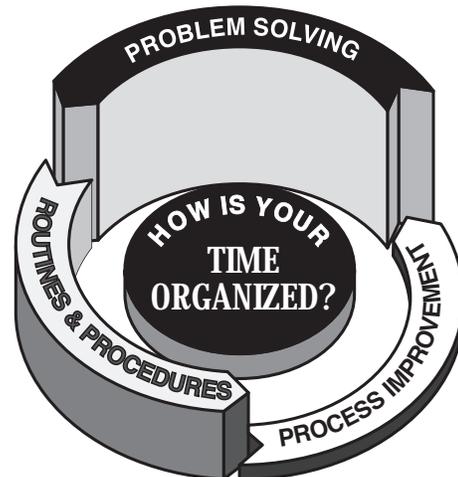
Our Achilles Heel is our failure to collect, to combine, and to integrate all of these experiences, in solving problems and finding solutions, to continuously upgrade our methods and practices. Why reinvent the wheel!

If you discover a faster, simpler and more effective way to do things, why not combine your discovery with everyone else? In the same way, why struggle and get stressed and frustrated, if the problem you are facing was solved by a colleague several weeks ago?

Working together is the solution, so let us examine the issues we face.

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

Although the goal of sustaining fast press changeover, of 30 minutes or less, is achieved daily by a small number of diecutting converting operations in different countries, the majority of organizations fail to make it out of the starting blocks.



It is painfully obvious that under relentless marketing and economic pressure, those companies who are forced to give up, set unrealistic and unreachable goals. Directed by higher management, the supervisory team enthusiastically jumps into the project, sets wildly impractical targets, invests minimal planning and preparatory time, ignores all of the existing problems and constraints, and with little time invested in detailed discussion and communication with the work force, the initiative is inevitably, DOA. Dead-on-Arrival!

It is important to recognize that creating an efficient manufacturing operation built around productive teams and effective team work, requires an intense short term effort, which in the majority of cases, leads to long term productive success.

But in the beginning, it is bloody complex, and bloody

and complex!

There are years of tradition, precedent, and inflexible habits; established methods, however diversified; an inability to understand the need for or to see the benefit of change; a deep suspicion of untried concepts and a fear of exposure; a multitude of ideas and suggestions for improvement; and a motivation to see real personal benefit before they will even begin to discuss the project.

“Failures are divided into two classes: those who thought and never did, and those who did and never thought.”
John Charles Salak

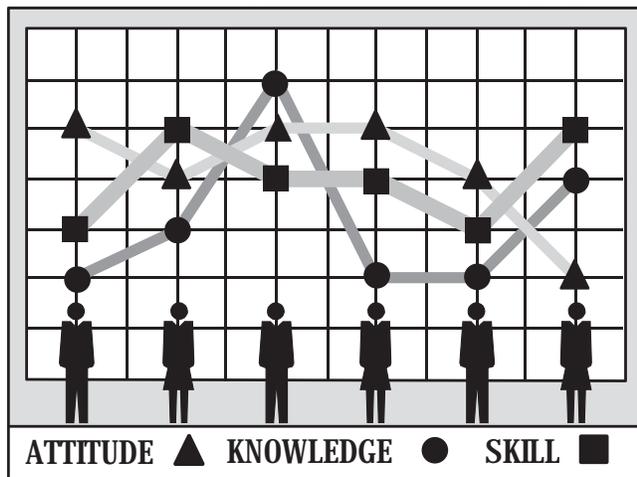
If you really want this to work, you have to invest the time, you have to invest the resources, and you have to invest the manpower to get this project underway.

It is important to remember we hire for Skill and we generally fire for Attitude! And this project is all about attitude! **So choose your attitude, up front!**

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

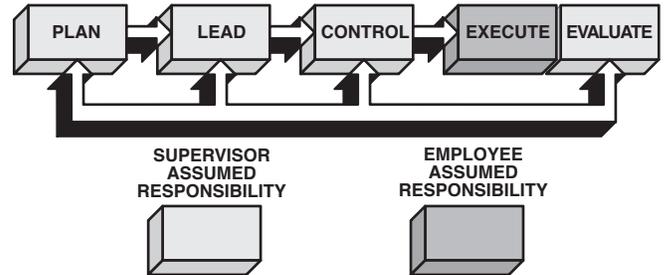
The primary cause of team driven converting failure is usually a combination of poor planning and preparation; of inadequate resources and of underestimating the time involved in getting the project underway. In understanding why previous experiments failed and/or what to avoid in the future, the common problems to consider would include:

- ➔ A failure to effectively explain why the project and the change in the system of working is essential for the future of every person and of the company.



The ABC's of Fast Diecutting Press Changeover!

- ➔ A failure to accurately estimate the time and the complexity of the team building foundation of the project
- ➔ A failure to allocate sufficient time for planning, for reviewing the project, and for consultation with the work team.
- ➔ A failure in seeking an experienced team building specialist to help with the formation and training of teams.



The Traditional Approach to Management.

- ➔ A failure to give the people involved in the process sufficient time to adjust to the plan of action
- ➔ A failure to address head-on the potential problem of difficult people
- ➔ A failure to get and sustain demonstrable support from the top of the organization and from all of the key players
- ➔ A failure to select simple and easy to accomplish projects to give the teams time to adapt to the new system of working

Every process improvement project in every company requires the participation, the cooperation, and the enthusiastic support of the majority of the work teams. It is important to communicate with, to involve, and to listen to the concerns and apprehension any group has to a change in the status quo.

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

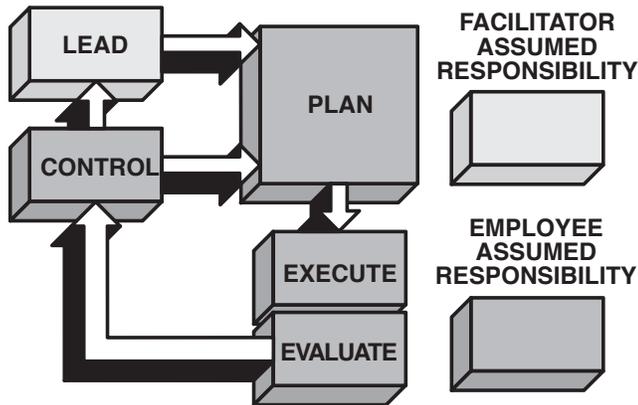
The solution is obviously to eliminate these failures and to ensure success by implementing some of the following actions. The success of team formation and team working would require:

- ➔ The manager of the department should convene a meeting with the entire workforce, and with the help of the Owner/President, and the entire

The ABC's of Fast Diecutting Press Changeover!

management team provide a project overview.

- ➔ The organization should contract with an experienced team trainer and facilitator.
- ➔ A provisional plan for the project and a vision statement should be developed with the manager, the team facilitator, one or two selected workers, and any union representative.



The Team Approach to Management.

- ➔ The manager, with the support of the owner/president, should present the plan to the entire workforce, and ask their assistance in finalizing the distributed provisional plan of action.
- ➔ A series of meetings should be scheduled between the workforce and the planning team to gather feedback, to answer questions, and to solicit suggestions to augment and improve the proposed program of change.
- ➔ All of the feedback, suggestions and concerns, are assimilated, revised and re-distribute the updated plan of action.
- ➔ A series of meetings is scheduled between the workforce and the planning team to gather feedback, to answer questions, and to solicit suggestions to augment and improve the proposed program of change.
- ➔ The initial teams are selected and training is schedule for the entire department.
- ➔ Simple and straightforward projects are selected to give the teams time to adapt to the new system of working.
- ➔ Team performance is evaluated, the plan adapted and the schedule adjusted accordingly.

This may seem pedantic, protracted, and pointless for some managers who are hell bent on turning the place around in a few months. It is vital to prepare meticulously

and to start slow, to ensure this project succeeds, and to make sure it does not become another in a long line of failed initiatives.

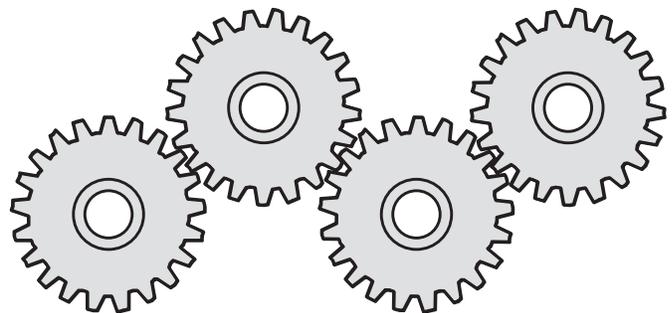
INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

The key to success in any endeavor is primarily related to how it makes us feel. One of the critical attributes of effective team driven organizations is **RAP**. No, this does not refer to music, but to **Respect, Appreciation, & Praise**. If this project is to be successful it is vital to celebrate every success, to show appreciation and to give respect for progress toward project goals. In organizations we praise people by giving them recognition for their achievement.

*"My great concern is not whether you have failed, but whether you are content with your failure."
Abraham Lincoln*

These are some of the innovative actions to build team success.

- ➔ Develop a team name, nickname and a by-line for each team, a team logo and colors,
- ➔ Select team colors and provide hats, T-shirts, jackets, and banners bearing the team name, logo, and by-line.
- ➔ Reward and publicly recognize achievement with inexpensive gifts, trophies & certificates
- ➔ Celebrate any and all successes with Pizza, Cake & Cookies.

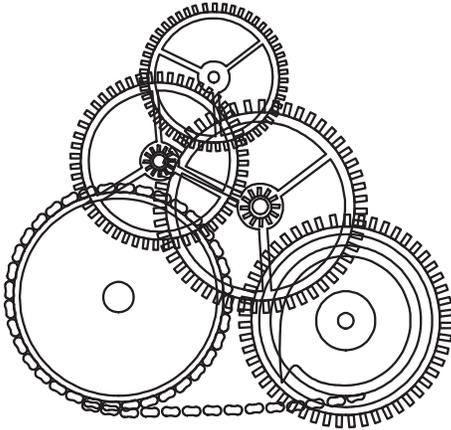


This initiative is important to the future of the company, but it is important to take pride in who we are and where we are, and to have some fun along the way. It will go a long way to breaking down barriers to progress.

Teamwork: The Goals of Teambuilding

“Most groups like stability. People work better with methods, procedures, and equipment they understand. They are more comfortable if they know what is going on. They dislike being in the dark. People who are comfortable and stable have healthier emotions and sharper minds.” – Donald G. Krause

The goals of this project are critical to the security and prospects of the company and every employee, and these goals should be used as regular benchmarks to assess the overall health of the project. These goals would include:



- ➔ Creating a faster, simpler and a more effective system of converting manufacturing.
- ➔ Reducing the cost of manufacturing and continuously lowering the resources required for each production cycle.
- ➔ Building and sustaining a system of working, which utilizes procedural uniformity and reinforces performance parity.
- ➔ Creating a more productive and personally rewarding work environment, which is easier to manage, which is stimulating to work in, and which builds the self esteem of every participant.
- ➔ Building extraordinary customer loyalty, and a reputation for speed to market, for quality of products and service, and for exceptional value, which is unmatched in the industry.
- ➔ Creating a world class, lean, fast response, low cost, innovative converting service, which consolidates the status and the value of the organization and its work teams.

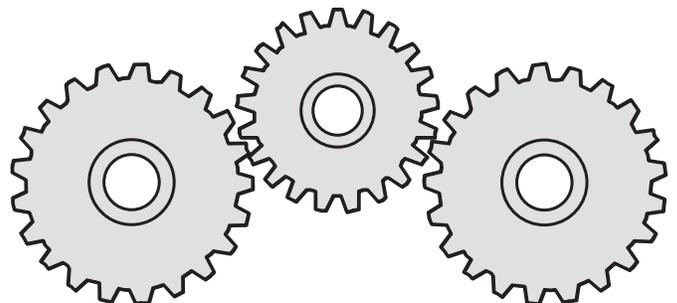
These goals are undoubtedly what most companies in theory are already striving to achieve. However, without a commitment to team work and to team building these goals are proving difficult to reach.

Teamwork: Methods & Practices

“Organizations exist to enable ordinary people to do extraordinary things.” ~ Ted Levitt

The key to effective teamwork and to the success of this project is to develop a consensus between all of the team members, to continuously combine their respective skills and knowledge, and to integrate their accumulated experience. Therefore, the system of working must ensure the foundation, the team and the relationship between team members, is strengthened and reinforced. The methods and practices, which would consolidate team viability would include:

- ➔ Providing education support to the teams in the form of an experienced team trainer, who could also play the role of an unbiased facilitator, mentor, or coach.
- ➔ Using the creation of documented and consensus driven videotaped standard operating procedures as the basis for building relationship and technical unity of purpose.
- ➔ Regularly scheduling time for each team to discuss problems, issues, and to develop a plan for potential changes.
- ➔ Implementing a regular team close out to ask:
 - * What is working well?
 - * What is less effective?
 - * What and how do we need to change?
- ➔ Providing training support to build and consolidate team and relationships skills, including:
 - * Leadership Training
 - * Resolving Disputes
 - * Meeting Management
 - * Planning & Organization



The ABC's of Fast Diecutting Press Changeover!

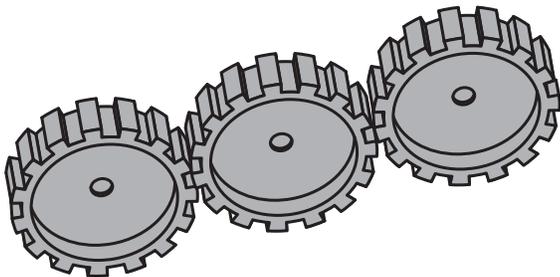
This is a project which will impact and change every previously employed method and practice of working, therefore, it is important to add techniques and procedures to all activity, which support and encourage team development and team work.

Teamwork: The Benefits of Change

“The race of mankind would perish did they cease to aid each other. We cannot exist without mutual help. All therefore that need aid have a right to ask it from their fellow-men; and no one who has the power of granting can refuse it without guilt.” ~ Scott Walter

Manufacturing has always been a continuous struggle as we are forced to adapt to crisis and to opportunity. Our reliance upon the responsibility, the prowess, and the commitment of a loose collection of individuals to poorly defined goals and shared objectives, is no longer an effective approach. The benefits of changing to a team drive system of manufacturing include:

- ➔ The ability of teams to make extraordinary progress when combining their talent and ability to reach a shared vision.
- ➔ The ability of teams to educate, to teach, and to rapidly develop technical competence.
- ➔ The ability of teams to simplify and to standardize a more effective and a more efficient system of converting-manufacturing.



- ➔ The ability of teams to self-manage and to take responsibility for every facet of daily working.
- ➔ The ability of teams to create a positive work environment, which promotes safety, speed, quality, and low cost manufacturing.

This is a significant change to the way we currently work, and while the initial stages of team building and team work appear challenging and complex, if the changeover is managed in a measured step-by-step fashion, the benefits of adopting this system of working are extraordinary.

Workplace Teambuilding:

Summary of Recommended Actions

“The man who gets the most satisfactory results is not always the man with the most brilliant single mind, but rather the man who can best coordinate the brains and talents of his associates.” ~W. Alton Jones

The first step in taking action in this project is to invest in a team trainer and a team specialist, who can facilitate and lead the team building project. It is more effective if the person is not from your organization, and while some industry knowledge is a benefit, this person should not play any technical role in the project, but merely advise and coordinate team building and team activity.

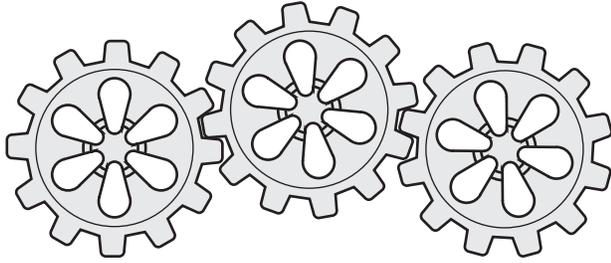
TEAM BUILDING ISSUES

- 01: The Team Charter**
(Why are we forming this team?)
- 02: The Team Values**
(How will we work together?)
- 03: The Team Mission**
(What are we trying to achieve?)
- 04: Team Measurement**
(How do we measure success?)
- 05: Team Management**
(How do we get things done?)
- 06: Team Procedures**
(How do we plan, execute, control & evaluate?)
- 07: Team Decision Making**
(How do select the most effective option(s)?)
- 08: Team Resources**
(How do we get the tools to do the job?)
- 09: Team Benefits**
(How will completion improve our status?)
- 10: Team Future**
(What happens when the project is complete?)

Many of the steps and team building project actions have been specified, however to reiterate the important sequence of activity, the recommended actions are:

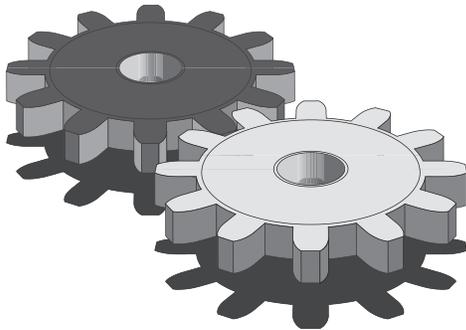
- ➔ The project and the initiative should be presented to the entire workforce by the manager of the department, with the full support of the entire company management team.

- The organization should contract with an experienced team trainer and facilitator.
- A Planning Team should be selected including the facilitator, the department manager, one or two workers from the department, and one



representative from the internal supply department, one representative from the internal customer department, and any union representative appropriate to the diecutting-converting operation.

- The Planning Team should develop a provisional plan for the project and a vision statement to be presented to the work force.
- The manager, with the support of the owner/president, should present the plan to the entire workforce and solicit their assistance in finalizing the distributed provisional plan of action.
- A series of meetings should be scheduled between the workforce and the planning team to gather feedback, to answer questions, and to solicit suggestions to augment and improve the proposed program of change.
- The Planning Team assimilates all of the feedback, suggestions and concerns, revises and re-distributes the updated plan of action.
- The initial teams are selected and training for the entire department is scheduled.
- A team name, nickname and a by-line is developed for each team, with a team logo.



- Team colors are selected and hats, t-shirts, jackets, and banners are provided bearing the team name, logo, and by-line.
- The Planning Team chooses simple and

straightforward projects to give the new teams time to adapt to the new system of working and to gain experience in the new way of working

- The creation of documented and consensus driven videotaped standard operating procedures for these selected projects is employed as the basis for building relationship and technical unity of purpose.
- Implement a regular team close out to discuss problems and issues, asking:
 - * What is working well?
 - * What is less effective?
 - * What and how do we need to change?
- Evaluate team performance and adapt the plan and schedule further training accordingly.
 - * Leadership Training
 - * Resolving Disputes
 - * Meeting Management
 - * Planning & Organization
- Take any and every opportunity to reward and publicly recognize achievement with inexpensive gifts, trophies & certificates.
- Celebrate any and all successes with Pizza, Cake & Cookies.

As you can see this from this recommended approach to creating an effective team driven system of converting manufacturing, the project should be implemented in a measured, steady, and unrelenting fashion. In principle, each step is simple and straightforward, however, the key challenge of this project is in integrating this project into and with the daily race against a relentless market driven production clock.

Therefore, it is important to plan with this in mind and to anticipate, to develop, and to communicate contingency actions to deal with inevitable delay and disruption.

“Alone we can do so little; together we can do so much.” ~ Hellen Keller

Section Two:

Building Effective Teams through Team-Work: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ Every organization, every company, every department, and every discipline in the converting manufacturing operation are de facto teams, whether effective and focused, or dysfunctional and disorganized.
 - ✓ In practice, team work and team organization are neither easy nor simple, and it is important to recognize and accept the challenge of building, sustaining, and leading teams to success.
 - ✓ People are not the same. They hold different and strongly held ideas and attitudes; perceptions and prejudices; comfort levels and conflict zones; and likes and dislikes; all of which impact the way they behave, the way they react to change, and the way they communicate.
 - ✓ It is important to recognize that creating an efficient manufacturing operation built around productive teams and effective team work, requires an intense short term effort, which in the majority of cases, leads to long term productive success.
 - ✓ If you really want this to work, you have to invest the time, you have to invest the resources, and you have to invest the manpower to get this project underway.
 - ✓ The primary cause of team driven converting failure, is usually a combination of poor planning and preparation; of inadequate resources and of underestimating the time involved in getting the project underway.
 - ✓ One of the critical attributes of effective team driven organizations is **RAP**. No, this does not refer to music, but to **Respect, Appreciation, & Praise**.
- ✓ This initiative is important to the future of the company, but it is important to take pride in who we are and where we are, and to have some fun along the way. It will go a long way to breaking down barriers to progress.
 - ✓ The key to effective teamwork and to the success of this project, is to develop a consensus between all of the team members to continuously combine their respective skills and knowledge, and to integrate their accumulated experience.
 - ✓ Our reliance upon the responsibility, the prowess, and the commitment of a loose collection of individuals to poorly defined goals and shared objectives, is no longer an effective approach.
 - ✓ This is a momentous change to the way we currently work, and while the initial stages of team building and team work appear challenging and complex, if the changeover is managed in a measured, step-by-step fashion, the benefits of adopting this system of working are extraordinary.
 - ✓ The first step in taking action in this project is to invest in a team trainer and a team specialist who can facilitate and lead the team building project.
 - ✓ As you can see this from this recommended approach to creating an effective team driven system of converting manufacturing, the project should be implemented in a measured, steady, and unrelenting fashion.
 - ✓ In principle, each step is simple and straightforward, however, the key challenge of this project is in integrating this project into and with the daily race against a relentless market driven production clock.
 - ✓ ***“Alone we can do so little; together we can do so much.” ~ Hellen Keller***

Section Two:

Building Effective Teams through Team-Work: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Why and how are Safety and Teamwork closely linked together?
- ✓ Why do you think team work is or is not the central theme of your organization?
- ✓ How is the structure of work divided into different activities?
- ✓ What do you feel are the major obstacles to implementing the team driven process described into your operation?
- ✓ What is R.A.P?
- ✓ Are you currently working a Production Team or a Process Improvement Team, and what are the strengths and the weaknesses of this approach?
- ✓ Do you see the important task of building self-esteem as a key component of your current team and working experience?
- ✓ Do you have a system in place to share knowledge and experience between your colleagues and yourself, and between other teams in the organization?
- ✓ Do you believe teamwork is an effective short and long term strategy for your organization?
- ✓ Have you or are you involved in team building training and team development?
- ✓ Why would it be important to have demonstrable ongoing support for the team project from the President, the Owner, and the Senior Management Team?
- ✓ Would you be willing to work in and lead a team?
- ✓ How would you recommend starting the team building and team work process in your organization?
- ✓ What are the strengths and weaknesses of your company?
- ✓ What are the strengths and weaknesses of your department?
- ✓ What are the strengths and weaknesses of your role in the organization?
- ✓ How would you approach setting up a team driven process in your organization?

Manufacturing System of Organization

Section 03: Creating an Effective Customer-Supplier Chain

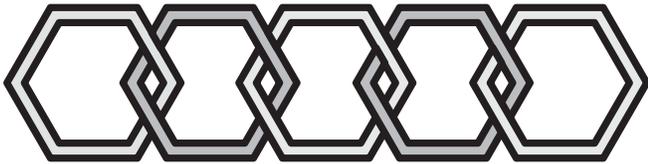
Key Definitions: ...*Customer/Supplier Service* is a key function, within a group, a department or a company, who is responsible for: working with customers to fulfill their orders and to ensure their satisfaction and success; to solve problems, resolve disputes and to coordinate remedial activity; to learn customer needs and requirements, and communicate them to the work team; and to work as the customer representative or agent in preparing and tracking customer orders, and making sure the customer requirements are comprehensively met.

The Customer-Supplier Mission: "It is our mission to form a close working relationship with each Supplier, particularly the Structural Design, Printing & Diemaking teams, and with each Customer, particularly the Finishing team, with the goal of; finding out what the customer needs, when they need it and how they need it, and explaining to each supplier, what we need, when we need it and how we need it; and establishing a regularly executed system of communication and cooperation to improve our understanding of each process."

The Customer Supplier: An Overview

"The hammers must be swung in cadence, when more than one is hammering the iron." ~Giordano Bruno

It is a common marketing mission to state; *"The customer is Number 1!"* While this is a great principle, the reality is, without your suppliers and your colleagues, there is little you can do for any customer. Therefore a more pragmatic mission is to state, your colleagues and your work team is number 1, your suppliers are number 2, and your *potential* customers, are number 3.



A diecutting-converting operation is simply a sequential chain of interconnected businesses. In terms of the internal structure of your organization, there are three key questions to ask:

- ➊ How effectively do you work with your internal suppliers?
- ➋ How effective is the work team in understanding the strengths and weaknesses of their internal suppliers, and the specific needs and requirements of their immediate customer?
- ➌ How effectively do you work with your internal customers?

The interaction between you and your suppliers and customers can be compared to a chain of people, with linked arms, trying to pull a drowning man from the water. If one person lets go, no matter how effectively the remaining people hang on to each other, the effort of everyone is wasted, and the man presumably drowns!

Diecutting-converting is just the same. Everyone is con-

nected, everyone needs to hang on, everyone is dependent on everyone else in the chain, and nobody wants to be the drowning man. Somehow, with so many overlapping jobs, multiple activities, and hourly crisis, we forget the essential principles of the *system of manufacturing*.

Do we really implement supplier certification and work approval, and do we work closely with your immediate supplier's customer service representative? (*Does this function exist in the Printing Department, and if not, why not? How do we know what the Printing Department can do, and how do they know what we need?*)

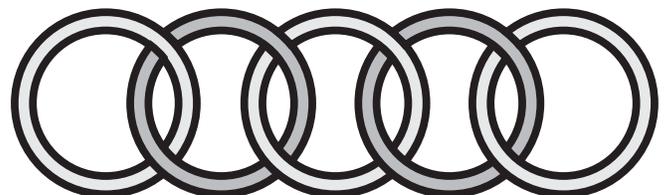
➔ Do we really implement a genuine and structured customer service effort in diecutting-converting, and work closely with the supplier representative from the Finishing Department?

➔ (*Does this function exist in the Diecutting-Converting Department, and if not, why not? How does the Finishing Team know what we can do and how do we know what they need?*)

➔ Do we work together on problems and issues, and seek the most effective work-in-process changeover, from one to the other?

➔ Do we train and cross-train key members of both teams so we both understand the constraints and the technical challenges of both processes?

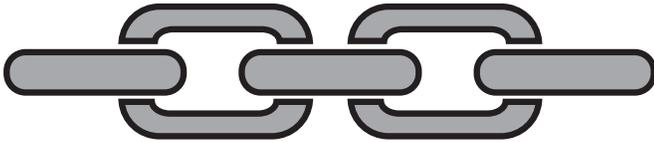
➔ Do we participate in regular problem solving, brainstorming and process improvement meetings?



- ➔ Do we understand both quality and processing requirements, and immediately communicate and work together to resolve problems and potential issues?
- ➔ Do we let them know, what is working well, what is working badly, and how they can help us to get better?

The lack of constructive and cooperative process improvement effort between departments and functions in the average diecutting-converting operation is a disaster!

Tommy Lasorda; *“There are three types of baseball players - those who make it happen, those who watch it happen, and those who wonder what happened.”*



The Customer-Supplier Chain: Problems & Solutions

“If a house be divided against itself, that house cannot stand.” ~New Testament, Mark 3:25

To be effective in a relationship between a number of people, groups, or organizations who share a common objective, there has to be good communication. No matter what it is, good or bad dialogue, we need to talk to each other, until we understand each other. In practice everyone is at once a customer and a supplier.

In the majority of organizations the customer-service representative is simply an order taker and facilitator, and has little technical interaction with a customer or a supplier. In the majority of companies, the process is broken down into logical groupings of distinctive and separate pre-production or production activity.

Each group or department is a small business unit, which has a number of suppliers, and usually provides critical services to one internal customer. This customer-supplier chain of activity should be seamlessly connected at several levels, to ensure a smooth flow from one department to the next.

Unfortunately, in the majority of converting operations the opposite is true. The communication between each

department in terms of scheduling, planning, coordination, problem solving, training, process improvement and quality management is inadequate, if it exists at all. This poses obvious questions for each department or function:

- ➔ Who is the Supplier Coordinator?
- ➔ Who is the Customer Service Representative?
- ➔ How can we possibly achieve World Class Manufacturing status with a fractured and ineffective system of interdepartmental communication?

We have to change to be successful!

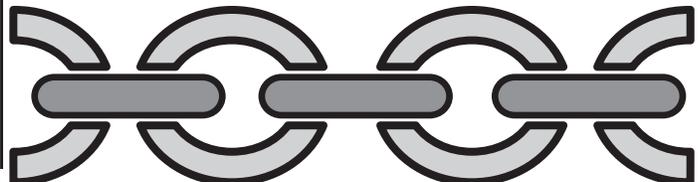
This section is about managing and organizing a change in the relationship between each internal department or business unit. The first question is obviously, why is there a problem?

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

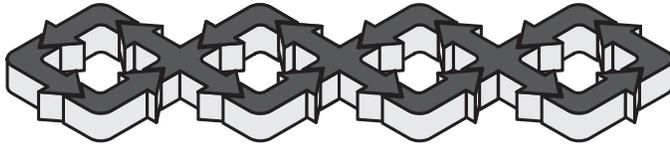
When it comes to the critical relationship between each separate business unit in a converting operation, we are remarkably complacent. It is not simply a question of an inadequate integration between suppliers and customers, there is no effective or systematic approach to cooperative improvement, to education and cross training, or to problem solving.

We make assumptions, we take chances, and we are ill prepared for production delays, for delivery quality variance, or for a breakdown in service. The more we know about a suppliers capabilities, the tolerances and limitations of their process, and their strengths and weaknesses, the more effectively we can adjust our process or pre-determine work acceptance/go or no-go guidelines.

The more they know about our process, the more accurately they can prepare work-in-process, the more precisely they can adjust their process to meet our needs, and the more timely they can provide Just-in-Time support.



Immediately, we consider our customer, these roles are reversed. We are now the supplier and they are the customer. Do we really know everything we need to know about our customer process? Do we translate this knowledge into more effective methods and procedures? Do we precisely and consistently meet their needs?



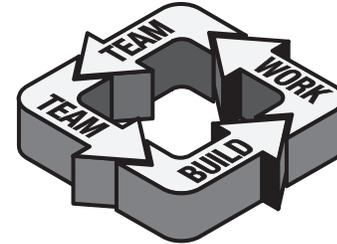
The unvarnished reality of this dysfunctional relationship, is it also extends to our external suppliers and to our external customers.

We are complacent, we are introspective, and we are ill-prepared for our failure to meet their needs.

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

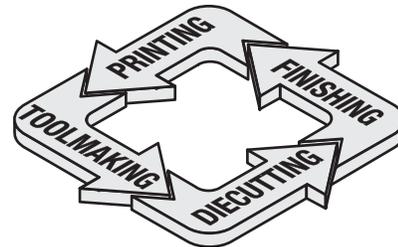
The primary cause of the problem is a failure to recognize the internal structure of a converting operation as a series of independent, but interdependent business units, which are designed to seamlessly interact on several cooperative levels. What is missing from these ineffective relationships?

- ➔ A failure to build a professional customer-supplier relationship between our internal suppliers, and with our internal customers.
- ➔ A failure to specify and document precise and unambiguous criteria for accepting information, for accepting work-in-process, and for accepting materials and supplies to be used in our process.
- ➔ A failure to work with our suppliers to develop a protocol for the transfer of work from one department to the next, and how and who would approve the transfer.
- ➔ A failure to set-up regular training and cross training programs between department personnel and supplier personnel, to develop a more pragmatic understanding of the limits and current constraints on each process.
- ➔ A failure for establishing a customer-supplier team from both departments to regularly discuss and find solutions to problems, issues, and non-conformance.



- ➔ A failure to appoint one person and a back-up in the department to act as supplier liaison, and to coordinate activity between each department.
- ➔ A failure to build a professional customer-supplier relationship between our internal suppliers, and with our internal customers.

- ➔ A failure to specify and document precise and unambiguous criteria for delivering information, for delivering work-in-process, and/or for delivering materials and supplies to be used in our customer's process.
- ➔ A failure to work with our customer to develop a protocol for the transfer of work from one department to the next, and how and who would approve the transfer.
- ➔ A failure to set-up regular training and cross training programs between department personnel and customer personnel, to develop a more pragmatic understanding of the limits and current constraints on each process.
- ➔ A failure for establishing a customer-supplier team from both departments to regularly discuss and find solutions to problems, issues, and non-conformance.



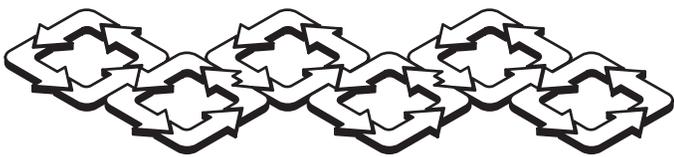
- ➔ A failure to appoint one person and a back-up in the department to act as customer-service representative and to coordinate activity between each department.

This organization structure may seem overly complex, but particularly because these are internal processes, because the people involved are working side-by-side, and because everyone has a basic understanding of each process, implementation is relatively easy, and daily execution is simple.

The ABC's of Fast Diecutting Press Changeover!

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

The solution is to change and upgrade your relationship with internal suppliers and internal customers to the same professional standards you have with external suppliers and with external customers. It is important to be realistic in this meeting. The current lack of professional standards between your department and your internal suppliers and customers did not happen overnight, therefore, it is sensible that both parties commit to a realistic but specific schedule of integration.



What are some of the things we need to put in place? We need to:

- ➔ Set-up a meeting between each supplier and/or customer department and discuss changing or upgrading the current relationship.
- ➔ Set up supplier and customer integration teams, with key personnel from both departments.
- ➔ List and prioritize the issues and integration we are working upon, including:
- ➔ Document and communicate the new relationship and the terms and conditions to the entire work force, and seek constructive feedback.
- ➔ Finalize each customer-supplier and supplier-customer relationship, get the agreement endorsed by top management, and circulate the agreement to the entire workforce.

There is nothing complex or difficult in this logical customer-supplier Chain agreement, however, it is important to make changes at a speed both teams and both departments can assimilate.

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

It is important to remember this is a cooperative venture and everyone involved is paid through mutual success,

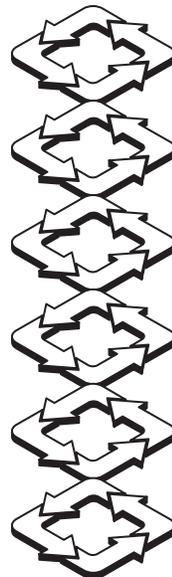
therefore, it is essential to be polite and respectful, but absolutely relentless! How could we ultimately improve this system of working together?

- ➔ Develop and post non-conformance reports.
- ➔ Develop a Key Result Analysis Chart, which is posted to show supplier and department performance on critical indicators.
- ➔ Organize a regular audit and customer-supplier chain report by a member of management, not involved in either department.
- ➔ Organize a work exchange program, where a member of each department experiences a day in the life of the customer or supplier department.

With all of these initiatives, designed to improve customer-supplier performance, it is important to remember you do not have the luxury of choosing alternative vendors, nor of seeking additional customers to replace the ones lost through poor performance. This is important work, but it is work amongst colleagues who share a common source of income, therefore, it is important to be respectful as both teams resolve problems and seek to improve mutual performance.

The Customer-Supplier Chain: The Goals of Integration

“Quality in a product or service is not what the supplier puts in. It is what the customer gets out and is willing to pay for. A product is not quality because it is hard to make and costs a lot of money, as manufacturers typically believe. This is incompetence. Customers pay only for what is of use to them and gives them value. Nothing else constitutes quality.” – Peter Drucker

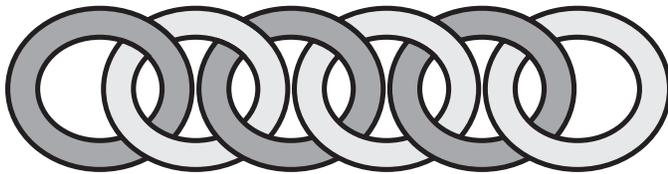


The timely delivery of work-in-process, the quality and consistency of the service provided, and the commitment to process improvement is a singularly unusual feature of converting operations. Everyone is racing against the clock, everyone is fighting fires, and therefore, everyone passes work through with the knowledge, there is little to do but to accept it, and do the best you can.

We take great care to select, to certify, and to police the performance of key external suppliers, and we are rightfully aggressive about non-conformance.

Therefore, it is illogical and commercially dangerous to allow lower standards of performance to form the basis for each internal customer-supplier relationship.

We expend enormous energy and resources to secure lucrative customers, and we go to extraordinary lengths to secure and protect customer loyalty. Therefore, it is illogical and tactically dangerous to allow lower standards of performance to form the basis for each internal customer-supplier relationship.



The goal of establishing an effective customer-supplier chain is to recognize the logic, the reality and the importance of a practical commercial relationship as the basis for the internal organization structure. It is vital to implement those commercial disciplines which drive company market success, to ensure the internal customer-supplier chain is built upon a foundation of disciplined and seamless integration.

The Customer-Supplier Chain: Methods & Practices

“Our educational system imparts mostly academic values, which emphasize optimum solutions, while putting little emphasis on such considerations as speed, cost, and customer satisfaction---the values of the marketplace.” ~Roland Schmitt

In defining the mission of a world class converting operation we identified ***Safety-Speed-Quality-Cost*** as key attributes. Realistically, the only way we can continually improve speed to market, reduce turnaround/response time, and increase throughput, is to improve performance in each process and develop a virtually uninterrupted flow from one department to the next.

In practice it makes little sense to work on the productivity, the quality, and the cost of manufacturing of one department, when you are willing to accept tools, materials, and work-in-process which fails to meet the needs of the process it is delivered to.

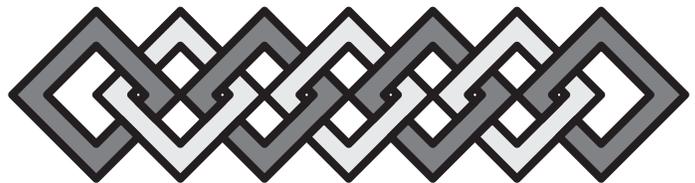
In principle, we regard internal suppliers as suppliers, and we recognize internal customers as customers, but in practice we do not! Continuous improvement is essential

for our survival, therefore, it is essential to implement the following methods and practices into the system of converting-manufacturing:

- ➔ Select a team leader to investigate and audit the current Customer-Supplier Chain.
- ➔ Interview key people from each department and develop a ***“State of the Union”*** assessment.
- ➔ Form Customer-Supplier Integration Teams between key processes.
- ➔ Form a Company Integration Team with representatives from each of the other teams.
- ➔ Develop a Customer-Supplier Chain Charter as a guideline for the Integration Teams.
- ➔ Using the ***“State-of-the-Union”*** report and the Charter, ask each Integration Team to set-up a series of meetings to develop a prioritized list of problems to be resolved.
- ➔ The Company Integration Team reviews the reports and with each individual team develops a realistic schedule for attacking each key issue.

The resulting methods and practices, or the way in which customer-supplier issues are resolved, should be documented and approved by the management team.

As each procedure is approved, training is scheduled to inform and coach every key employee through the new procedure.



As with each of the recommendations made in this project, you can pick and choose some or all, or mix and match ingredients to meet your specific company needs. Unfortunately, the need for a smooth interaction and the value-added flow of work from one process to the next, is an inescapable obstacle to sustained process improvement.

The Customer-Supplier Chain: The Benefits of Change

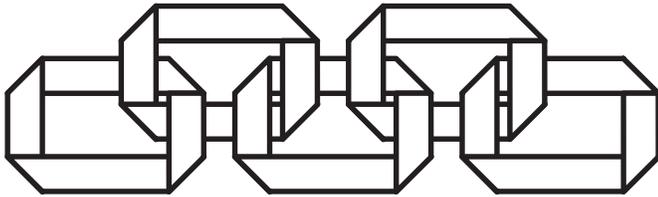
“Coming together is the beginning. Keeping together is progress. Working together is success” ~Henry Ford

To survive and to prosper in a global economy, it is obviously essential to order and receive the paperboard, to

The ABC's of Fast Diecutting Press Changeover!

sheet, print, diecut, glue, finish, pack and ship as quickly as possible. The stark reality of daily converting is we will be simultaneously processing 20 or 30 jobs in various stages of completion, we will experience multiple delays caused by multiple failures, and yet we must meet increasingly tight production and delivery deadlines.

The benefit of this change or upgrade to the current system of manufacturing, is the more each member of each department team knows about his or her supplier process and his or her customer process, the more confidently and the more rapidly they can respond to a potential bottleneck or problem.



Knowledge is power, and it is my experience that the majority of process integration problems stem from ignorance and inexperience, rather than from indolence and indifference.

In the previous section we discussed team building and teamwork, and selecting the Customer-Supplier Chain as the next priority, both identifies this initiative as a high priority and as an extension of the same team principles and practice we deemed critically important to success.

The Customer-Supplier Chain: Summary of Recommended Actions

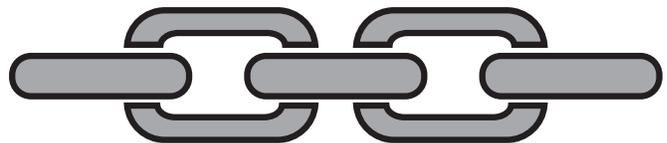
“A community is like a ship; every one ought to be prepared to take the helm.” ~Henrik Ibsen

This is an important element of generating a fast flow, highly efficient system of converting manufacturing, and the recommended actions should include the following:

- ➔ Select a team leader to investigate and audit the current Customer-Supplier Chain.
- ➔ Form a Company Integration Team with representatives from each of the other teams.
- ➔ Form Customer-Supplier Integration Teams between key processes.
- ➔ Develop a Customer-Supplier Chain Charter as a guideline for the Integration Teams.
- ➔ Using the ***“State-of-the-Union”*** report and the Charter, ask each Integration Team to set-up a series of meetings between their respective

departments to discuss upgrading the current relationship and to develop a prioritized list of problems to be resolved.

- ➔ List and prioritize the issues and integration to be worked upon, including:
 - * How to document work-in-process transfer and acceptance criteria.
 - * How to schedule production work to maximize efficiency.
 - * How to communicate and share work-in-process information.
 - * How to organize and coordinate the training, work exchange and education of key personnel in both departments.
 - * How to deal with and resolve problems and issues.
 - * How to, and when to schedule regular process improvement meetings.
 - * How to develop a Key-Result-Analysis charting system, which shows graphically supplier and department performance on critical indicators.
 - * How to develop and post non-conformance reports.
- ➔ The Company Integration Team reviews the reports and with each individual team develops a realistic schedule for attacking each key issue.
- ➔ Finalize each customer-supplier and supplier-customer relationship, get the agreement endorsed by top management, and circulate the agreement to the entire workforce.
- ➔ Organize a regular audit and customer-supplier chain assessment report by a member of management, who is not involved in either department.
- ➔ Organize a work exchange program, where a member of each department experiences a day in the life of the customer or supplier department.



The resulting methods and practices, or the way in which customer-supplier issues are resolved, should be documented and approved by the management team. As each procedure is approved, training is scheduled to inform and coach every key employee through the new procedure.

Section Three:

Creating an Effective Customer-Supplier Chain : Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ It is a common marketing mission to state; **“The customer is Number 1!”** While this is a great principle, the reality is, without your suppliers and your colleagues, there is little you can do for any customer. Therefore, a more pragmatic mission is to state, your colleagues and your work team is number 1, your suppliers are number 2, and your **potential** customers, are number 3.
- ✓ A diecutting-converting operation is simply a sequential chain of interconnected businesses. In terms of the internal structure of your organization, there are three key questions to ask:
 - ❶ How effectively do you work with your internal suppliers?
 - ❷ How effective is the work team in understanding the strengths and weaknesses of their internal suppliers, and the specific needs and requirements of their immediate customer?
 - ❸ How effectively do you work with your internal customers?
- ✓ To be effective in a relationship between a number of people, groups, or organizations who share a common objective, there has to be good communication. No matter what it is, good or bad dialogue, we need to talk to each other, until we understand each other. In practice everyone is at once a customer and a supplier.
- ✓ Each group or department is a small business unit, which has a number of suppliers, and usually provides critical services to one internal customer. This customer-supplier chain of activity should be seamlessly connected at several levels, to ensure a smooth flow from one department to the next.
- ✓ When it comes to the critical relationship between each separate business unit in a converting opera-

tion, we are remarkably complacent. It is not simply a question of an inadequate integration between suppliers and customers, there is no effective or systematic approach to cooperative improvement, to education and cross training, or to problem solving.

- ✓ It is important to remember this is a cooperative venture and everyone involved is paid through mutual success, therefore, it is essential to be polite and respectful, but absolutely relentless! How could we ultimately improve this system of working together?
 - ➔ Develop and post non-conformance reports.
 - ➔ Develop a Key Result Analysis Chart, which is posted to show supplier and department performance on critical indicators.
 - ➔ Organize a regular audit and customer-supplier chain report by a member of management, not involved in either department.
 - ➔ Organize a work exchange program, where a member of each department experiences a day in the life of the customer or supplier department.
- ✓ We expend enormous energy and resources to secure lucrative customers, and we go to extraordinary lengths to secure and protect customer loyalty. Therefore, it is illogical and tactically dangerous to allow lower standards of performance to form the basis for each internal customer-supplier relationship.
- ✓ In defining the mission of a world class converting operation we identified **Safety-Speed-Quality-Cost** as key attributes. Realistically the only way we can continually improve speed to market, reduce turnaround/response time, and increase throughput, is to improve performance in each process and develop a virtually uninterrupted flow from one department to the next.

Section Three:

Creating an Effective Customer-Supplier Chain : Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ How would you prioritize the importance of your colleagues, your internal customers, and your internal suppliers?
- ✓ How effectively do you currently work with your internal suppliers?
- ✓ How effectively do you currently work with your internal customers?
- ✓ How would you describe the benefits of working more closely, and more cooperatively, with your internal customers and internal suppliers?
- ✓ How beneficial would it be to spend time training and cross training in the Printing and the Gluing Departments?
- ✓ How is the receipt of materials, tools, supplies and work-in-process accepted into and approved for your use?
- ✓ How do the different departments in your organization, suppliers and customers, work together to improve the process, they share?
- ✓ What currently happens to analyze and to

evaluate a work-in-process problem or a non-conformance issue?

- ✓ What cooperative actions are consistently taken to prevent a repeat of each problem?
- ✓ How is the relationship, the cooperative involvement, and the technical integration between your department and your supplier(s) handled?
- ✓ How is the relationship, the cooperative involvement, and the technical integration between your department and your customers(s) handled?
- ✓ If a problem or a work-in-process failure occurs, how do you, your supplier, and/or your customer work together to solve the immediate problem, and to eliminate a recurrence of the problem?
- ✓ What actions would you recommend to improve the working relationship between your department and your internal supplier(s)?
- ✓ What actions would you recommend to improve the working relationship between your department and your internal customer(s)?
- ✓ How is the performance and the integration of one department into another evaluated, measured, communicated, and used as the basis for remedial change?

Manufacturing System of Organization

Section 04: The Power of Teaching & Education

Key Definition: Education: imparting & acquiring of knowledge through teaching & learning ... the process of education or being educated ... knowledge gained through systematic study ... instructive or an enlightening experience ... developing the powers of reasoning & judgement ... as determined by the knowledge skill, or discipline of character, acquired ... it is a preparation for

The Education Mission Statement: "It is our mission to work together as a team to define the knowledge, the skill, and the experience we share; to define the knowledge, the skill, and the experience we need; and to acquire the learning resources & education tools, which will enable us to develop a system of education we can share for our mutual success."

The Power of Teaching & Education: An Overview

"The educated differ from the uneducated as much as the living from the dead." ~Aristotle

A majority of companies regard a sound technical training program as an important strategic goal, even though a perceived lack of time, lack of resources and of lack organizational ability, continually undermines any attempt to get an effective program off the ground. Their continued survival, however uncertain, seems to reinforce a notion, that while training is important, it is not essential, it is not a short term solution, nor is it the key to increased productivity and profitability.



Training is simply, teaching and education of a specific type. As Mary Ann Allison stated: ***"Training is the teaching of specific skills. It should result in the employee having the ability to***

do something he or she could not do before."

The reason we continue to struggle, is we are trying to set-up a narrow technical training program, which has limited benefits to the trainer and to the participant. What we are missing is the power of teaching and of education, which brings together, and focuses so many benefits and advantages, to everyone involved, it immediately infuses the converting operation with energy, enthusiasm, and excitement.

If you examine a professional craftsman, they possess a range of abilities, and talents, and competence, of which diemaking and diecutting are only a small part of their

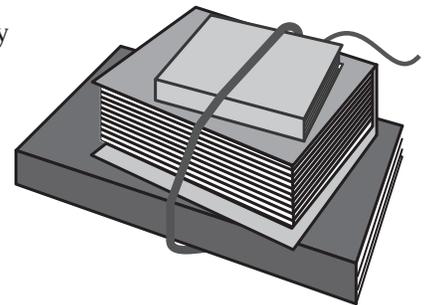
expertise. For example, it is crucial that key personnel have some competence in the following disciplines:

- * *Work Planning & Time Management skills.*
- * *Organization, Analysis & Evaluation skills.*
- * *Problem Solving & Trouble Shooting skills.*
- * *General Business Computer skills.*
- * *Communication, Writing & Listening skills.*
- * *Brainstorming, Discussion & Reasoning skills.*
- * *Basic Math, Estimating & Calculation skills.*
- * *Mentoring, Teaching & Education skills.*
- * *Leadership, Team building & Team Working skills.*
- * *First Aid & First Response skills.*

If you believe that simply teaching an individual to rule a die or to make-ready a press is sufficient, you are completely missing the point. If you want an employee to be successful, it is vital to give the employee access to all of the education tools they need to succeed.

We make far too many education assumptions about the ability and the potential of employees, which often blows up in our faces at the most inconvenient time.

What is training? It is the knowledge to succeed in a specific endeavor. But do you really think all these other skills and abilities listed above are irrelevant? And of course we are not trying to teach people to be expert mathematicians, or to be able to write the great American novel, or to organize the entire manufacturing process, but we do need basic competency in all of these attributes if the individual is to fulfill a



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productive role in all of our future.

As we take a more pragmatic view of our education and training goals, it is an obviously important benefit to any diemaker and diecutter to know as much as possible about the supplier processes, the customer cartoning-packaging application, the application the diecut products are applied to, the paperboard they use every day, the converting process they work in, and the meaning of the terminology everyone uses.

By taking a more comprehensive approach to training and education, we will gain the commitment of

the individual, we will gain their enthusiastic support, and we will develop more effective craftsmen and women, who have the knowledge and the ability to transform the system of manufacturing.

The Power of Teaching & Education: Problems & Solutions

"Instruction does not prevent waste of time or mistakes; and mistakes themselves are often the best teachers of all." — James Anthony Froude

To perform well an employee needs to be well educated, not just well trained. In addition to specific tasks and work duties, the employee is often required to read instructions; to write and record basic production information; to receive direction from or to give direction to other team members; to communicate with colleagues; to investigate, to analyze, and to solve problems; to perform process control calculations; to plan work activity; and to conduct a basic close-out of each job.



Most training programs teach hands-on procedures and ignore or assume every employee will somehow develop these skills by osmosis. This is obviously a serious oversight. Every new employee, whether recruited directly from high school, from college, or from

another company, has to have a solid foundation upon which skill, knowledge, and technical competence can be

built.

It is also important to recognize the new employee is not just being trained, but retrained as we teach new behavior and modify old behavior. The development of an effective employee with an outstanding range of skill and knowledge is clearly an ongoing journey, rarely a destination. To quote Harvey Miller; *"It's a company's responsibility to allow each individual to be as good as he or she is capable of being. I never heard anyone walk out of this building and say "Boy I feel great!! I did a lousy job today!"*

The partnership of employee and employer is a mutually inclusive commitment to support each other in achieving specific goals. Clearly the format for aligning the goals of both parties is an appraisal process. The uninhibited exchange of ideas in an effective appraisal procedure, provides both the employee and the employer with a more accurate picture of where the person is, where the person is going, and what education and training tools are required to make sure they get there.

Training and education are inextricably integrated, and by only focusing on one technical aspect of the real need of the trainee, we often undermine any potential success for the individual.



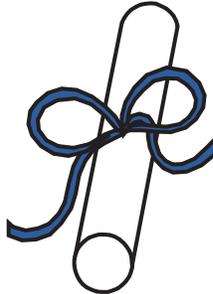
PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

The problem we face are work teams, made up from individuals who have an uneven distribution of knowledge, skill and experience, and as a result execute their tasks inconsistently in terms of speed and quality. What are the symptoms of this lack of competence?

- * Unbalanced attitudes and work habits.
- * Irregular speed of learning from experience.
- * Inconsistent application of procedures.
- * Variable analytical skills.
- * Unreliable basic data management collection.

- * *Inability to consistently plan and organize.*
- * *Erratic performance in assessing work instruction.*
- * *Uneven communication and language skill.*
- * *Patchy analytical & problem solving skill.*
- * *Highly resistant to progressive change.*

In my experience, and in the majority of cases, many performance problems or a stubborn resistance to change, are not caused by a bad attitude, but by a missing piece from each employees education portfolio. People will lose their jobs rather than admit they lack some key basic knowledge to perform key tasks.



- *How do we know, what they know?*
- *How do we know, what they don't know?*
- *How do we know what they need?*

Failing to find out the specific education needs of each key individual, right from the beginning, is the real problem.

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

We are more and more frequently driven to build or to augment existing teams from a workforce consisting of different nationalities, different cultural experience, different education standards, different attitudes, different languages, different age groups, and different genders.

Making the assumption, that all that is necessary to put a winning team together is to teach them the technical requirements of the job, is a monumental mistake.

For example, if you just consider the terminology used in the Converting Industry. This is unique language, using arcane words, terms and expressions, and a measurement system which is difficult to absorb. As this

Problem Solving	
1	Define the symptoms of the problem
2	Analyze the problem, identify all relevant factors, and get the facts!
3	Clearly state the problem to define and limit the problem solving process
4	Establish criteria and benchmarks for potential solutions
5	Brainstorm all possible alternatives, ideas, and suggestions
6	Weigh, evaluate, and select the most pragmatic solution
7	Plan the implementation, monitoring, and measurement of the solution

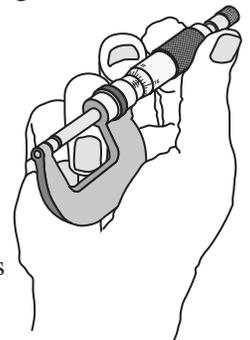
is critically important to their daily activity, we have an introductory program and documentation in place called Diemaking & Diecutting Terminology?

Sure you do!

For example, Problem Solving is a specific skill, with a specific structure, and well defined methods and practices, which when learned, lead to more effective trouble shooting. Do we teach this discipline?

For example, various forms of measurement and measurement tools are important to daily activity. Do we teach the measurement discipline, and how to use the measurement tools?

For example, many of the people involved in the team have different ethnic and cultural backgrounds, and have different expectations of their teammates and their behavior. Do we deal with these issues?



We have to establish and/or build a foundation of basic education skill and knowledge, and provide the teams with the time and the resources to learn and to succeed.

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

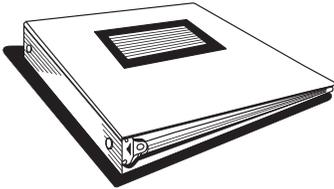
The obvious solution is to conduct an initial appraisal with a new employee, a regular annual appraisal with an existing employee, and an ongoing appraisal by the Facilitator, if one is involved, or team leaders or the department supervisor. This should be a positive experience and the appraisal process must be defined as the organization making an effort to find out what the employee needs in terms of training and education, and in how the company can provide the internal and external resources to help the employee succeed. Therefore, we need to:

- *List & Prioritize the Education/Training needs.*
- *Develop Internal & External Education Resources.*
- *Organize & Schedule Program Implementation.*

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→ Assess and Evaluate results.

The majority of the business, industrial, and general education programs required for manufacturing work teams can be purchased as self administered, stand alone Video or DVD programs, or they can be executed directly from an Education Provider web site, with a license key. The programs are excellent for Slack Time Projects, and they can be executed at home or on company time.



There are a number of other pragmatic and relatively low cost options. Many local Technical Colleges or Universities provide this general form of education,

and it is very effective to retain a teacher/lecturer from one of the institutions on a part time basis to conduct regular programs at the company.

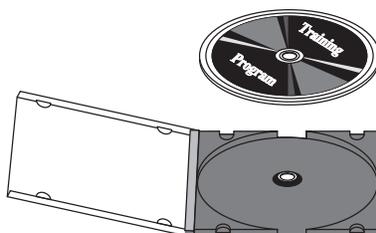
Of course, where possible the employee can attend an external standard program, if this is practical or possible. The company should provide a credit for the program, with full re-numeration based upon attendance and accomplishment.

Naturally, if a team member is unwilling to cooperate or to participate in a program they clearly would benefit from, this should trigger a different form of assistance!

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

The is where the word "**Power**" in the title of this section, the "**Power of Teaching & Education,**" comes in. It is important to remember, we are all students, and we are all teachers; we all have things we need to learn and we all have knowledge we are capable of sharing. Any organization is a collection of individuals with an extraordinary range of knowledge and ability, experience and skill. The majority of these people are perfectly capable and often enthusiastically prepared to share their knowledge.

Teaching and training is one of the most important methods of consolidating and expanding your own knowledge, and of reenergizing your competence. This is also a wonderful



tool to break down barriers, to forge new relationships, to build teamwork and unity, to accelerate the assimilation of each person into the organization, and to provide each individual with a mentor to guide growth and learning.

Company Training Program

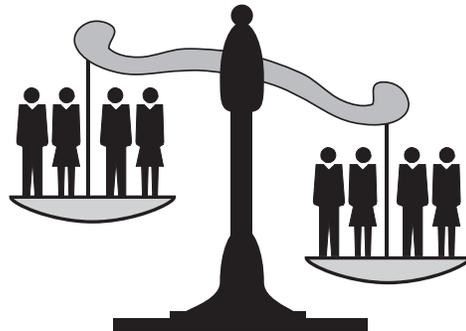
The Function of each Department

- Sales
- Customer Service
- Structural Design
- Graphic Design
- Printing
- Pre-Press
- Estimating
- Scheduling
- CAD-CIM
- Plate Making
- Diemaking
- Diecutting



Many companies have developed exceptional training and teaching of basic business and industrial education programs, using existing personnel from every level of the organization.

One of the most innovative methods of getting this program underway is to "**Train-the-Trainer**" in the use of PowerPoint, and to develop consistent "**Company**" PowerPoint templates to simplify the preparation, organization, and delivery of great programming. This greatly simplifies the initial concern over developing program content.



The Goals of The Power of Teaching & Education

"If you are planning for a year, sow rice; if you are planning for a decade, plant trees; if you are planning for a lifetime, educate people." ~Chinese proverb

The goals of implementing an effective education and teaching program is equality of opportunity for everyone in the organization.

We also have to be realistic and recognize our society has changed and is changing. Loyalty, longevity, and commitment to a single organization, and a "**job-for-life,**" is no longer the prevailing ideology.

Education standards have fallen, and we are falling behind our global competitors in key and critical subjects. And manufacturing is no longer an attractive option when people are seeking long term employment. So we have to be realistic and adopt a more pragmatic and a more aggressive approach to the education of our work teams.

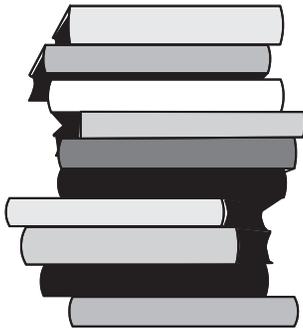


The goal is parity. “Getting everyone to know what everyone already knows.”

The goal is unity. Getting everyone involved in a common cause, and in sharing knowledge, information and experience.

The goal is teamwork. We do not have the option of picking and choosing from an unlimited personnel resource, so we have to be prepared to select personnel who can be taught, and who can be trained.

The goal is assimilation. By implementing a positive education initiative at every level of the organization, we make it easier and easier for individuals, for teams, and for the entire company to succeed.



The goal is success. By sharing our knowledge with all of our colleagues we all benefit, we all learn, and we all improve our prospects, our status, and our security.

It is also useful to remember the comments by Jeffrey Hallet; “Everyone we hire will have to be retrained three or four times during the normal employment period. The alternative ... is constant turnover, replacing the workforce, every five years or so.”

**The Power of Teaching & Education:
Methods & Practices**
“Men learn while they teach.” ~Seneca

Teaching, training, sharing experience and coaching are an almost universal by-product of a well designed team format, and full support of team activity by the Manage-

ment Team. However, there are two key obstacles to implementing methods and practices which promote and encourage mutual education.

The first is the often strongly held perception by key technicians, that sharing their knowledge, their skill, and their experience with their colleagues, has minimal personal benefit, and has a significant downside.

They may regard this type of initiative as making everyone as smart as they are, without these people paying their dues, in terms of hard won experience; and it may result in degrading their status, and in reducing their security.

The second is the powerful stigma and even the shame of admitting to a less than complete education, and/or an inability to master knowledge and skill, which others competing for job security may already possess.

This is much like the fable of the Kings Clothes, in that very few are brave enough to talk honestly about these issues, and many are content to pretend to be competent, and try to get by while they struggle to learn and to survive!

Implementing a broader education base for the work teams is not a complex or difficult to organize discipline, however, what is complex and challenging, is in overcoming these basic prejudices.

Therefore, the key methods and practices which really matter, are the dialogues, the communication, and the positive and respectful manner in which this subject is broached with the workforce. We need to prepare the ground carefully, and give everyone involved time to get used to the idea, to voice and discuss their concerns, and to get everyone onboard.

**The Power of Teaching & Education:
The Benefits of Change**

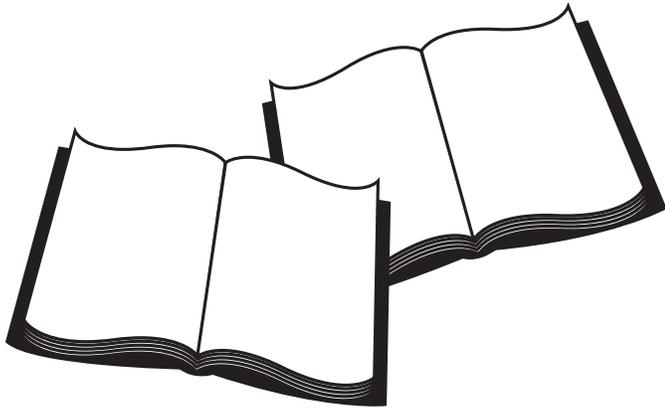
“Acquire new knowledge whilst thinking over the old, and you may become a teacher of others.” ~Confucius

The benefits of integrating the teaching of general business education subjects into standard technical training programs, is faster and better performance, greater con-



The ABC's of Fast Diecutting Press Changeover!

sistency and uniformity, and more effective teamwork. Through the use of an individual education appraisal process, the programs can be narrowly focused using rifle like accuracy, rather than the shotgun effect of more general programs. By focusing on specific needs in this manner, we can customize individual program content to deliver maximum benefit in the shortest possible time. As we are creating an education system in which there are many potential instructors and coaches, much of the training can be coordinated and implemented through team mentoring.



The power of this personal education initiative, is it reinforces the knowledge and the skill imparted and helps the teacher to be more proficient in the subject he or she is teaching. The benefits are significant. We get everyone involved, we get everyone talking, and we get everyone working closely together.

Once the barriers to this “*taboo*” subject are broached, and everyone has developed or is developing a greater comfort level with the process, sharing of knowledge, skill and information become endemic.

People want to succeed. And if they feel secure, respected, and appreciated for their expertise, they become education fanatics and drive the program faster and faster.

The Power of Teaching & Education:

Recommended Actions

“A great teacher never strives to explain his vision. He simply invites you to stand beside him and see for yourself.” ~Reverend R. Inman

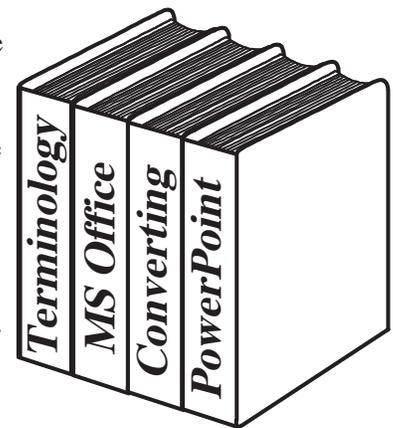
The steps in implementing a general business education initiative, will obviously vary based upon the type of organization and their current mix of personnel. However, an effective approach would include the following steps:

- ➔ Present an outline of the project and the education initiative to the entire workforce.
- ➔ Present an outline of the plan of action and the key steps in the project.
- ➔ Ask everyone to think about the education initiative and to be prepared to give feedback as the project is developing.
- ➔ Develop a provisional Education Appraisal Format and distribute the form with the date and the agenda for the next company meeting.
- ➔ Hold the second company meeting and solicit feedback on the appraisal format and the process.
- ➔ Limit the scope of the project by conducting education appraisals of one group or department, which preferably volunteered for the analysis.
- ➔ List and distribute education need and opportunity.
- ➔ Review the list of education programs with the team, and together develop a priority.
- ➔ Develop Internal & External Education Resources.
- ➔ Develop a PowerPoint Template for the creation of program materials.
- ➔ Provide PowerPoint Training and Technical Assistance to Trainer’s who are developing programs.
- ➔ Develop the first education/training program.
- ➔ Implement the program.
- ➔ Conduct a program evaluation with the participants, and adjust the

system of training where necessary.

Each company will have different needs and will certainly develop many different methods and practices to accomplish the same education goal.

“The secret of effective education lies in respecting the pupil.” Ralph Waldo Emerson



Section Four:

The Power of the Teaching & Education : Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ A majority of companies regard a sound technical training program as an important strategic goal, even though a perceived lack of time, lack of resources and of lack organizational ability, continually undermines any attempt to get an effective program off the ground. Their continued survival, however uncertain, seems to reinforce a notion, that while training is important, it is not essential, it is not a short term solution, nor is it the key to increased productivity and profitability.
- ✓ The reason we continue to struggle, is we are trying to set-up a narrow technical training program, which has limited benefits to the trainer and to the participant. What we are missing is the power of teaching and of education, which brings together and focuses so many benefits and advantages, to everyone involved, it immediately infuses the converting operation with energy, enthusiasm, and excitement.
- ✓ If you believe simply teaching an individual to rule a die or to make-ready a press is sufficient, you are completely missing the point. If you want an employee to be successful, it is vital to give the employee access to all of the education tools they need to succeed.
- ✓ We make far too many education assumptions, about the ability and the potential of employees, which often blows up in our faces at the most inconvenient time.
- ✓ In addition to specific tasks and work duties, the employee is often required to read instructions; to write and record basic production information; to receive direction from or to give direction to other team members; to communicate with colleagues; to investigate, to analyze, and to solve problems; to perform process control calculations; to plan work activity; and to conduct a basic close-out of each job.
- ✓ The problems we face are work teams made up from individuals, who have an uneven distribution of knowledge, skill, and experience, and as a result, execute their tasks inconsistently in terms of speed and quality.
- ✓ It is important to remember, we are all students and we are all teachers; we all have things we need to learn and we all have knowledge we are capable of sharing. Any organization is a collection of individuals with an extraordinary range of knowledge and ability, experience and skill. The majority of these people are perfectly capable and often enthusiastically prepared to share their knowledge.
- ✓ In my experience, and in the majority of cases, many performance problems or a stubborn resistance to change, are not caused by a bad attitude, but by a missing piece from each employees education portfolio.
- ✓ The appraisal should be a positive experience and the process must be defined as, the organization making an effort to find out what the employee needs in terms of training and education, and in how the company can provide the internal and external resources to help the employee succeed.
- ✓ The power of this personal education initiative, is it reinforces the knowledge and the skill imparted, and helps the teacher to be more proficient in the subject he or she is teaching. The benefits are significant. We get everyone involved, we get everyone talking, and we get everyone working closely together.

Section Four:

The Power of the Teaching & Education : Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ What is Training?
 - ✓ What do you believe are the sources of our struggle to implement effective knowledge and skill development programs?
 - ✓ Name three General Business skills that you or your colleagues would benefit from advanced instruction?
 - ✓ How has your organization made and documented and assessment of the education requirements of your position?
 - ✓ Other than your specific job, what other disciplines have your received training or technical instruction in?
 - ✓ Name three causes for variation in individual and in team performance?
 - ✓ What are the three education and knowledge assessment questions, every new employee should be asked?
 - ✓ What are the seven steps in problem solving?
- ✓ What is the first step in making an assessment of the training and education needs of each of your colleagues?
 - ✓ How have you participated in a training or an instruction session as an official or as an “unofficial” trainer?
 - ✓ Have you received Train-the-Trainer, training to develop and to improve your skills as a trainer?
 - ✓ Are you familiar with the PowerPoint Presentation Program, have you ever used the program, and have you experienced a PowerPoint Training Program?
 - ✓ What is the primary goal of implementing a comprehensive education and training program?
 - ✓ How do you feel about discussing your and your colleagues education and training needs with your colleagues?
 - ✓ Have you personally invested in any formal or informal training or education program outside of your employment?
 - ✓ Do you feel you have all the education and training tools, and the time and the opportunity to develop and enhance your technical and general business skills?

Manufacturing System of Organization

Section 05: Training & Skill Development

Key Definitions: Training... *the process of teaching or learning a skill or a job ... to undergo training or instruction in preparation for a particular role or function ... to make proficient with specialized instruction and practice ... an activity leading to skilled behavior ... to prepare or be prepared for a job or an activity by learning skills and/or by mental or physical exercise ...*

The Training Mission Statement: *“It is the mission of the organization to develop, to sustain, and to continually upgrade a system of training, re-training, and cross-training, to develop optimal performance and parity, to develop procedural consistency and uniformity, and to develop optimal individual and team knowledge, skill, confidence and competence.”*

Training & Skill Development:

An Overview

“In theory, there is no difference between theory and practice; In practice, there is.” ~Chuck Reid

Many managers are concerned about the training dilemma they face. Whilst all recognize the necessity of improving the knowledge and the skill of the workforce, the apparent complexity of designing, implementing and managing an effective training program represents a complex challenge.

With no neatly packaged solutions available, coupled with limited time and resources, and ever present cost constraints, the frustrating cycle of inconsistent performance, seems an insurmountable barrier to productive improvement.

In reality, we have a system of training in-place! And however imperfect and how poorly organized, it does enable the departments to function at a basic level. The primary problem with the existing skill development programs is they are poorly documented, they are inconsistently executed, they produce unpredictable results, and the resulting performance is difficult to manage and impossible to reliably control.

To repeat we have a training system in place, which produces good results more often than not. However, we need to standardize, we need to stabilize, and we need to

establish benchmarked practices and procedures, which represent, the best ideas of everyone involved in the work team.

The following quotation has been used numerous times throughout the manual, because it is such an important principle of effective manufacturing. It states, the goal is;

“To get everyone to know, what everyone already knows!”

If we can accomplish this more even distribution of competence, we will have stabilized the current system of manufacturing, we will have built a foundation of consistent execution, upon which we can steadily get better. In seeking to continually upgrade methods, practices, and performance, it is essential we gain all of the knowledge and the experience we can from every production cycle. And, to make sure we do not end up where we currently are, we need to ensure there is an ongoing daily consolidation of knowledge, ideas, and solutions, between everyone involved in each key process.

We need to standardize, we need to stabilize, and then we need to aggressively seek daily step-by-step improvement. The majority of the knowledge, the skill, and the experience we need to be a World Class organization is already in place, we just need a better way of focusing it. As Thomas Mann stated; *“Order and simplification are the first steps toward mastery of a subject---the actual enemy is the unknown.”*

The Job Description/Structure

01	A Job Description <i>(What has to be done)</i>
02	A Work Structure <i>(How these activities are executed)</i>
03	Work Planning Guidelines <i>(Daily planning & organizing)</i>
04	Operating Procedures <i>(How these activities are performed consistently)</i>
05	Goal Setting <i>(Systematic improvement objectives)</i>
06	Measurement Criteria <i>(How performance will be measured)</i>
07	Problem Solving <i>(Trouble shooting & contingency procedures)</i>
08	Improvement & Innovation <i>(Individual & team development goals)</i>
09	Reporting Structure <i>(How information is collected & used)</i>
10	Appraisal Process <i>(How & when the position will be evaluated)</i>

Training & Skill Development:

Problems & Solutions

“Instruction does not prevent waste of time or mistakes; and mistakes themselves are often the best teachers of all.” ~James Anthony Froude

Training in it's most basic form, is the development of a specific behavior to enable the consistent execution of a previously approved task. Therefore, training should result in the employee being able to do something he or she was not capable of before. Or the re-training process should cause an existing behavior to be modified to enable the execution of an updated standard procedure, which represents the best of the best of the entire work team.

Any manufacturing process can be logically defined in terms of a collection of duties, designed to accomplish a specific task.

Each of these individual tasks can be analyzed and defined as a series of discrete, sequentially performed steps, logically grouped together, with a beginning and an end, aimed at achieving a specific result.

For example, if we analyzed a manufacturing function, such as pre-press make-ready, the process can be defined as a series of standard operating procedures that must be accomplished to complete each make-ready preparation cycle.



A Standard Operating Procedure is ... A written document that details the method for an operation, analysis, or action with thoroughly prescribed techniques and steps, and that is officially approved as the established method or instructions for performing certain routine or repetitive tasks.

The standard operating procedures are performed by the team members, as they each execute their role in the preparatory cycle.

Therefore, we can logically organize the functions and tasks of diecutting, as the execution of a series of standard or current best operating procedures, designed to generate a specific outcome. In addition, we can define

individual and team knowledge, skill, and competence, as the ability to successfully complete the standard operating procedures, represented by each key activity.

In reality, we have standard operating procedures in place. The problem is everyone uses a different procedure, the procedures are not performed in a consistent manner, nor often in a logically

uniform sequence.

This is our first, and frankly the most difficult training obstacle to overcome!

To replay another quote from earlier in the manual, in my initial instructions when training or re-training work teams I state; *“You can complete this specific task in any way you want, as long as everyone is doing it in the same way!”*

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

The performance problem in diecutting is not that we are unable to do things, the problem is each individual does things differently, each person applies different knowledge and uneven standards and questionable criteria to complete the execution of a task, with the result that everyone generates different results, every time!

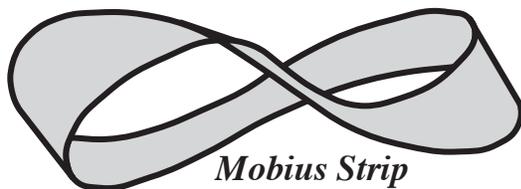
This results in several performance problems:

- ➔ Significant variation in knowledge, skill and experience from one individual to the next.
- ➔ Performance improvement is slow and uneven.

- Team members are not interchangeable.
- Unpredictable performance in key process activities.
- Variable output quality from one individual to the next.
- Variable production output from one individual to the next.
- Significant variation in performance from one individual to the next.
- Variation in speed to market, turnaround, throughput and cycle time, are making the organization none-competitive.
- Variation in performance, coupled with low yield are undermining cost competitiveness.
- Slow and unpredictable changeover performance is our Achilles Heel.
- We have no effective system of training to change the status quo.

In principle, the Converting Industry supports an aggressive investment in skill development and training, but emotionally it finds it difficult to commit to something which does not immediately impact the bottom line.

Training programs are started, however, if there is a slowdown, which is the perfect time to train, cost cutting is the survival mode, and expenditure on training are eliminated immediately. When the company is busy, and the money is available for training, naturally the work must be done, and there is no time for training!



Möbius Strip

This is like a Möbius Loop, no matter which side you choose, after all the twists and turns, you are basically in the same position you started in. **But we have to change!** As Albert Einstein defined the problem as; *“Insanity is*

doing the same thing over and over again and expecting different results.”

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

The majority of established diecutting organization already have the knowledge, the skill, and the experience to perform far more effectively than they do on a regular daily basis. However, each person has a different level of skill, a different approach to the process, and a different understanding of what works and what does not work. If we could amalgamate all of skills of all of the individuals into a single person, we would have one of the most accomplished diecutting technicians in the world.



The cause of our problem is:

- 1: There is no mechanism to define or to record the most effective methods and procedures.
- 2: There is no system of measurement to evaluate & compare one procedure to the next.
- 3: There is no structure to enable the sharing of ideas, techniques and solutions.
- 4: There is no discipline designed to enforce a consistent approach to the process.
- 5: There is no method which enable standards to be set, to be evaluated, & benchmarked.
- 6: There is no coordinator, or facilitator, or dedicated leader, to focus the talents of the workforce and to build a team approach to diecutting-converting.

Therefore, the obvious causes of the problem of poor and inconsistent performance, is a lack of leadership, a lack of teamwork, a lack of focus on standardization and benchmarking, and the lack of procedural consistency.



The ABC's of Fast Diecutting Press Changeover!

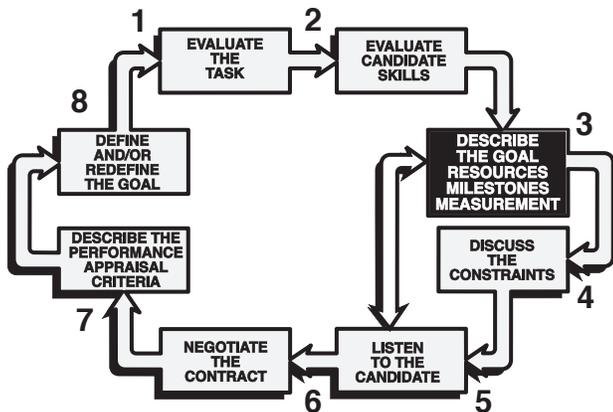
It should be obvious by now that we need to level the playing field. We have simply too much variation in methods, techniques and by practices, from one job to the next, by the same individual, and the same inconsistency exists from individual to individual.

Traditions in our industry have always focused upon individual knowledge, skill and experience, however, they did this in a time where the process was simpler, everything was slower and easier to assimilate, and profitability enabled investment in teaching and training.

We have to find a more effective method of standardization, of stabilization, and of building knowledge, skill, and experience unity throughout the work team.

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

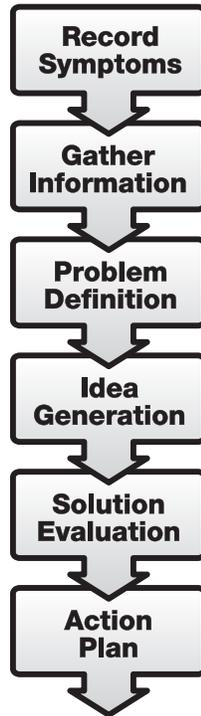
It is obvious we are facing a radical change in the way we do things. However, if we adopt a plan of action, which reflects the reality of the daily race against the clock, and which builds a team approach to manufacturing, we are more likely to succeed. So let us begin!



STEP 01: Selecting the Project Leader

Do we need a dedicated project leader?

Designing each team structure, selecting teams, choosing team roles, developing an effective operating structure,



managing and scheduling team activities, and resolving all of the inevitable early problems, requires the assistance of someone who is experienced in the field. From problem solving to brainstorming, to organizing and holding successful meetings, to keeping everyone up-to-date and resolving disputes, is a full time job.

Therefore, we need to select a Project Leader or a Facilitator, who will plan, organize and guide the work teams through the implementation of this program.

STEP 02: Forming Work Teams

To achieve sustained productive improvement, we have to break through established behavioral patterns, we have to eliminate barriers to communication and the exchange of ideas, we have to encourage people to take greater responsibility, we have to persuade everyone to base their success on the success of their colleagues, and obviously level the knowledge, the skill, and the experience playing field.

Teamwork is the most effective tool to achieve all of these things and to surmount many related challenges as we develop a new system of working.

We must form teams.

STEP 03: Company Wide Communication

This project represents a fundamental change to the way we do things, so it is not just important to inform the work team impacted by the new system, but everyone in the organization.

In addition, all of the management team, and the supervisors and senior managers from the entire company should attend this meeting to demonstrate the unequivocal support for the project.

STEP 04: Analyze the Process

The **FIRST** Step in creating an effective training system is to break the process down into the major functions or areas of activity. These could be:

- Work Planning.
- Production Toolmaking.
- Pre-Make-Ready.

Standard Operating Procedure Title			PLATEN DIECUTTING: PRESS FOOTPRINTING						
SOP #:	04-05	Version #:	04.2	Department:	Pre-Press & Diecutting	Discipline:	Press Make- Ready	Page #	4.1
Inception Date?	22-04-05	Update?	11-09-05	Approved by?	Ron Baker	Trainee?	TLK	Trainer?	RLB
		Training Date?	June 05						
Step	Action	Comments	Safety	Speed	Quality	Activity Time	Elapsed Time	Cost:	
1	Position the paper, squarely on the cutting plate, aligned with the leading edge of the plate, and tape securely.	Tape corners only, of the new Press Mapping Sheet, to create a flat taught sheet.	✓ Team Alpha	✓ Team One	✓ Team Driven	03 Minutes	03 Minutes	\$75 \$75	
2	Position a sheet of carbon paper, face down on the paper, completely covering the sheet.	Use 0.005" Bar-Plate Carbon Paper	✓ Team Alpha	✓ Team Driven	✓ Team One	03 Minutes	06 Minutes	\$75 \$150	
3	Using previously recorded pressure, gradually increase press tonnage, until the knives begin marking the patch-up sheet.	Keep a Pressure Record for every setting in the footprinting sequence	✓ Team One	✓ Team One	✓ Team Driven	05 Minutes	11 Minutes	\$125 \$275	
4	Mark the Outer Impression Perimeter or Outer Layer of the first pressure level.	Use a Black Felt Marker to mark the first Pressure Layer	✓ Team Alpha	✓ Team One	✓ Team Driven	07 Minutes	18 Minutes	\$175 \$450	
5	Increase pressure slightly, record the pressure setting and take a second impression	Make a note of the pressure setting, and add the setting to the Press Mapping Sheet.	✓ Team Alpha	✓ Team Alpha	✓ Team One	02 Minutes	20 Minutes	\$50 \$500	
6	Using a different colored Marker, outline the second pressure layer.	Use a Red Felt Marker to mark the second pressure layer.	✓ Team Driven	✓ Team One	✓ Team Alpha	03 Minutes	23 Minutes	\$75 \$575	

- ➔ Press Changeover.
- ➔ Diecutting Production
- ➔ Diecutting Quality Management

The **SECOND** step is to prioritize and analyze each function into primary areas of expertise. For example, in toolmaking this would include, diemaking, stripping, blanking, ejection, nicking, etc.

The **THIRD** step is to define and identify all the disciplines within each function that can be defined as separate activities, with a well defined start and a completion. These should be defined as Standard Operating Procedures.

The **FOURTH** step is to define and specify the specific employee roles within each function. These could include:

- ➔ Diemaker.
- ➔ Pre-Press Technician.
- ➔ Changeover Technician.
- ➔ Press Operator.
- ➔ Press Assistant.

The **FIFTH** step is to select a format for collecting and organizing the steps, the description of each step, and the

benchmark time standard for each procedure.

The standard operating procedure format is illustrated above, and discussed with more detail in Section One.

STEP 05: The Training Map

The Training Map derives its name from the manner in which the entire knowledge and skill development program for every team member, is integrated into a single chart for every personnel classification. *See the illustration on the next page.*

In practice, in many operations, there is a logical training and promotion progression from press assistant to pre-press technician, to press operator, and therefore, the entire employee progression can be incorporated into a single management chart.

The chart should begin on the top left hand side, with the most basic procedures a novice would begin to learn, and progress from left to right across the chart, with increasingly more difficult tasks/procedures, to enable the creation of the training grid.

The grid is used to classify the training status of each team member in four ways:

Stage 1: Not Trained

The grid is not marked in any way, and this simply designates the trainee has not received any formal training in the specific discipline or procedure.

The ABC's of Fast Diecutting Press Changeover!

Job Position	PRESS ASSISTANT						PRESS OPERATOR										PRE-PRESS OPER									
Task Category	General Duties						Pre-Press		Press/Area Purge			Changeover					Pre-Make-Ready									
STANDARD OPERATING PROCEDURE	Department Safety Procedures	Housekeeping Duties	Trucking	WIP Handling	Loading the Press	Removing Diecut Loads	Analyze Job Information	Verify Tools & Materials	Coordinate with Pre-Press Function	Purge Area	Lock-Out Procedures	Drain/Flush Tooling	Preventative Maintenance	Press Component Cleaning	Install Die/Chase	Install Cutting Descplate	Install Patch-Up Sheet	Install Female Stripper	Install Male Stripper	Install Die/Chase	Install Cutting Descplate	Install Patch-Up Sheet	Install Female Stripper	Install Male Stripper	Install Male Pins	
John Smith																										
Mary Jones																										
Susan Anthony																										
Peter Carew																										
Julio Sanchez																										
Angela Green																										
Andrew Barry																										
Teresa Brandon																										
Miguel Garcia																										
Steven Roberts																										
Warren James																										
Margaret Devon																										
Philip O'Tbol																										
Miguel Gonzalez																										
Jim Webb																										
Ray Webber																										
Keith Richards																										
Christine Rhodes																										
Julio Herrera																										

Stage 1 Not Trained Stage 2 Partially Trained
 Stage 3 Fully Trained Stage 4 Performance Proven

Stage 2: Partially Trained

The grid is marked with a single diagonal line, which indicates the trainee has undergone formal training to develop the skills in the specific procedure, but has not had sufficient time to perfect the task behavior.

Stage 3: Fully Trained

If the grid is marked with two diagonal lines, which indicates the trainee has undergone formal training, and has had sufficient time and assistance to develop the behavior, and complete the task a number of times, without supervision, the trainee is considered to have been trained in the specific discipline.

Stage 4: Performance Proven

This final classification is marked with a vertical line added to the two diagonal lines. This indicates the trainee has undergone a supervised analysis of his or her performance by one of his or her peers, and the trainee demonstrated a level of competence considered acceptable.

Performance Qualification

This simple but pragmatic approach to performance assessment is structured around the creation of standard operating procedures. These important tools, task guidelines and performance benchmarks are the foundation of a productive operation.

Therefore, to train any person in any field, it is necessary to break the task down into the following criteria:

- * Sequence & Number each Step
- * Describe the Step Action
- * Add Comments & Guidelines
- * Safety Approval & Sign Off
- * Speed Approval & Sign Off
- * Quality Approval & Sign Off
- * Step Activity Time Record
- * Step Elapsed Time Record
- * Step Cost Calculation (Activity and cumulative cost.)

TASK PERFORMANCE EVALUATION: PROCEDURE: Leveling The Impression																																																			
Trainee:	Evaluator: Date:																																																		
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Examine the back, and the front of the diecut sheet for full penetration, and pressure variation, and mark the low areas.	Comments/Suggestions																																																		
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Select appropriate area patch-up material and tear to the shape(s) of the low pressure areas.	Comments/Suggestions																																																		

The tool we use to define the task work structure is the **Standard Operating Procedure**, the tool we use to organize the entire training program and the trained status of each team member is the **Training Map**; and the tool we used to certify each team member, to indicate they are proficient in the procedure, is the **Performance Evaluation Guide**. See above.

In unifying process improvement and training through the use of consistently applied procedures we close the development loop by creating an evaluation format based upon the performance of each step and the successful completion of the entire procedure.

The task performance evaluation chart is created using the same sequence of steps and the same measurement criteria to determine acceptable performance. The classifications for each are Unsatisfactory, Marginal, Good, Very Good, and Excellent.

In addition, the measurement of how well each step is performed is graded from 1-25, with the total being multiplied by 4 to give the performance percentage for each step. Clearly, as part of the creation of the standard

operating procedure, the training map, and the evaluation form, the level of acceptable performance for each step and for the entire procedure, must be pre-determined and precisely defined.

In summation, the key to the **SOP**, the **Training Map**, and the **Performance Evaluation Guide**, is they are prepared, they are organized, and they are implemented by the work team themselves. The advantages of providing the work teams with their own, self administered, comprehensive system of training, is it is based upon daily activity, and the activities which really matter in the process.

The simplicity of the program, and the fact that it is controlled by their peers, gives the team member confidence in the accuracy and the fairness of the training system.

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

The creation of the Training Map and related documentation and certification tools will provide the solid founda-

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tion, essential for building an effective system of training. All the steps in the process are critical, from creating the standard operating procedure, to the Training Map, to the Performance Evaluation Guide, are necessary, however, there is a more effective method of using this information to teach and to train.

Once each procedure is complete and approved by the work team, the person with the greatest proficiency in the procedure, should be videotaped executing each step in the procedure by another member of the work team. In addition, either the person executing the procedure, or the videographer, or another team member, should provide a voice over recording, to explain the execution of each step in more detail.

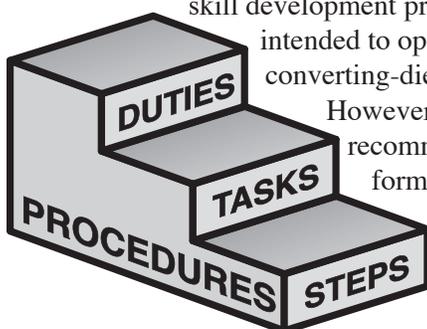
The ability to implement a training program based upon up-to-date videotapes of the execution of each procedure will greatly simplify the learning of a new skill, or the upgrading of an old skill. Just imagine starting at the company for the first time, and instead of suffering through the erratic watch-me method of learning, the trainee was given a series of approved videotapes to prepare for their shop floor experience.

This technique would accelerate learning, it would ensure training was more accessible to a wider range of people, and it would significantly reduce the cost of training.

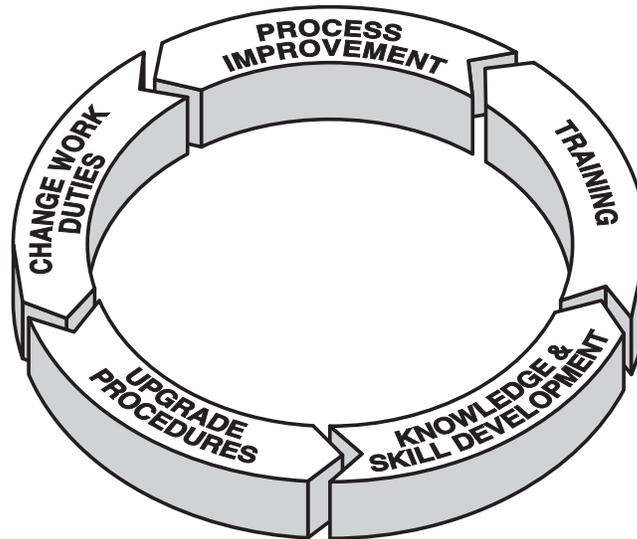
The Goals of Training & Skill Development

“Skill to do comes of doing; knowledge comes by eyes always open, and working hands; and there is no knowledge that is not power.” — Ralph Waldo Emerson

The goals of implementing an effective training and skill development program are obviously intended to optimize every facet of converting-diecutting performance.



However, the approach we are recommending, through the formation of teams and the creation of an employee driven education system, has productive



implications beyond simple training.

Manufacturing is a continuous cycle or loop of activities, and while the production work changes from cycle to cycle, the basic process and the challenges we face remain the same.

The execution of a training program changes the understanding and expands the knowledge of the trainee.

This wider perspective and additional information, inevitably leads to process improvement, which demands an adjustment or a change to current duties.

As a result, procedures are upgraded, which exposes new challenges, different problems, and leverages a higher standard of performance. This change to the methods and practices, requires the existing standard operating procedure to be upgraded to reflect the new experience, which leads to re-training, and the cycle continues.

If we create an effective team operating structure and if we have created an effective team environment, we will have also created a system of process improvement, which will continually raise performance standards.

Ongoing daily analysis, experimentation, research, and problem solving become an addictive discipline, which makes the work of diecutting simpler, less stressful and more satisfying. In many ways the goal of this program is in reality a method to increase the self esteem of the workforce.

Training & Skill Development: Methods & Practices

“He who asks is a fool for five minutes, but he who does not ask remains a fool forever.” ~Anonymous

This is neither a short term project nor is it inconsequential. Every step forward will improve the productivity of the work teams and of the operation. However, the project has to live with and be integrated with daily production, which will always take the highest priority.

Therefore, even though the project justifiably starts with a

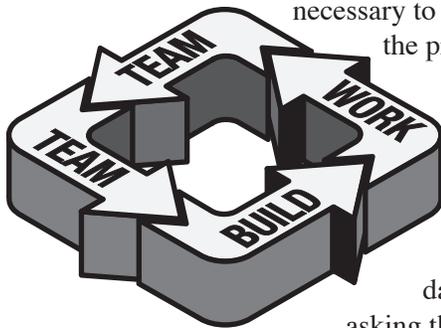
fanfare, do not try to too much too quickly. Work on two or three key standard operating procedures at a time. The organization did not get into the current position overnight, and it will take time to change the entire structure of daily work. Many initiatives have failed because we try to do too much too quickly.

Why are Work Teams so Effective?

- ◆ *Team dynamics generate & accelerate problem solving, innovation, and process improvement initiatives*
- ◆ *The team interactive focus improves the communication and feedback of information*
- ◆ *The team approach simplifies and speeds up completion of complex, sequential, labor intensive tasks*
- ◆ *Teams are the most effective environment in which to build confidence, competence, and performance parity*
- ◆ *The mutually supportive competitive focus develops procedural consistency*
- ◆ *The team structure breaks down barriers and reinforces and sustains productive relationships*

However, this does not mean the project should be relegated to “fill-in” activity during slack time. The project should be scheduled in the same way and with the same intensity that production work is scheduled.

It is important to be realistic, however, it is also important to remain dedicated to this project. If the management team is seen to treat the project as not important, then you will hardly be surprised if the work teams take the same attitude. To remain energized will almost certainly require making an investment in overtime, and while cost control is always an issue, the careful use of overtime is necessary to keep the energy of the project alive.



Another very effective strategy, is to take one or two team members out of the loop for one day per week, and by asking their colleagues to

cover for them, we maintain productive output. The day or half day of working on the project will provide a valuable boost to progress, it will send an important signal to the workforce, and if the position is rotated regularly, it will be supported by the entire work team.

It also is important to work on this project in a disciplined fashion. Time spent on the project is not a “rest” period, and it should be managed, measured, and regulat-

ed like any other production activity. If we want to make progress, if we want to make this a progressive habit, we have to give the project a high priority, and attack every project activity, with the same determination we bring to any other important task.

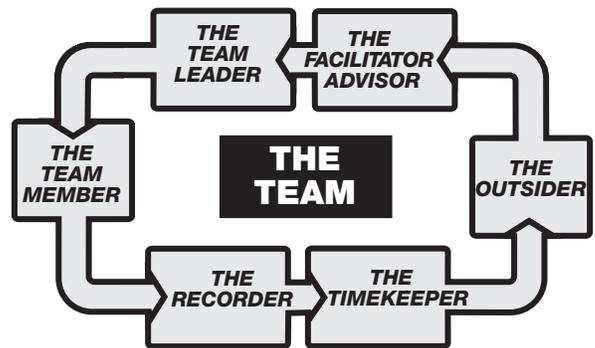
Training & Skill Development:

The Benefits of Change

“Everyone we hire will have to be retrained three or four times during the normal employment period. The alternative ... is constant turnover, replacing the work force every five years or so.” ~Jeffrey Hallet

There are numerous benefits to this approach to training and skill development. Probably the most important long term impact is upon the unity and cohesiveness of the workforce and their ability to seamlessly and flexibly function in a range of important team based activity. The fundamental principle underlying this transformation, is the entire program is based upon building and sustaining participant self esteem.

The execution of this approach to knowledge and expertise creation, not only builds competence and confidence, it builds respect, and reinforces the value of each individual. We discussed RAP, or Respect, Appreciation, and Praise earlier, and while it is important to earn and receive this return from the management team, it is even more important to gain the respect of their colleagues and team mates.



The second major advantage is obviously performance. The ability of the teams to use a virtually self administered education program to progressively improve performance is the basis for an extraordinary competitive advantage. As a key goal of diecutting-converting is low cost manufacturing, this system of world class training is a highly effective method of eliminating waste and non-value added time and activity.

The third major advantage is the ability to train and

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develop skill quickly and consistently. This will enable an effective cross training program to ensure key positions are back-up, and the ability to integrate a new employee in a very short space of time.

The project will certainly require a significant effort to get it off the ground and to ensure it is working properly, however, once established the program requires minimal management time, and it will develop a life of its own, as it becomes an integral part of daily manufacturing.

Training & Skill Development:

Recommended Actions

“There is a remarkable agreement upon the definition of learning as being reflected in a change of behavior as the result of experience.” ~E. A. Haggard

There are relatively few steps in setting up the Training and Skill Development program, however, each step is critical to the end result, and each step should be carefully executed.

The Recommended actions are to:

- 1: Select a Project Leader and/or Project Leaders**
- 2: Form Work-Project Teams**
- 3: Implement a Company Project Communication**
- 4: Analyze the Process**
 - 4.1: Divide the Process in Functional Areas and Prioritize a Development Strategy.**
 - 4.2: Divide each Function into Separate Disciplines**
 - 4.3: Divide each Discipline into Individual Activities or Procedures.**
 - 4.4: Divide the Process into Job Disciplines & Assign Procedures to each area of Expertise**
- 5: Develop the Training Map**
- 6: Develop the Performance Evaluation Guide for the First Series of Procedures**

Although there are only six steps in establishing a system

of technical education, they are the most critical steps the organization can take to fundamentally transform the system of manufacturing. There is a great deal to do at the beginning of establishing an effective training system, however, once the structure is in place, building a system of benchmarked standardized procedures, is a relatively straightforward process.

Team Member Skills

<input checked="" type="checkbox"/>	Problem Solving
<input checked="" type="checkbox"/>	Meeting Participation
<input checked="" type="checkbox"/>	Communication
<input checked="" type="checkbox"/>	Brainstorming
<input checked="" type="checkbox"/>	Making Team Decisions
<input checked="" type="checkbox"/>	Resolving Conflicts
<input checked="" type="checkbox"/>	Selecting & Evaluation Options
<input checked="" type="checkbox"/>	Making Presentations
<input checked="" type="checkbox"/>	Organization
<input checked="" type="checkbox"/>	Leadership

There is a choice between moving forward or falling behind, and your choice is...?

“Destiny is no matter of chance. It is a matter of choice: It is not a thing to be waited for, it is a thing to be achieved.” William Jennings Bryan

Section Five:

Training & Skill Development: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ In practice, there is a system of training in-place! And however imperfect and how poorly organized, it does enable the departments to function at a basic level.
- ✓ The following quotation is an important principle of effective manufacturing. It states, the manufacturing goal is; ***“To get everyone to know, what everyone already knows!”***
- ✓ It is essential to standardize, to stabilize, and the to aggressively seek daily step-by-step improvement. The majority of the knowledge, the skill, and the experience needed to be a World Class organization is already in place.
- ✓ Training in its most basic form is the development of a specific behavior to enable the consistent execution of a previously approved task. Therefore, training should result in the employee being able to do something he or she was not capable of before. Or the re-training process should cause an existing behavior to be modified to enable the execution of an updated standard procedure, which represents the best of the best of the entire work team.
- ✓ The performance problem in diecutting is not that we are unable to do things, the problem is each individual does things differently, each person applies different knowledge and uneven standards and questionable criteria to complete the execution of a task, and as a result, everyone generates different results, every time!
- ✓ The majority of established diecutting organizations, already have the knowledge the skill, and the experience to perform far more effectively than they do on a regular daily basis. However, each person has a different level of skill, a different approach to the process, and a different understanding of what works and what does not work. If we could amalgamate all of skills of all of the individuals into a single person, we would have one of the most accomplished diecutting technicians in the world.
- ✓ Traditions in our industry have always focused upon individual knowledge, skill and experience, however, they did so in a time where the process was simpler, everything was slower and easier to assimilate, and profitability enabled investment in teaching and training. We have to find a more effective method of standardization, of stabilization, and of building knowledge, skill, and experience unity throughout the work team.
- ✓ To achieve sustained productive improvement, we have to break through established behavioral patterns, we have to eliminate barriers to communication and to the exchange of ideas, we have to encourage people to take greater responsibility, we have to persuade everyone to base their success on the success of their colleagues, and obviously, level the knowledge, the skill, and the experience playing field. Teamwork is the most effective tool to achieve all of these things and to surmount many related challenges as we develop a new system of working.
- ✓ This project represents a fundamental change to the way we do things, so it is not just important to inform the work team impacted by the new system, but everyone in the organization. In addition, all of the management team, and the supervisors and senior managers from the entire company should attend this meeting to demonstrate the unequivocal support for the project.
- ✓ Once each procedure is complete and approved by the work team, the person with the greatest proficiency in the procedure should be videotaped executing each step in the procedure by another member of the work team. In addition, either the person executing the procedure, or the videographer, or another team member, should provide a voice over recording, to explain the execution of each step in more detail.

Section Five:

Training & Skill Development: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Why do you feel your organization has failed to implement an effective training and skill development program?
- ✓ What is the first action we should plan for in establishing a training program?
- ✓ What is the process of training in its most basic form?
- ✓ What is a Standard Operating Procedure?
- ✓ What is the principle weakness in how everyone currently works?
- ✓ Why do you think the reality of everyone working in a different way impacts productivity and quality?
- ✓ Do you use a system to record and to standardize procedures?
- ✓ How is procedural consistency measured in your operation?
- ✓ How do you and your colleagues exchange ideas, solutions and more effective techniques?
- ✓ Are there any methods to enable some form of standardization and benchmarking?
- ✓ Why is it necessary or important to have a Project Leader for this initiative?
- ✓ Why is the formation of work teams and project teams so critical to the successful implementation of this project?
- ✓ Why is it important to implement and initial and ongoing communication with the entire company?
- ✓ What are the first steps in analyzing the process?
- ✓ What is the Training Map and how does it work?
- ✓ What are the four training classifications in the Training Map?
- ✓ What is the tool we use to assess and certify competence in the execution of a standard operating procedure?
- ✓ What are the five performance classifications which are used in assessing performance?
- ✓ What are the advantages of videotaping approved standard operating procedures?
- ✓ How will the training program lead to continuous improvement?

Manufacturing System of Organization

Section 06: Standardize, Simplify and Streamline

Key Definitions: ... make standard ... to remove variations and irregularities in something and make all types or examples of it the same or bring them into conformity with one another ... to cause to conform to a standard ... to determine the properties of by comparison with a standard ... to reduce to or compare with a standard ... to remove variations and irregularities ...

The Standardization Mission: "It is the team mission to create, to sustain, and to continually upgrade the most effective standardized procedures and practices, with the goal of eliminating variation, inconsistency and anomalies, and to strive daily to implement the most effective, the simplest and the most efficient benchmarked system of manufacturing."

Standardize, Simplify & Streamline:

An Overview

"Greatness, in the last analysis, is largely bravery--- courage in escaping from old ideas and old standards."

~James Harvey Robinson

It is obviously important to standardize current procedures, but only as a preliminary benchmark for process simplification and the continuous paring away of superfluous steps, non-value added time, and excess cost.

- ➔ *What is the point of creating standard operating procedures, when the organization in which they are performed, is not in itself standardized?*
- ➔ *What is the point of creating standard operating procedures, when many of the steps, are repetitive duplication of unnecessary actions?*
- ➔ *What is the point of creating standard operating procedures, when the work areas are constantly changing, and are different every time?*

All these statements are true and reflect a deep seated problem in the way we structure and organize work areas. However, the creation of a Standard Operating Procedure should be re-defined as creating the Current Best Operating Procedure! This is necessary because although we create a benchmarked standard of the best of the best, now we have simply drawn a line in the sand or created a target we can compete against to find faster and simpler ways to do things.

The emphasis for this effort was succinctly stated by Ann Knight; *"The three most important things right now ... are costs, costs, and costs. And cost can be summed up in one word: Productivity."*

There should be no doubt that the end result of an effective training and re-training program must be a process

that is quicker, better and less expensive. However, the effort has to be directed at procedural simplification rather than just looking for generic poorly organized ways to "improve."

For example, any important test of an improved process, is that it must require less effort, less resources, and less time. This principle is fundamental to improvement as Charles Coulomb stated; *"To obtain the most from a man's energy it is necessary to increase the effect, without increasing the fatigue."*

Practical examples abound in our sport oriented society. Leading athletes achieve greatness when they make seemingly impossible plays look incredible simple. This type of performance is achieved by continually repeating the play and paring away unnecessary movement, by eliminating excess poorly directed effort, by careful refinement of each step, and by conserving and directing the minimum amount of energy required for a specific outcome.

Naturally, outstanding performance is the result of good coaching integrated with practice, practice, and more practice! It is obviously important to raise knowledge and skill, but it is equally critical and no less effective to lower the bar! Reducing the complexity of any task cuts time, reduces cost, lowers fatigue, minimizes opportunity for error, limits the number of inspection steps, and it requires less training and skill development.

Andrew S. Grove; *"In the first round of work simplification ... you can reasonably expect a 30 to 50% reduction. To implement the actual simplification, you must question why each step is performed. Typically, you will find that many steps exist in your work flow for no good reason. Often they are there by tradition or because formal procedure demands it, and nothing practical ordains it."*

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Standardize, Simplify & Streamline:

Problems & Solutions

“No matter how complicated a problem is, it usually can be reduced to a simple, comprehensible form which is often the best solution.” - Dr. An Wang

Defining how to execute a standard operating procedure is excellent, however, the effectiveness and the efficiency of task completion requires a detailed analysis and preparation of everything involved in the work activity. Key questions which should be asked, include:

- ➔ *Is the procedure being performed in a specialized work area, customized for the activity?*
- ➔ *Does the work area **only** contain all of the tools and materials necessary for successful completion of the procedure?*
- ➔ *How is the integration of the procedure and the work area, and all of the tools, materials, and components managed for consistency?*

Activity Time	Elapsed Time	Cost
		\$
		\$
		\$

- ➔ *Is the work area large enough for the activity, but not so large as to result in unnecessary steps and time consuming wasted motion?*
- ➔ *How is the design of each work area customized to reflect the activity, and all of the tools, materials, and supplies, required to complete the activity?*
- ➔ *How do we know each work area is ready for an activity?*

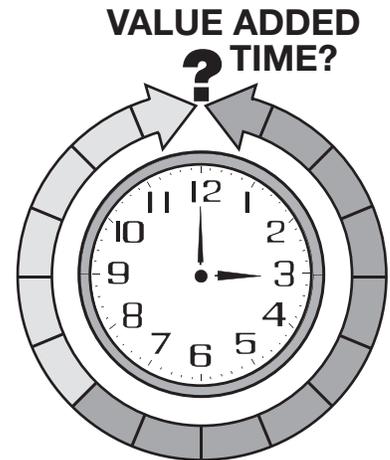
➔ *How are all of the tools, materials, supplies, parts, components, and information organized, positioned managed and replenished after each activity cycle?*

What is important here is integration of the activity with the environment. For example, if the procedure was to teach someone to swim, it would make no sense to do this in the middle of a desert. The procedure is fine, the team members are ready to go, but the workplace is totally unsuited to the activity about to be performed.

This means that standard operating procedures are a critical first step in process improvement, but the execution of each procedure requires a work area, tools and resources, which reflect the content of the activity.

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

The core of our operational stagnation is a failure to integrate time and time management as one of the important measures of activity efficiency. For example in the Time & Motion discipline of Industrial Engineering, the *base unit is a tenth of a minute or six (6) seconds*. Taking one step, reaching your hand out for a tool, turning your head to examine a blueprint detail, or raising your hand and arm to scratch your head, because you are unable to locate a tool, are perfect examples of 6 second actions.

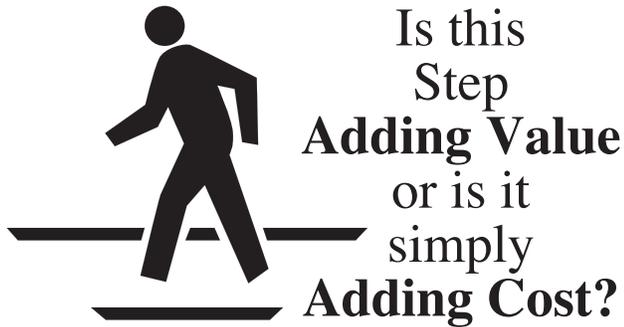


In the same way, we categorize actions as **Value Added** and **Non Value Added**. Reaching for a tool stored in a specific location is a value added activity, however, looking for a tool, which is missing, is obviously a non value added activity. Walking to the tool storage rack to pick-up a tool is a value added activity, but finding the tool is not where it is supposed to be, instantly turns the action into a non value added activity.

Our goal is to standardize and streamline each work area, to eliminate non-value-added time, to minimize

unnecessary actions, and to use every cycle to improve the organization of work areas, tools and supplies, so we continuously lower the time it takes to accomplish each step in the procedure. The key question is:

→ *How much of the Total Time expended in executing each procedure, each activity, and each production job, is Value Added Time, or is None Value Added Time?*



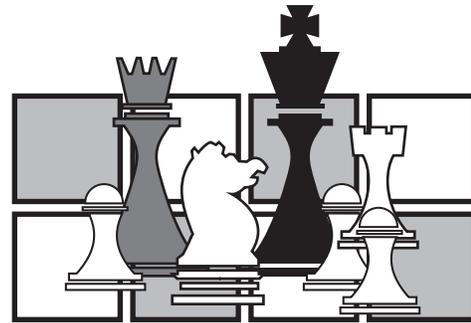
The DieInfo Standard Operating Procedure form illustrated to the previous page, shows a key section of the format, focusing on the important *Activity Time*, the measurement of each individual step, and the *Elapsed Time*, the cumulative amount of time which has passed since the beginning of the procedure. As Eugene Delacrois pointed out; *“We work not only to produce but to give value to time.”*

The problem which underlies our missing focus on standardization, simplification and streamlining, is our failure to regard every element of the work area and the way it is laid out as having a significant impact on the ability of the work teams to be safe, to be effective and to be efficient.

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

The cause of our perennial performance problem in changeover, is because we are not addressing the big picture, but we concentrate on individual pieces of the puzzle, but not all of the puzzle pieces. For example, we would all recognize that the precise and consistent execution of each procedure as important, but paradoxically

overlook the precise and consistent pre-positioning of tools, materials, and components. This is like putting a puzzle together without a picture and with pieces from several different puzzles!

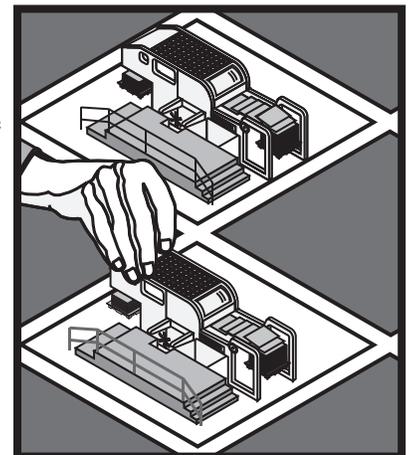


The changeover process is like playing chess. In chess all of the pieces have designated positions and clearly designed functions. Each piece has a specific role to play, and while the sequence of moves changes from game to game, the basic discipline of the game is maintained. There are no unimportant pieces, and in any game, even the most insignificant piece can play a critical role.



The comparison with changeover with chess, is imagine playing chess, if for every game there was a different layout of squares on the board, and the positions and the roles of each piece were different. This would convert chess from a game of strategy and skill to a game of chance and pure luck. Each player would have no way of planning or of developing knowledge and skill, which would enable the player to learn from mistakes, and get better from game to game.

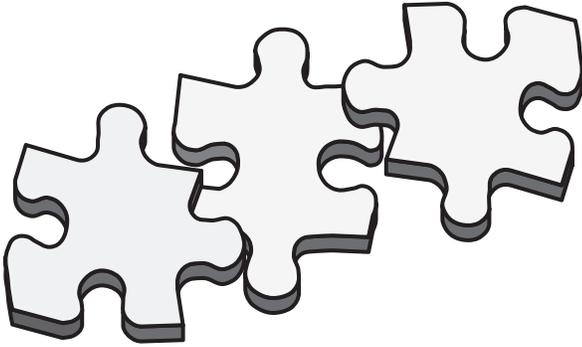
Because we allow so many uncontrolled rogue pieces in our changeover game of chess, it is chaotic, unmanageable, and totally unpredictable. Just like the game of chess we have to establish a coherent pattern to the process, we have to recognize and appreciate the role and the potential impact of every piece, and we have to follow a plan of attack, so we can confidently adjust



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our strategy for the next game.

In changeover, it is vital to control the entire playing board, to understand all of the components which play a role, and to develop a consistently applied approach, which can be adjusted and tuned from changeover to changeover. It is vital to standardize, to simplify and to



streamline the process, however, we have to start by stabilizing the current approach to changeover organization.

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

The solution to the problem of standardization, of simplification, or streamlining, and of organizing an effective system of diecutting-converting is to enact 6 important principles. Therefore, to build a foundation for changeover success it is vital that ...

- ➔ ***Every thing required for completing an effective diecutting-converting production cycle, must be standardized, without exception.***
- ➔ ***Every work area must be designated, defined, mapped, and organized, using value-added and non value added time as the organizing principle.***
- ➔ ***Everything used in diecutting-converting must have an identification code, a designated storage location, and an inventory management discipline if it is a consumable item.***
- ➔ ***Every tool, material, supply, part, component, equipment and technical data must be identified, approved and certified.***
- ➔ ***Every production cycle must begin with pre-pro-***

duction verification using a preparatory checklist to ensure readiness, and every production cycle, must include a close-out, work area purge and replenishing discipline.

- ➔ ***Every activity performed in diecutting-converting must be defined, standardized, sequenced, measured and benchmarked.***

As you read and review these key principles you can see we are laying the groundwork for the introduction of Time Management, of Just-in-Time Principles, of Single Minute Exchange of Die, and inventory management disciplines.

In practice, if you enacted and implemented the six disciplines described, the majority of performance problems you currently face would be eliminated.

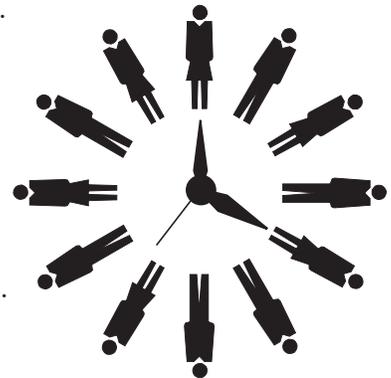
INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

Seeking to standardize, to streamline and to simplify may be a poorly executed concept in converting, but it is something the majority of people experience every day, when they walk into their kitchen.

After a while, you can almost do this blindfolded, and generally still find things.

When you walk into the kitchen, it is a relatively small area, designed to save space and time. The refrigerator, the stove, the sink, the dishwasher, and the microwave are usually in fixed positions.

If you were looking for a bowl of cereal, without much movement you could get a bowl, reach for the cereal, take one or two steps to the fridge and get the milk, reach into the cutlery draw, usually beside the sink, retrieve a spoon, grab a paper towel, and off you go.



Why does this work? First, familiarity with the space, the kitchen work area, and years of practice and well ingrained habit. But everything is where it is supposed to be. The cutlery is divided into different compartments

in the draw, usually in a shape and size, which makes retrieval and return relatively easy. The dishes are stacked in a logical manner, with bowls, plates and cups together. The cereal is in a easily accessible cupboard, grouped with other cereals. The milk is always in the fridge, and usually stored toward the front or in the door as it is accessed so frequently. The paper towels are on a roll,



usually fixed under a shelf, and maybe there is a small table and chairs in the center of the kitchen for casual meals.

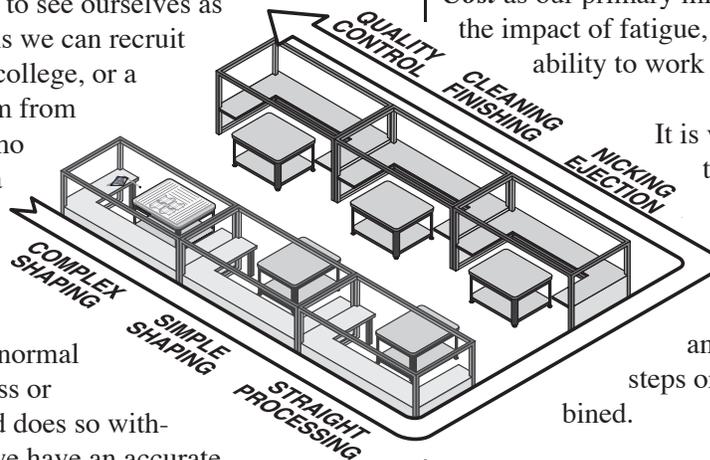
If you walked into the Converting Kitchen, the appliances would be in different locations every time, the cereal would be stored in another department, the dishes would be dirty and need washing, the cutlery would be stored all mixed together in toolboxes scattered around the department, we would have run out of milk, and we would have tripped over tools, materials, and components not replaced after their last use!

OK, maybe you are better than this, but based upon auditing hundreds of companies, my experience is, most are worse. So how could we innovate in this situation? The answer is we need to see ourselves as others see us. To do this we can recruit a student from a local college, or a member of a work team from another department, who is familiar with using a digital Camcorder.

The selected individual, completes a number of videos of a normal changeover, or pre-press or diemaking activity, and does so without prior warning, so we have an accurate series of snapshots of the real world.

Then the team reviews the video and with an open mind, looks for ways to standardize, to streamline, to simplify, and to eliminate non-value added time activity.

This process should be repeated every three months to assess our progress.



The Goals of Standardizing, Simplifying & Streamlining?

“Make everything as simple as possible, but not simpler.”
- Albert Einstein



If you were attempting to learn a new process, which, would be easier, a procedure with 15 steps, one with 10 steps, or one with 5 steps? Clearly, the one with 5 steps.

If you could choose between a work area in which, every material was stored in a single source, color coded location, every tool was positioned next to where it would be used, in a shadow box format, or tools were duplicated in each location, or you could work in an ill-defined area in which tools, materials and components were randomly positioned, which would you choose?

If you could choose between carrying materials 100 paces to complete a project or carrying materials 50 paces, which would you choose?

In an earlier section we defined *Safety-Speed-Quality-Cost* as our primary mission statement. We discussed the impact of fatigue, and stress, and frustration, on our ability to work safely and comfortably.

It is vital to standardize everything, to ensure we are working in the safest, the most efficient and the most effective manner. It is vital to streamline our activity to so well organized our work areas and our activity, that unnecessary steps or actions are eliminated or combined.

It is vital to simplify the process, by positioning things where they are needed, by having color coded storage locations for everything we use, and by following a consistently executed sequence of procedures.

Our goal is certainly to improve productivity and quality, speed and yield, but by standardizing, by streamlining, and by simplifying, we are reducing fatigue, we are low-

The ABC's of Fast Diecutting Press Changeover!

ering stress, we are making the workplace safer, and we are creating *system* of diecutting-converting, which will be simpler, faster, and better.

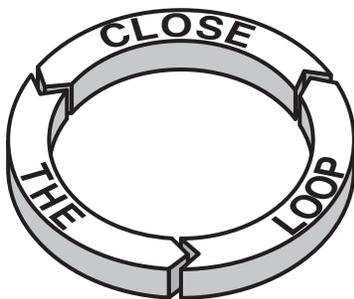
Standardize, Simplify & Streamline: Methods & Practices

"Life is not complex. We are complex. Life is simple, and the simple thing is the right thing." ~Oscar Wilde

It is possible to gather the team together, particularly if we have the video we described earlier, to seek methods of standardization, simplification, and streamlining, however, it is far more effective to gather ideas in the heat of battle, and when the issues you have just struggled with are still fresh in your mind.

We have stated a number of times that a simple close-out should be conducted, at the end of every shift, and at the end of every job. The three most important questions we defined were:

- *What worked well?*
- *What worked badly?*
- *What is the one thing we can change to improve?*



Naturally, it would be better, and it generally happens anyway, that we collect more than one idea. However, if we had one suggestion from every job we processed over the last year, we would be in a very strong position. The best thing to do is to keep it simple, and to add a degree of variety. For example, we can alternate questions:

- *What worked well?*
- *What worked badly?*
- *What is the one thing we can do to standardize and stabilize the work area?*

And the next time we could pose the final question as:

- *What is the one thing we can do to simplify and*

reorganize changeover?

And perhaps:

- *What is the one thing we can do to streamline and fine tune procedures?*

The most effective method of doing this is to select one person per shift to conduct close outs for one week, and then rotate the person, and give someone else the opportunity. It is also very sensible to use a digital tape recorder and capture every ones suggestions and recommendations, and to purge the tape at the end of each day or at the end of each week, and store the tapes on a central computer for review at process improvement meetings.

This is a good time to discuss another famous phrase from manufacturing. *"We do not have time to do it right, but somehow we always find time to do it over!"*

There is little point in adding this type of close-out to the system of manufacturing, if we are not prepared to act swiftly and decisively. If the work team do not see



something happening very quickly, we will lose credibility, and the active participation of the team members. It is relevant to end with another well known manufacturing statement. *"If you start something, you better be prepared to finish it!"*

Standardize, Simplify & Streamline: The Benefits of Change

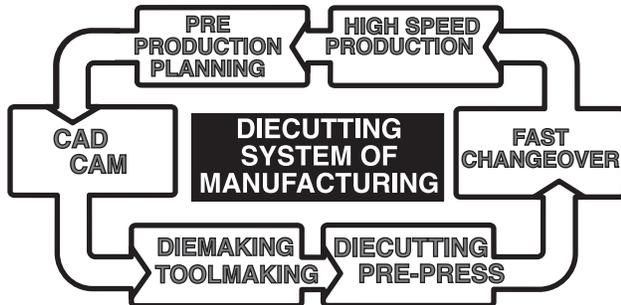
"Making the simple complicated is commonplace; making the complicated simple, awesomely simple, that's creativity." ~Charles Mingus

The first section of the manual started with Safety, and called it, the most important priority of all. If we standardize the work areas we minimize the potential for an unexpected incident; if we simplify the process and reduce the number of steps required to complete an activity, we reduce the potential for an accident; and if we stream-

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line the process and reduce the complexity of diecutting, we significantly reduce stress and fatigue.

Everything in manufacturing is a race against the clock, and it is vital to make every step, every move, and every action count. We discussed the measurement of time in manufacturing as tenths of a minute, or six seconds. This may seem an inconsequential amount of time, however, when you evaluate manufacturing and determine how much of the time is wasted in non-value added activity, you will be shocked at the incredible hemorrhaging of our most volatile resource, time!



The most important features of standardization, of simplification, and of streamlining, is you make the process faster to learn, simpler to execute, and easier to manage. The secondary benefits are lower cost, faster throughput, and greater speed to market.

And finally as we begun this module of the section with a quote from Albert Einstein, we should give him the last word; *“The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when he contemplates the mysteries of eternity, of life, of the marvelous structure of reality. It is enough if one tries merely to comprehend a little of this mystery every day. Never lose a holy curiosity.”*

Standardize, Simplify & Streamline:

Recommended Actions

“It is the essence of genius to make use of the simplest ideas.” ~Charles Peguy

The obvious starting point are the 6 principles we defined earlier:

→ *Everything required for completing an effective diecutting-converting production cycle, must be standardized, without exception.*

→ *Every work area must be designated, defined,*

mapped, and organized, using value-added and non value added time as the organizing principle.

→ *Everything used in diecutting-converting must have an identification code, a designated storage location, and an inventory management discipline if it is a consumable item.*

→ *Every tool, material, supply, part, component, equipment and technical data must be identified, approved and certified.*

→ *Every production cycle must begin with pre-production verification using a preparatory checklist to ensure readiness, and every production cycle, must include a close-out, work area purge and replenishing discipline.*

→ *Every activity performed in diecutting-converting must be defined, standardized, sequenced, measured and benchmarked.*

As with all of the initiatives contained in this project it is sensible to avoid changing everything, but to select one area and one activity to standardize and streamline.

Therefore, the *first step* should be to define each separate or integrated work area, and list the activities, which are performed in these areas. The *second step* is to select the

FLOWCHART SYMBOL KEY			
Number	Symbol	Name	Represents
1	▭	Start & End	Procedure or Process
2	▭	Operation	Process Activities
3	◇	Decision	Choice between Alternative Options
4	○	Inspection	Evaluation of Output Quality
5	⌋	Paper	Generation of Information on Paper
6	➡	Movement	Transport of Information, Materials, Work-In-Process
7	⏸	Delay	Interruption or Hold on Activities
8	▽	Storage	Temporary Storage of Information, Materials, Work-In-Process

work area or work cell, which is going to be our test bed. The *third step*, after choosing the area to be processed, is to list and give an identity code to every tool, material, supply, part, component, and piece of equipment, which is in the area, or which is moved into the area during the activity we are focused upon.

The ABC's of Fast Diecutting Press Changeover!

The *fourth step* is to map the area at a specific scale, choosing a ratio which is easy to work with, 1/4" to the foot for example, and then create the layout in the CAD system. The *fifth step* is to layout all of the permanent equipment in the area and produce scale drawings of the temporary equipment used in the area.

How does your organization:

- | |
|------------------------------------|
| 1 Solve problems? |
| 2 Identify cause? |
| 3 Share solutions? |
| 4 Improve practices? |
| 5 Upgrade procedures? |
| 6 Communicate change? |
| 7 Teach new skills? |
| 8 Build performance parity? |

The *sixth step* is to map how every item reaches the work area, where it is positioned in the department or the company, how it gets to the work area, how it is positioned in the work area, how it is used in the work area, and how it is returned to its original storage location.

The videotape, when combined with these activities, will inevitably demonstrate either an unusual, precise and wonderful system of organization, or the more normal inconsistent, chaotic and inefficient, and extremely varied approach to task completion. It may be useful to teach the work teams basic flowcharting as an excellent tool for this and for later processes.

Clearly, this initiative is clearing the ground for the more intense Just-In-Time organization, the critically important SMED discipline, and the essential Inventory Management controls.

Section Six:

Standardize, Simplify and Streamline: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ It is obviously important to standardize current procedures, but only as a preliminary benchmark for process simplification and the continuous paring away of superfluous steps, non value-added time, and excess cost.
- ➔ ***What is the point of creating standard operating procedures, when the organization in which they are performed, is not in itself standardized?***
- ➔ ***What is the point of creating standard operating procedures, when many of the steps, are repetitive duplication of unnecessary actions?***
- ➔ ***What is the point of creating standard operating procedures, when the work areas are constantly changing, and are different every time?***
- ✓ There should be no doubt that the end result of an effective training and re-training program must be a process that is quicker, better and less expensive. However, the effort has to be directed at procedural simplification rather than just looking for generic poorly organized ways to “improve.”
- ✓ Defining how to execute a standard operating procedure is excellent, however, the effectiveness and the efficiency of task completion requires a detailed analysis and preparation of everything involved in the work activity. Key questions which should be asked, include:
 - ➔ *Is the procedure being performed in a specialized work area, customized for the activity?*
 - ➔ *Does the work area only contain all of the tools and materials necessary for successful completion of the procedure?*
 - ➔ *How is the integration of the procedure and the work area, and all of the tools, materials, and components managed for consistency?*
 - ➔ *Is the work area large enough for the activity, but*

not so large as to result in unnecessary steps and time consuming wasted motion?

- ➔ *How is the design of each work area customized to reflect the activity, and all of the tools, materials, and supplies required to complete the activity?*
- ➔ *How do we know each work area is ready for an activity?*
- ➔ *How are all of the tools, materials, supplies, parts, components, and information organized, positioned, managed and replenished after each activity cycle?*
- ✓ The solution to the problem of standardization, of simplification, or streamlining, and of organizing an effective system of diecutting-converting, is to enact 6 important principles. Therefore, to build a foundation for changeover success it is vital that ...
 - ➔ ***Everything required for completing an effective diecutting-converting production cycle, must be standardized, without exception.***
 - ➔ ***Every work area must be designated, defined, mapped, and organized, using value-added and non value added time as the organizing principle.***
 - ➔ ***Everything used in diecutting-converting must have an identification code, a designated storage location, and an inventory management discipline if it is a consumable item.***
 - ➔ ***Every tool, material, supply, part, component, equipment and technical data must be identified, approved and certified.***
 - ➔ ***Every production cycle must begin with pre-production verification using a preparatory checklist to ensure readiness, and every production cycle, must include a close-out, work area purge and replenishing discipline.***
 - ➔ ***Every activity performed in diecutting-converting must be defined, standardized, sequenced, measured and benchmarked.***

Section Six:

Standardize, Simplify and Streamline: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Why is the creation of standard operating procedures only the first step in improving the diecutting process?
- ✓ What did Ann Knight say were the three most important things, right now?
- ✓ What do you see as the foundation for a great performance in sport?
- ✓ Define three issues, which must be resolved to improve the performance of a procedure in a specific activity?
- ✓ What is the base measurement of time in the process improvement discipline?
- ✓ What does Value-Added Activity and Non Value-Added activity mean?
- ✓ What are the two key measurements of time defined in a standard operating procedure?
- ✓ What is the justification in comparing diecutting press changeover to a game of chess?
- ✓ Name three of the important principles of standardization, simplification, and streamlining?
- ✓ How do you relate the comparison of work area organization to the organization of an effective kitchen in relation to the organization of diecutting press changeover?
- ✓ What feature of the organization of an effective kitchen do you feel would fit into diecutting changeover?
- ✓ Why do you think it is necessary and an advantage to videotape key activity in diecutting, pre-press and diemaking?
- ✓ What do you see as the benefits of color coded, single source locations for key tools, parts and components?
- ✓ How do you see standardization and simplification improving the safety of the workplace?
- ✓ What are the three questions, which should be asked as part of a job close-out?
- ✓ What do you understand is “mapping” the work areas, and for what purpose?
- ✓ What is Flow Charting?

Manufacturing System of Organization

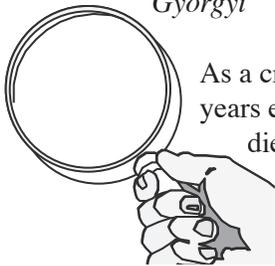
Section 07: Research & Development

Key Definitions: ... a methodical investigation into a subject in order to discover facts ... to establish or revise a theory, or to develop a plan of action based on the facts discovered ... experimentation aimed at the discovery and interpretation of facts ... revision of accepted theories in the light of new facts ... the practical application of such new or revised theories or facts ...

The Research Mission Statement: "It is the mission to treat each production cycle as a controlled experiment, with the goal of conducting a methodical, detailed, and thorough investigation of one or more aspects of the production cycle, to discover and to develop a more detailed and precise understanding of the process, and to continually upgrade key practices."

Title: Research & Development

"Research is to see what everybody else has seen, and to think what nobody else has thought." ~Albert Szent-Gyorgyi

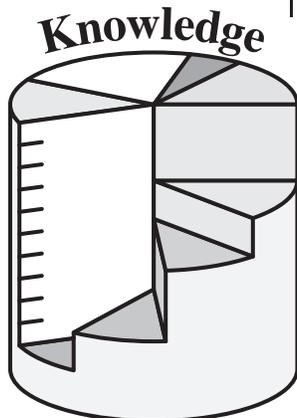


As a craftsman of more than 40 years experience, in every form of diecutting, I have amassed a respectable foundation of knowledge, skill and experience. However, this technical information resource is

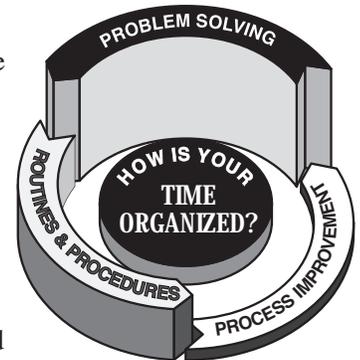
always being successfully challenged by new problems, by new materials, by new diecut designs and by new technology. My life in diemaking and in diecutting is consumed with understanding and solving problems and in struggling to overcome technical obstacles and striving to find more effective ways to do things.

I have no room or time for complacency because I am constantly reminded of what I do not know. Every time I learn something new, or find a better way to do things, or make a mistake, the expansion of the boundaries of my knowledge expose unknown territory, new possibilities, and my lack of comprehension. What has helped me in my career is an early revelation by a Master Craftsman, that diecutting-manufacturing is primarily a research activity. He always liked to say; "*Experience is a hard teacher because she gives the test first, the lesson afterwards.*"

The reality of this statement is reinforced every day in converting. We are not executing the fastest press changeover, we are not running at maximum speed, we do not sell the first impression,



we struggle with fast press make-ready, we experience variation in diecut part quality and consistency, and if we are honest, we struggle with mistakes, errors, and failure. It is useful to remember, from an earlier section that the structure of work consisted of three activities:



- 1: Routines & Procedures
- 2: Innovation & Improvement
- 3: Trouble Shooting and Problem Solving

As we spend and invest a significant portion of our time in trouble shooting, overcoming technical challenges and solving problems, it should be obvious we have a tremendous personal and organizational benefit in finding solutions. And in avoiding problems before they become problems.

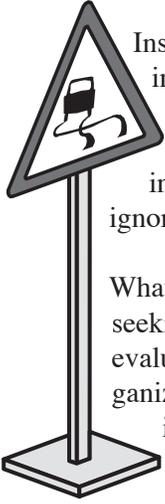
The most important reality to accept is that **Manufacturing is Research!** Every production cycle generates new technical data, it reveals new problems and challenges, it expands the boundaries of our knowledge, it exposes the limits of our experience, and it finds different ways to add stress and frustration to our lives! Josh Billings has a great quotation which can be applied here. He stated that; "*True wisdom is plenty of experience, observation and reflection. False wisdom is plenty of ignorance, arrogance and impudence.*"

There is absolutely nothing wrong in not knowing something, what is wrong is an unwillingness to accept our lack of knowledge, and a lack of determination to attack this problem in every production cycle.

Research & Development:

Problems & Solutions

“If we knew what it was we were doing, it would not be called research, would it?” ~Albert Einstein



Instinctively, we understand that manufacturing is research, as Albert Einstein wryly observes above, but we do not give it the importance it deserves. We are investing in research and development, and simply ignoring the results.

What is Research in Diecutting? Research is seeking new knowledge; it is assessing and evaluating new information or facts; it is reorganizing our understanding of the process, it is adjusting our skills, actions, and procedures; it is documenting and communicating results; and, as we implement the new practices, we seek new knowledge.

What is Development in Diecutting? Development is the recognition and the acceptance of our incomplete knowledge; the creation of a testing situation or a focus on a particular feature of each production job to push the boundaries of our understanding; the collection of results and the brainstorming and discussion of the implications; the assimilation of approved changes into more effective methods, practices and procedures; and the recognition of our incomplete knowledge ... As Aldous Huxley pointed out; *“Experience is not what happens to you; it is what you do with what happens to you.”*

RESEARCH & DEVELOPMENT

Every day, in every design, in every problem, through every job cycle, there is new data and new knowledge generated, which can be collected and applied, to make every subsequent task simpler, more efficient, and less costly.

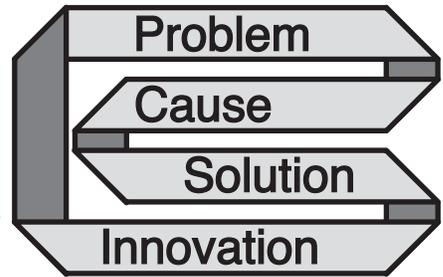
This cycle of research is happening under our noses, whether we recognize it or not. The cycle of development is revealing solution after solution, even as we ignore the innovation. The irony of this situation, is we invest heavily in Research and Development through every production cycle, but we do not have the discipline or the organization to take advantage of the opportunity. As James Reed pointed out; *“There is a remarkable agreement upon the definition of learning as being reflected in a change of behavior as the result of experience.”*

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

There are two primary problems with the way we currently do things in diecutting:

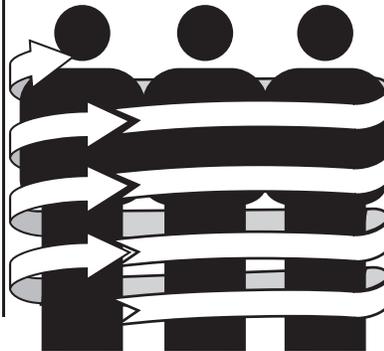
- 1: *We are not actively, aggressively and scientifically seeking solutions and more effective ways to do things.*
- 2: *We have no effective system designed to collect, collate, approve and share new knowledge and solutions to perennial problems.*

This is particularly egregious because at the very least, we should be cooperating with our colleagues and pooling our experience. Even if you feel you have to see it first hand, as Alfred (Lord) Tennyson scripted...



*“And others’ follies teach us not,
Nor much their wisdom teaches,
And most, of sterling worth, is what
Our own experience preaches.”*

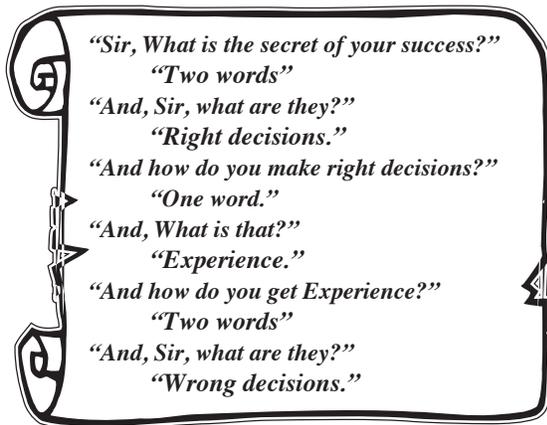
It is critically important that we implement an organized, directed, and a more consensus driven approach to process research and development. This is particularly important, as why invest in research if someone in the work teams has the solution, or at least an idea of how to solve a specific problem. The first thing on the agenda should be to test out all of those theories which abound in any manufacturing operation.



The problem is we do not see manufacturing as shared research, and as a result, we have no system of collecting, prioritizing and focusing each production cycle upon a specific problem or upon a specific issue.

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

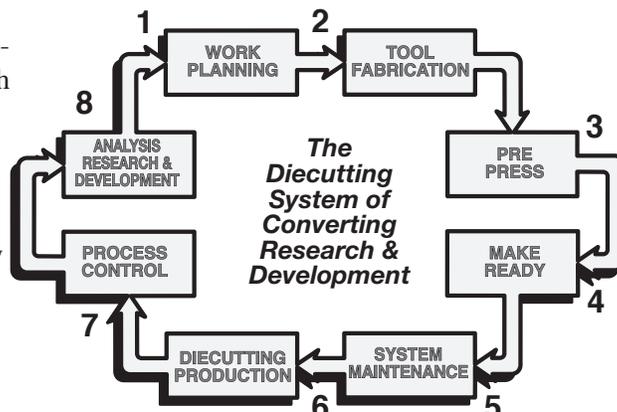
Each production cycle is just that, a closed loop of activity, with a beginning and an end. Even though we have no formal research and development discipline, the repetitive, cyclical nature of our process, drives new knowledge into even the most reluctant of students. But as this is obvious to everyone, what is the cause of our inability to take advantage of the daily lessons the process administers?



The most likely cause is the lack of organization and discipline in the execution of tasks. In a system of manufacturing, where procedures, practices, and methods are different from individual to individual and from job to job, it is difficult to isolate one factor in the process. Even if that were possible the lack of consistency in the process would render any conclusion suspect and unreliable.

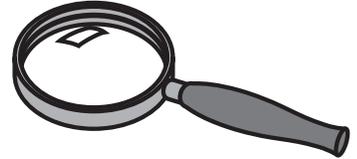
One of the problems inherent to diecutting organization, is a failure to practice work planning and/or to conduct a close-out! Because we are always behind the clock, we race from disaster to disaster, with little time to consider the logic of our actions, or the results of our work. Without a standardized approach and without the teamwork, essential to an effective research discipline, we are forced to repeat the same poorly executed process, even though it is complex, it is difficult, and it rarely meets the quality standards or the productive output required.

Remember the mission state-



ment, Safety-Speed-Quality-Cost? Realistically, the most effective way to achieve this and to sustain the improvement we are driven toward and we strive for, is primarily to make diecutting as simple as possible. And simplicity is gained through experience and by applying the understanding that comes with it.

However, it is necessary to organize the generation of experience, and to zero in on one or two key factors in every production cycle.



SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

The solution is obviously to start putting a research and development program together. However, in the beginning the guiding principle is KISS, Keep it Simple ... well you know the rest. We should, of course, conduct an analysis of the process and define and prioritize all known problems, in terms of the degree of their negative impact on quality, productivity, and performance. However, as this project contains many other integrated changes to the system of manufacturing, a cautious start is recommended.

What should we be looking at? My recommendation is to initially focus upon the following disciplines:

➔ **Tool Design and Tool Specification**

(This is important because it defines the interaction between the male and female tool, particularly the steel rule die and female counter or Matrix, as these tools set all of the converting parameters, which form the product and which enable it to meet the product packaging requirements.)

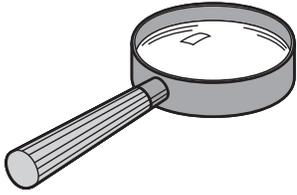
➔ **Tool Manufacturing and Tool Fabrication**

(This is important because we need to make sure the tools are correct to the standard specification, they are correct to the diecut product application, they have the correct converting parameters, and the tools are manufactured consistently and meet diecutting performance standards.)

The ABC's of Fast Diecutting Press Changeover!

→ The Press-The Toolholder

(This is critical because we need to ensure the press is calibrated, it is maintained correctly, it is clean and in sound operation. We also need to collect and format settings, and record key information, such as pressure settings, and the pressure calculation.)



→ The Diecut Material

(This is vital as we will be using several different materials, of different calipers and different grades from different Mills, with different manufacturing specifications. Therefore, our testing may examine one detail of the conversion of the material for each job cycle. These could include but not be limited to the pressure to diecut, the degree of flaking, the most effective channel parameters and crease pointage, the best knife, and the optimal nick size(s).)

→ The Converting Process

(Converting consists of six disciplines which are used to transform a sheet or web of material into a finished product or a component of higher value than the original material. These six converting disciplines we need to assess the performance of are:

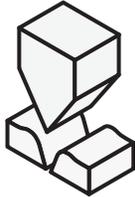
- 1: Cutting
- 2: Creasing
- 3: Scoring
- 4: Perforating
- 5: Debossing
- 6: Embossing

→ The Diecutting Process: Toolmaking

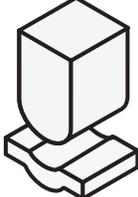
(This is important as we need to focus on each of the individual tools, or the individual features of all of the tools used in diecutting, as their synchronization, alignment, and interaction are critical to success. The tools and the features we need to isolate include:

- Cutting & Creasing
- Ejection & Nicking
- Stripping & Waste Separation
- Blanking, Stacking, & Frame Extraction

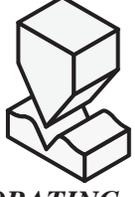
CUTTING



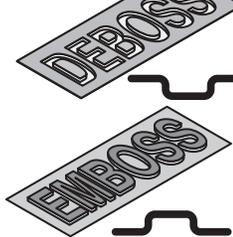
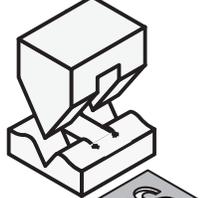
CREASING



SCORING



PERFORATING



• Tool Synchronization & Registration

→ The Diecut Product

(This is important because it is vital we understand the functionality and assembly sequence of the structural design, the integration with print and graphics, the product application, and how to most effectively assess and qualify the product to ensure it meets customer requirements.)

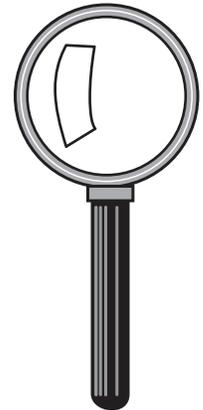
→ The Diecutting Process: Set-Up and Converting

(This is important because it defines how we plan and organize, how we prepare and assemble the tools and materials, how we put everything together on press during make-ready, how we manage and control production, and how we manage quality and close-out the process.)

→ Diecutting System Maintenance

(This is important because it defines how we deal with six critical disciplines in maintaining the press in optional operating condition. System Maintenance is addressed in more detail later in the manual, however, the six disciplines are:

- 1: Safety Management
- 2: Preventative Maintenance
- 3: Maintenance
- 4: Cleaning & Housekeeping
- 5: Just-In-Time Organization
- 6: Inventory Management



We could certainly add many more research and development projects to this list, however, this represents a logical starting point, and I suspect this activity will consume research and development for several years!

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

The difficulty we face in the current situation is we do not know what we know, which makes it difficult to identify what we do not know! The point here is, rather than launch into a research and development program, we need to find out what everyone already knows, we need to define our primary problems, and we need to see if anyone in the work teams has a solution or a great idea that may lead to a solution. Why reinvent the wheel?

To accomplish this starting point to the project is relatively easy and requires implementing the following steps:

→ **Announce & Describe the Project**

(Circulate the list of potential research subjects outlined in the solution section, and ask everyone to specify their top 10 technical issues, problems, or challenges.)



→ **Set-Up a Team Meeting**

(Review the research list and amalgamate all of the technical problems into a single prioritized list.)

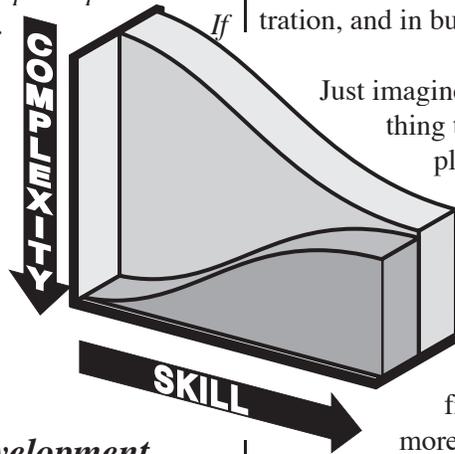
→ **Communicate & Request Feedback**

(Type up the prioritized list of problems, and circulate, asking for suggested solutions to be discussed at the next team meeting.)

→ **Consolidate Problems & Solutions**

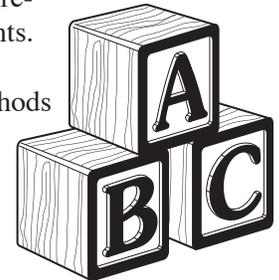
(At the next team meeting compare the problems with any suggested solutions. Set-up a testing program for the solution, based upon a priority selected by a consensus. no solutions are presented or accepted, set-up a research program based upon the prioritized problem list.)

This is the most effective manner in which to organize this project, as it gets the entire team involved, and it reinforces the importance of standardization and cooperative working.



to do things. By eliminating variables and unknown elements from the process, we significantly lower non value added time, we make rapid progress toward one-touch set-up, and we eliminate the variables that constantly undermine our current effort.

Simpler is easier to remember, it is faster to teach and train, and it is simpler to learn and to master. Simpler is rapid execution, with less steps to reduced mistakes, errors and accidents.



Simpler lowers complexity in methods and practices, in actions and procedures, and in communication and management. Simpler is key to performance parity and to procedural uniformity. Simpler is the driving force of greater consistency, of lower cost, and of exceptional speed to market. Simpler means eliminating the unknown and unplanned, minimizing stress and frustration, and in building self confidence and self esteem.

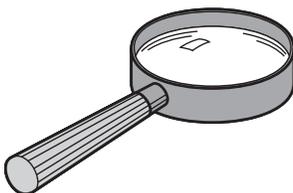
Just imagine if we always knew what was the right thing to do, at the right place, at the right place. And if you did not know, comprehensive, well organized reference tools are immediately accessible, to remind you of the correct action.

This is World Class organization at its best. The more mystery we remove from the process the better we get, the more mystery we allow into the process the more difficult it is. Research and Development may seem to be a discipline you can pick or choose to adopt, but in reality it is the essence of effective manufacturing.

The Goals of Research & Development

“I am enough of an artist to draw freely upon my imagination. Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world.”
~Albert Einstein

The goals of research and development are to develop a better understanding of the entire process, to convert this knowledge into more efficient and more effective skills, and to use the increasing experience of the team to make better products faster, and at a lower cost than our competitors.



Raising knowledge and skill level across the diecutting team has obvious benefits to everyone involved, but the greatest advantage is an effective research program

will lead to increasing simpler and more effective ways

Research & Development: Methods & Practices

“It’s not what you don’t know that gets you in trouble, but it’s what you do know that isn’t so.” ~Mark Twain

Research and Development is an important project which clearly has to be integrated with a number of other team initiatives, already specified in the manual, and frankly, with more team projects to be initiated, as this Fast Press Changeover project is defined in total. One of the methods of dealing with so many projects is to arrange project execution periodically, based upon a calendar schedule. For example, while it is beneficial to integrate research and development into every production cycle, at the

The ABC's of Fast Diecutting Press Changeover!

beginning of the project particularly this may be unmanageable, depending upon the staffing and resources at your disposal.

The solution is to choose one day of the week, usually Monday, which is often the quietest day in many converting operations, as the Research & Development Day. On that day the team meets, they follow-up existing research projects, organize new projects, and schedule them for execution every Monday. Naturally, if the work load permits, these production experiments can bleed over into other days, however, in the beginning, this is probably the most pragmatic method of getting the project underway.

We have existed successfully for many years without a structured research and development program, and however attractive the project and the benefits, it is wise to start slowly. In part, this is because the organization of any experiment requires careful discussion, precise planning, and accurate implementation.

Many of the research and development program will inevitably cross lines of demarcation between the internal and possibly the external customer-supplier chain. Therefore, the team should be composed of team members who are a mixture of permanent members, and temporary members, working upon a specific project, which impacts their specific process.

The permanent team must include the department supervisor or a facilitator if one is involved, the CAD technician or structural designer, a toolmaker, a pre-press technician, a diecutter, and an outsider. In most cases the most appropriate "outsider" should be from the Supplier Printing department or the Gluing Customer Department. Their participation is to inject a more objective view of the program, and to reference or to ask questions, which directly impacts their department.



This represents a modest start. But it is a start! The act of getting all of the problems listed, and the making the effort to gather all of the potential solutions, from all of the diecutting department team members, usually generates more solutions than the team will be able to handle.

Get a Research and Development initiative going, and keep it going!

Research & Development:

The Benefits of Change

"Knowledge always desires increase; it is like fire, which must first be kindled by some external agent, but which will afterward propagate it." ~ Johnson

In a global economy it is dangerous to assume there is a safe haven where you are protected from aggressive off-shore, lower cost competitors. We have to accept our

QUESTIONS -- QUESTIONS --- QUESTIONS!

What is the best knife bevel angle for this material?
What is the most wear resistant edge type?
What is the diecutting pressure per inch?
What is the most effective crease pointage?
What is the best thickness for the female counter?
What is the best width of counter channel?
What is the most effective crease penetration?
What is the abrasive impact of this material on each tool?
What is the caliper variation range?
Will this material require "T" or "J" Knives?
What is the correct nick width for this material?
What is the correct ejection durometer & resiliency?
What type of edge will score with minimal adjustment?
What is the correct perforation for this paperboard?
What are the most effective parameters for embossing?
What are the most effective parameters debossing?
What is the aperture allowance for stripping this material?
What is the smallest waste piece which can be stripped?
What are the minimum double cut widths for blanking?
What blanking allowances are necessary?

market, our industry, and the world around us has changed radically and the pace of change will continue to accelerate exponentially.

This is also a painful personal message to every crafts man and woman who read this, because in reality every one of us is self employed. It is not alarmist to state, that it is not just your company's future which is in question, but everyone of our jobs, our pensions, and our livelihood.

What is the one edge we currently have? Speed to Market. Speed in manufacturing is a powerful weapon, which when harnessed effectively, is difficult to compete against. Speed lowers cost. Speed, strong teamwork and distributed knowledge in any organization are very difficult to compete against. Safety-Speed-Quality-Cost. How do we get there from here?

In the face of a common enemy it is natural to come together, to work together, and to stay together until the



threat is eliminated or is diminished. The problem is we are not working as a team, we are not sharing and pooling our knowledge and experience, and we are working as though we are competing against one another.

We have to eliminate our traditional approach to manufacturing and work together for the good of the team. We need to standardize, to stabilize and to simplify the current system of manufacturing. Part of that process is to find out and bring together what we currently know, to identify the key weaknesses of our current system of manufacturing and the things we don't know, and to instigate a rapid and aggressive program to fill in the gaps in our collective knowledge and experience.

Remember one of my often repeated and clearly favorite quotations, which is; *"To get everyone to know what everyone already knows."* A key part of this rebuilding and restructuring process is the implementation of an effective research and development program.

Research & Development:

Recommended Actions

"The essence of knowledge is, having it, to apply it; not having it, to confess your ignorance." ~Confucius

Setting up a Research and Development discipline in diecutting-converting is clearly a team project, as we are attempting to gather, to share, and to stabilize everyone's knowledge, and or lack of knowledge.

Therefore, the first step in setting up the project is to create a Research & Development Management Team. We specified the permanent team must include the department supervisor or a facilitator if one is involved, the CAD technician or structural designer, a toolmaker, a pre-press technician, a diecutter, and an outsider. In most cases the most appropriate *"outsider"* should be from the Supplier Printing department or the Gluing Customer Department. Their participation is to inject a more objective view of the program, and to reference or to ask questions which directly impacts their department.



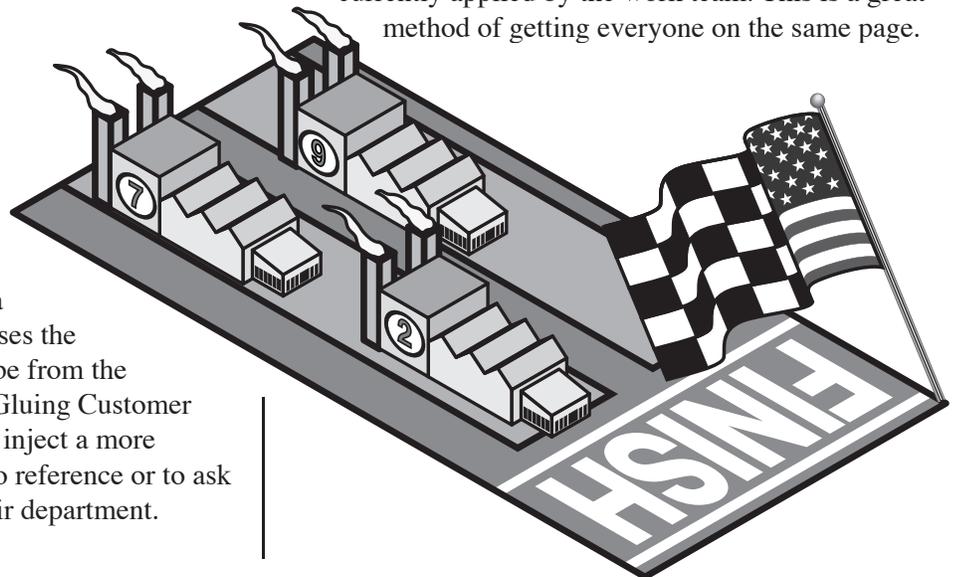
We defined the start of the project as finding out where we are now. This involved the team planning, organizing, communicating with the departments involved, and scheduling team meetings to:

- ➔ *Announce & Describe the Project*
- ➔ *Set-Up a Team Meeting*
- ➔ *Communicate & Request Feedback*
- ➔ *Consolidate Problems & Solutions*

To focus the project, and to derive maximum short term productive benefit, we recommended focusing upon the following technical disciplines of diecutting.

- ➔ *Tool Design and Tool Specification*
- ➔ *Tool Manufacturing and Tool Fabrication*
- ➔ *The Press-The Toolholder*
- ➔ *The Diecut Material*
- ➔ *The Converting Process*
- ➔ *The Diecutting Process-Toolmaking*
- ➔ *The Diecut Product*
- ➔ *The Diecutting Process: Set-Up and Converting*
- ➔ *Diecutting System Maintenance*

This is an important project, in part because it is an initiative which generates fast, short term improvement. The act of bringing everyone together always demonstrates there is more individual knowledge available than is currently applied by the work team. This is a great method of getting everyone on the same page.



Section Seven:

Research & Development: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ The reality of our technical struggle is reinforced every day in converting. We are not executing the fastest press changeover, we are not running at maximum speed, we do not sell the first impression, we struggle with fast press make-ready, we experience variation in diecut part quality and consistency, and if we are honest, we struggle with mistakes, errors, and failure.
- ✓ The most important reality to accept is that **Manufacturing is Research!** Every production cycle generates new technical data, it reveals new problems and challenges, it expands the boundaries of our knowledge, it exposes the limits of our experience, and it finds different ways to add stress and frustration to our lives! There is absolutely nothing wrong in not knowing something, what is wrong is an unwillingness to accept our lack of knowledge, and a lack of determination to attack this problem in every production cycle.
- ✓ What is Research in Diecutting? Research is seeking new knowledge; it is assessing and evaluating new information or facts; it is reorganizing our understanding of the process, it is adjusting our skills, actions, and procedures; it is documenting and communicating results; and, as we implement the new practices, we seek new knowledge.
- ✓ What is Development in Diecutting? Development is the recognition and the acceptance of our incomplete knowledge; the creation of a testing situation or a focus on a particular feature of each production job to push the boundaries of our understanding; the collection of results and the brainstorming and discussion of the implications; the assimilation of approved changes into more effective methods, practices and procedures; and the recognition of our incomplete knowledge ...
- ✓ Each production cycle is just that, a closed loop of activity, with a beginning and an end. Even though we have no formal research and development discipline, the repetitive, cyclical nature of our process, drives new knowledge into even the most reluctant of students. But as this is obvious to everyone, what is the cause of our inability to take advantage of the daily lessons the process administers?
- ✓ The solution is obviously to start putting a research and development program together. However, in the beginning the guiding principle is KISS, Keep it Simple ... well you know the rest. We should of course conduct an analysis of the process and define and prioritize all known problems, in terms of the degree of their negative impact on quality, productivity, and performance. However, as this project contains many other integrated changes to the system of manufacturing, a cautious start is recommended.
- ✓ The difficulty we face in the current situation is we do not know what we know, which makes it difficult to identify what we do not know! The point here is rather than launch into a research and development program, we need to find out what everyone already knows, we need to define our primary problems, and we need to see if anyone in the work teams has a solution or a great idea that may lead to a solution. Why reinvent the wheel?
- ✓ The goals of research and development are to develop a better understanding of the entire process, to convert this knowledge into more efficient and more effective skills, and to use the increasing experience of the team to make better products, faster and at a lower cost than our competitors.
- ✓ In a global economy it is dangerous to assume there is a safe haven where you are protected from aggressive off-shore, lower cost competitors. We have to accept our market, our industry, and the world around us has changed radically and the pace of change will continue to accelerate exponentially.

Section Seven:

Research & Development: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Why do you feel we struggle with fast press changeover, low production speed and yield, and variable performance?
- ✓ How do you currently extract new knowledge and new experience from every production cycle, and how is this information shared and cross referenced with your colleagues?
- ✓ Why do you think manufacturing is classified as research in this manual?
- ✓ How would you describe research in diecutting-converting?
- ✓ How would you describe development in diecutting-converting?
- ✓ What do you see as the inhibitions and/or restrictions on sharing knowledge and experience in a team environment?
- ✓ What specific research and development projects have you been involved in over the past 12 months?
- ✓ Name three of the technical disciplines the rec-

ommended research and development program included.

- ✓ What are the 6 disciplines of converting, and where are all these tools installed?
- ✓ What is the first action a Research & Development team should implement to get the project underway?
- ✓ What are two of the key goals of process improvement in terms of simplification and reducing the degree of complexity?
- ✓ What do you see as the benefits of simplification of the process outlined in this section?
- ✓ How did we recommend controlling the initial scope of the research and development project?
- ✓ Name three of the people who should be members of the Research & Development coordination team?
- ✓ Who is currently responsible for research and development in your operation and how does it work?
- ✓ How would you organize the research and development program, and what area of the diecutting process would you attack first?

Manufacturing System of Organization

Section 08: Document the Process

Key Definitions: ... a formal piece of writing that provides information or acts as a record of events or arrangements ... records or writing that contains information ... to furnish with documents or papers necessary to establish facts or give information ... to record the details of an event or a process ... a recording or a photograph providing decisive evidence or information or facts ...

The Documentation Mission: "It is the mission to develop an up-to-date system of documentation, which will capture, organize, store and back-up all crucial information, in an accessible manner, to deliver a detailed picture of all critical elements of the process, to provide the management team, work teams and individuals with the ability to make accurate adjustment."

Document the Process:

An Overview

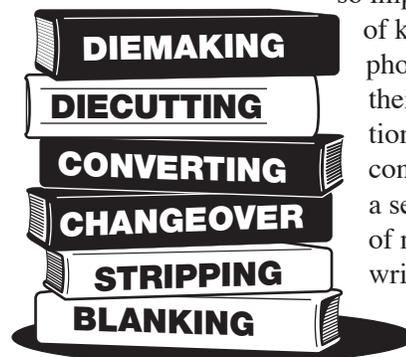
"Either write something worth reading or do something worth writing."

~Ben Franklin

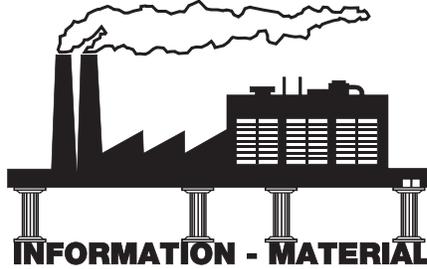
Imagine it was your first day as a trainee in a diecutting-converting operation. You have committed to immersing yourself in a world with a unique language, with a unique measurement system, with unique rituals and traditions, and unique legends and mysterious Black Arts. You are faced with a bewildering array of processes, technology, and materials in a labyrinth like layout, which seems to be a minefield or a maze designed to intimidate and to confuse you as thoroughly as possible.

However, I suppose we could make it easier?

First of all, would a map help! Would a simple graphical explanation of each process, a layout of departments and functions, and how the product emerges at each stage of the process prove to be an advantage? Would a short video of the manufacturing phases of paperboard folding carton and fluted container production help to put things in perspective? Would it be an advantage to provide a brief explanation of what is a folding carton, how they work, what are they called, and why are they so important? Would a list



of key people, with their photograph, their title, and their role in the organization help to clarify the constant introduction to a seemingly endless flow of new people? Would a written job description for the role you are being trained for, help you



to get organized, focused, and prepared to swiftly assimilate your new job?

Yes, of course, all of these things, and many other simple pieces of information, would help to eliminate days, weeks and months of confusion. You must have missed the sign; "Abandon

hope, all ye who enter here!"

Unfortunately, you have entered a profession with a strong aversion and a deeply rooted, paranoid fear of writing things down, and a disdain for committing critical information to paper. It is going to inhibit your training, it will undermine the performance of your job, it will make it extraordinarily difficult to be as good as you can be, it will cause you great stress and frustration, and it will undermine your job security and the viability of the company you have chosen to work for.

Do you feel this description is an exaggeration?

Manufacturing is about two things. The movement of information and material.

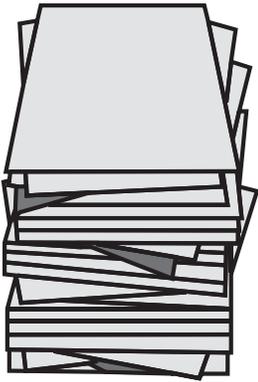


When you are faced with a new task in the diecutting process you have an array of materials to work with. Some of these materials would include plywood, steel rule, rubber, paperboard, ink, glue, film, and tape. Everything and anything else involved in the process is about information.

Do you have to make a jigged dieboard for the next order? Where does all of the information come from, enabling you to select the plywood panel, cut it to size,

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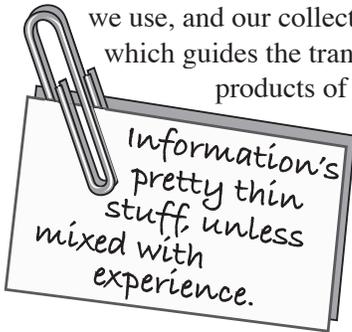
draft the layout, operate the jig saw, and saw the board? Actually, from your brain, or more accurately, from your internal information center or technical library.



When you make ready the press, everything you have to do stimulates a response in terms of applied knowledge and experience, executed skills and action, and management and control of the activity. All of which are retrieved from memory and guided by your brain as it processes information, in fact extraordinary amounts of information.

Manufacturing is about two things. The movement of information and material.

In diecutting-converting the only expertise that really matters is our knowledge of all of the materials we use, and our collected information resource, which guides the transformation of material into products of higher value.

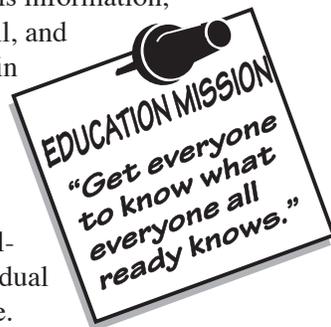


It is not that we do not have the information, but we make it incredibly difficult to initially gain access to the data, and we place barriers to ongoing

seamless access. In fact, to compound the problem, we store some of the most important information in the brains of many different people in the operation who have limited ability to communicate, to share, and to network this critical resource!

Which means in practice we do not know if we have all of the information we need!

The key point that is essential to understand, is the most valuable resource we possess is information, in the form of knowledge, skill, and experience. Our primary role in the diecutting manufacturing operation is to be a manager, supervisor, or a technician in one form or another. Our secondary role is to collect, to collate and to organize our individual and team information resource.



Document the Process:

Problems & Solutions

"We do not remember days, we remember moments."
~Cesare Pavese

In a team driven environment it should be safe to say most team members know what other team members know? In practice, teamwork is about sharing knowledge and skill so we can all do better collectively than we could as individuals, working toward the same goal.

As performance parity and procedural uniformity are the goal, it stands to reason we have to do our very best to

share and to distribute the knowledge and information we need to be successful.

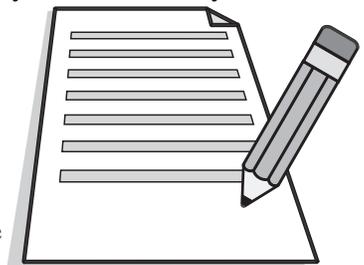
"Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information upon it."

Samuel Johnson

But realistically, there is a limit to how much informa-

tion you can or you should retain about all the different processes, job details and tool parameters, necessary to complete a production cycle. In addition, some people are more effective at retaining and retrieving information than others. As our base goal is team parity, it goes without saying, that we should be collecting and collating information, revising and purging data, and constantly improving a technical library, which is readily accessible to every team member.

Well, somehow we forget the basic principles of manufacturing, and we seem surprised when people make mistakes because of incorrect or incomplete

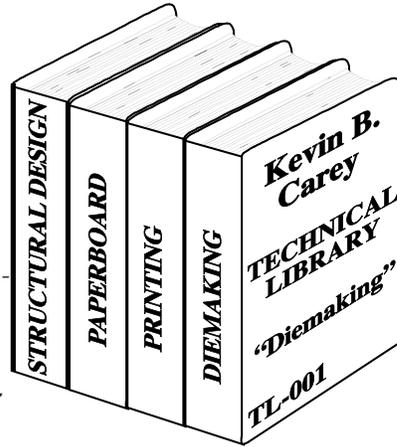


information. To be successful, we have relentlessly build our own and the teams technical information resources.

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

The failure to document the process is often related by inadequate organization, preparation, and communication with the work teams. What are the benefits of these additional work duties? How will they impact my job, my work, and my status? In anticipation of these and many

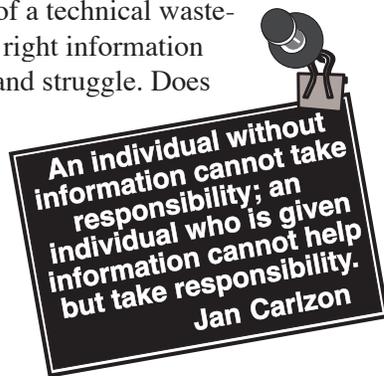
other questions it is sensible to prepare for the start of the discussions about process documentation by asking and answering 5 key questions:



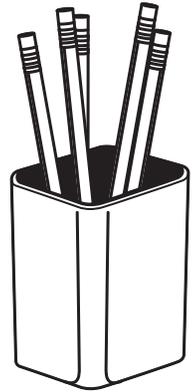
- **WHAT is the purpose?**
Is this activity necessary? How will it impact the work we do? Is it mandatory? Is everyone doing it?
- **WHERE is this being done?**
Why does it have to be done in this place? Where are the data collection manuals kept? Who is responsible for managing the manuals?
- **WHEN is it being done?**
Why is it necessary to collect information immediately after the process is complete? Why would it be less effective if we did it at the end of the shift?
- **WHO is doing this?**
Why does this person have to do it? Could someone else on the team collect the data? Who should do it? What if you do not have time?
- **HOW is it being done?**
Why are we doing it this way? Is there a simpler and a quicker way to achieve the same outcome? What alternatives are there?

In most operations, information collection and process documentation is so controversial, it is a battle ground, and it is a constant struggle for the supervisor to gather even the most basic of information. We have all painted ourselves into the corner of a technical wasteland, because without the right information the process will stagnate and struggle. Does this sound familiar?

As a professional consultant in converting, diecutting, and diemaking, my life is about solving problems and in providing answers. I was once flown across the country by a panicked customer who was diecutting a multi-layered material, combining some thin but very difficult substrates. I walked onto the press, looked at the knife in the die, told them the correct knife to use, walked

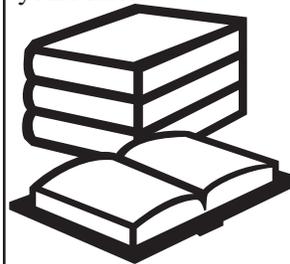


off the press, and flew home. They invested a considerable amount of money for five minutes of my time!



Who is to blame in this situation? No one in the company was aware of the specialized knife which had been designed for exactly the application they were struggling with. This one small piece of missing information eliminated any profitability on the job, and almost lost the company their largest customer. Six years later, the same company called, with a different owner and a different supervisor, but guess what, the same question!

If only they had a system for collecting readily available information, which was originally published in an industry magazine they reputedly read, this company would have avoided the first catastrophic failure, and naturally, the same information system, would have provided the documentation, specifying the correct cutting blade, six years later.



This is a common occurrence in our industry, as we are all clearly guilty of under-estimating the value of capturing and managing technical information.

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

Why are we so reluctant to integrate documentation of the process into a consistently applied personal and a professional discipline? There are probably a number of overlapping reasons for this.

- *It could simply be that capturing and recording key information and data was never part of job training and/or job specification.*
- *It could be that the organization and execution of work provides neither the opportunity nor the time to stop and record information.*
- *It could be that the management team are equally unaware of the value of process documentation and*

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therefore, neither encourage nor drive the discipline.

→ It could be that the work teams do not see the short term or the long term benefit, to what appears to be more bureaucratic excess, on top of an already difficult job.

→ It could be that all of the participants are overwhelmed by the challenge of organizing and maintaining the information resource, and do not know how to start and where to start.

There are many reasons we choose not to capture information, and all of the issues listed above are in play, however, my experience shows the primary cause is fear.

Gathering and writing information is a public demonstration of your competence, as it exposes both your knowledge and/or your lack of knowledge. Because the discipline of diecutting is such a poorly trained skill, many of the participants have a rudimentary foundation of expertise. This is just enough to get by, but certainly not enough to demonstrate a precise understanding of the process demanded by writing it down. Like the King's Clothes, everyone is aware of the problem, but as no one broaches the subject, it remains a taboo area to be avoided.

And if you can accept the realism of this description of most work teams, you can see why having a written specification for every facet of the process would be such a powerful education resource. If the information was readily available, everyone has the opportunity to learn what they did not know, and to add to the information their colleagues may not possess. There is no shame in not knowing a subject, the

The fabrication of diecut products from raw materials using skilled personnel requires precise, timely information to be generated, collected, evaluated, organized, shared, & distributed evenly, to ensure effective control of an efficient manufacturing flow.

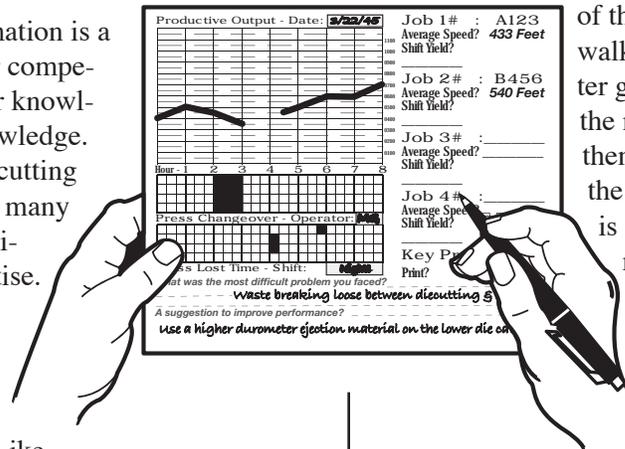
damage to ourselves, to the team and to the company, is when we have created an environment in which there is a serious inhibition to saying; **"I do not know."**

This stigma, is often the cause of inadequate training, ineffective problem solving, and in inconsistently executing tasks and duties, in which the individual is poorly qualified for.

The way we can break through these well established barriers, is by working together to build a powerful technical information resource without fear of ridicule and embarrassment. Documenting the process is a key element in building an effective changeover discipline, therefore, it is essential we start this project.

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

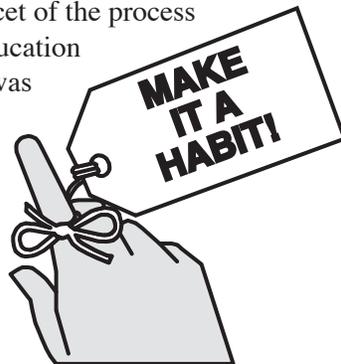
Just imagine if we could replay the scene at the beginning



of this section in which a new trainee walked into a diecutting operation. After greeting him, the supervisor shows the newcomer around the operation, then takes him to a small office just off the manufacturing area. In the room is a large folding table, with several manuals, a computer, and a projector.

The supervisor explains; **"In these books, and on the hard disk are the answers to every question you may have about the organization, our management and work teams, our products and process, and a complete technical specification for every procedure, for every tool parameter, for your job and the training programs, and the solutions for every problem we have ever faced. The last update was Friday, so everything is current."**

OK, this is a pipe dream! But we do have this information somewhere in the organization because we are running production and delivering products every day? And why is it so difficult to imagine having the bible of diecutting as our universal reference manual. This is an interesting vision of a more than possible future for our company, but how do we begin?



SUBJECT AREAS

A01	Safety & Safety Systems
A02	Teams & Teamwork
A03	Training & Skill Development
A04	Work Planning
A05	Projects & Project Planning
A06	CAD & Structural Design
A07	Diemaking & Toolmaking
A08	Pre-Press Discipline
A09	Press Changeover
A10	Press Production
A11	Quality Management
A12	Key Result Analysis
A13	Paperboard
A14	Inventory Management
A15	Information Management

The first thing we need to do is to define the areas of the operation or the process we would benefit from a more effective organization of technical information. So what are the steps we should follow to get the program of process documentation underway?

➔ **Step One: Define the Information Subjects.**

This is simply determining, what areas you are going to focus upon, and obviously the most effective way to generate this list is to communicate with the work teams and solicit their ideas and suggestions.

➔ **Step Two: Select Subject Identification Codes.**

This is designed to simplify categorization of the information for storage, management & retrieval. At the top of the page you can see a brief outline of some of the subject areas, which could be chosen in diecutting. Obviously, you can generate your own list and select the identification codes you feel are most effective.

➔ **Step Three: Divide the Major Subjects into Separate Sections.**

This is simply to refine and narrow the collection of data, and to direct our documentation toward a "Tree" of organization information. In the middle of the column you can see in the chart, we have broken the subject A09 Press Changeover from the subject area list into a sub-section identified as A09.1 Press Make-Ready Actions.

A09.1 PRESS MAKE-READY KEY ACTIONS	
A09.1.01	Deinstallation of old Tooling
A09.1.02	Cleaning & System Maintenance
A09.1.03	Installation of Tooling
A09.1.04	Loading & Qualifying Materials
A09.1.05	Press Breakdown & Resetting
A09.1.06	Tool(s) Adjustment & Modification
A09.1.07	Trial Manufacturing & Adjustment
A09.1.08	Product Inspection & Testing
A09.1.09	Production Approval Procedures
A09.1.10	Data & Information Management

A09.1.03.01 DIECUTTING TOOLING	
A09.1.03.01	Patch-Up Sheet
A09.1.03.02	Press Underlay
A09.1.03.03	"Thin" Cutting Plate
A09.1.03.04	Steel Rule Die
A09.1.03.05	Creasing Tools
A09.1.03.06	Female Stripping Tool
A09.1.03.07	Bottom Pin Stripping Tool
A09.1.03.08	Male Stripping Tool
A09.1.03.09	Female Blanking Grid
A09.1.03.10	Male Blanking Tool



➔ **Step Four: Divide each Section into Individual Categories**

As you can see from the illustration at the bottom of the page, we have broken the Press Make-Ready Section into 10 sub-categories.

➔ **Step Five: Divide each Category into Individual Disciplines.**

In this example we have taken A09.1.03 Installation of Tooling and broken it down into all the different tools used in diecutting press make-ready. Other sections could include Converting, which can be broken down into Cutting, Creasing, Scoring, Perforating, Embossing and Debossing.

➔ **Step Six: Choose the most effective format for the information collected.**

Each technical discipline will have different requirements, and as a result an information and documentation format, which will suit the type of technical data you are collecting. You may wish to know

the pressure setting on a specific die, you may wish to know how flaking was overcome on another job, you may wish to see what nick sizes and pattern worked best on a similar layout and paperboard,

you may wish to simply review a chart of crease and Matrix tool parameters. An excellent example of this sort of data collection format, in this case part of general crease specification sheet, is illustrated on the bottom of the next page.

➔ **Step Seven: Prioritize and Narrow the Data Collection Focus.**

I can imagine you are somewhat overwhelmed by the numbering system and the potential number of technical subject areas we need to document. The numbering system is simply a means of organizing storage and retrieval in a logical fashion, just like a zip code. And the number of subjects, is comprehensive, because as you

The ABC's of Fast Diecutting Press Changeover!

have front line experience with diecutting-converting, you know that this is not necessarily a simple process! But we are not in a position to immediately capture all the information we need and start documenting the process. We have to start small, and the obvious starting point is derived from the prioritized list of problems we have already determined is the first step in many of the recommendations in each section of the manual.

For example, if you had a reference file, similar to the one at the bottom of the page, which specified all of the male and female crease tool settings, for all the paperboards and all the jobs processed, and if the information was grouped by the paperboard type, by the caliber, and by the press it was run on, would that be useful? Of course it would!

The documentation should also contain information provided by suppliers, such as the paperboard sequencing Mill Specification Sheet, shown in the illustration to the right.

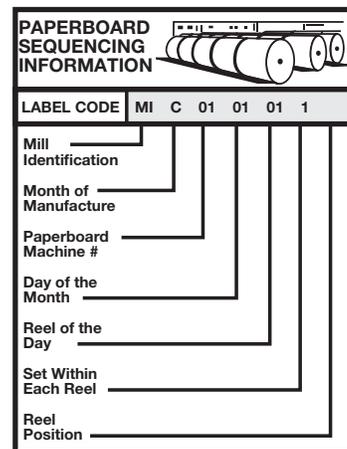
In practice, we have a lot to do in the Fast Press Changeover Project, and we have neither the time or the resources to build the "missing" process documentation database we should have had at our disposal since the beginning. But if we invest in a few hours per week, and get everyone focused upon the project, so they start col-

lecting the information they already have, we will make rapid progress.

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

In tracking down information in even the most up-to-date converting operation, I am frequently surprised to find the only diecutting documentation is written on a greasy and well worn scrap of paperboard, stuck in the back of Joe's baseball hat! This is unfortunately not unusual. If we treat diecutting as a generic process, and simply duplicate settings based upon just the caliber of the paperboard, we end up generating commodity products, and we lose out to more innovative competitors.

In my experience, the first thing we must do is to find out what we are doing now. The most innovative thing we



Caliper Range 0.011" - 0.015" 0.279 mm - 0.00 mm	Channel Width AG	Channel Width WG	Crease Point AG	Crease Point WG	Crease Height AG	Crease Height WG	Counter Thickness	Compress Gap AG	Compress Gap WG
0.011" - 0.279 Millimeter Paperboard Thickness									
Reduced Bead Virgin Fiber	0.033	0.033	3-Point	3-Point	0.926	0.926	0.010	0.001	0.001
	0.838	0.838	3-Point	3-Point	23.520	23.520	0.254	0.025	0.025
Reduced Bead Recycled Fiber	0.033	0.031	3-Point	3-Point	0.927	0.927	0.010		
	0.838	0.787	3-Point	3-Point	23.545	23.545	0.254		
Standard US Calculation	0.050	0.050	2-Point	2-Point	0.926	0.926	0.011		
	1.270	1.270	2-Point	2-Point	23.520	23.520	0.279		
Calculation 1.25 Multiple	0.042	0.042	2-Point	2-Point	0.926	0.926	0.011		
	1.060	1.060	2-Point	2-Point	23.520	23.520	0.279		
Calculation 1.50 Multiple	0.045	0.045	2-Point	2-Point	0.926	0.926	0.011		
	1.143	1.143	2-Point	2-Point	23.520	23.520	0.279		
Calculation 1.75 Multiple	0.047	0.047	2-Point	2-Point	0.926	0.926	0.011		
	1.200	1.200	2-Point	2-Point	23.520	23.520	0.279		
0.012" - 0.304 Millimeter Paperboard Thickness									
Reduced Bead Virgin Fiber	0.036	0.036	3-Point	3-Point	0.926	0.926	0.010	0.001	0.001
	0.914	0.914	3-Point	3-Point	23.520	23.520	0.254	0.025	0.025
Reduced Bead Recycled Fiber	0.036	0.034	3-Point	3-Point	0.927	0.927	0.010		
	0.914	0.864	3-Point	3-Point	23.545	23.545	0.254		
Standard US Calculation	0.052	0.052	2-Point	2-Point	0.926	0.926	0.010		
	1.321	1.321	2-Point	2-Point	23.520	23.520	0.254		
Calculation 1.25 Multiple	0.043	0.043	2-Point	2-Point	0.927	0.927	0.010		
	1.092	1.092	2-Point	2-Point	23.545	23.545	0.254		
Calculation 1.50 Multiple	0.046	0.046	2-Point	2-Point	0.927	0.927	0.010		
	1.168	1.168	2-Point	2-Point	23.545	23.545	0.254		
Calculation 1.75 Multiple	0.049	0.049	2-Point	2-Point	0.927	0.927	0.010		
	1.245	1.245	2-Point	2-Point	23.545	23.545	0.254		

can do is to use the team structure to define and prioritize the technical problems we are currently experiencing, and to ask everyone to share whatever information they have on the subject. One very effective method is to select a volunteer, and rotate the position, so whoever is doing the research will spend a few hours per week interviewing each member of the existing team.

This interview is informal, it should focus on the top problem we are investigating, and the interviewer, should use a digital tape recorder. This has the advantage of being able to be downloaded and stored for reference on a computer.

This shows respect to all of the team members and it gets them involved in this important project. There is no doubt you will be surprised how little some team members know about the subject, and you will be surprised by how

"No matter which way you examine the manufacturing process, it is a basically a linked chain of interdependent production centers. In this Customer-Supplier relationship success depends upon cooperative teamwork. Every participant needs the assistance of every other member of every other internal customer /supplier team and of each external supplier."

In the beginning, simply write the information down in any legible form, and do not concern yourself with a more sophisticated organization of the information. However, given the projected volume of information, it will prove to be an advantage to have the entire technical data base installed on a computer. This will certainly require the assistance of a computer expert,

however, the information will sit well on any major commercial data base product. This also has the advantage of providing a back-up for the information, and faster access from multiple points in the manufacturing operation.

Remember, start small, but please, start!

The Goals of Documenting the Process

"To hold a pen is to be at war." ~Voltaire

In a fundamental way, documenting the process is about equality. If everyone in the diecutting team shared all of their existing knowledge, and committed to filling in knowledge gaps, as they became clear, the performance of the team would accelerate dramatically. The ability to perform any job with confidence and competence, and to have the support of your colleagues, particularly in the face of technical adversity, is important to the self esteem of everyone who works in the operation.

People who feel good about themselves, who feel good about their team mates, and who are able to bring their best efforts to their tasks and duties, will drive continuous improvement.

It is easy to under-estimate the impact of stabilizing, standardizing, and unifying all of the technical information required to successfully complete key activities. This is in complete contrast to our current organizing structure, in which we continually re-invent the wheel as we struggle to solve problems, often previously solved by another member of the work team.

Our current system of diecutting is like driving across a foreign country without a map. You may know your destination, but the lack

much a few team members know about the subject.

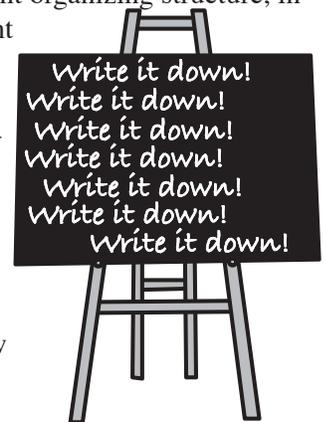
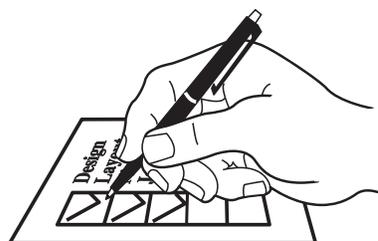
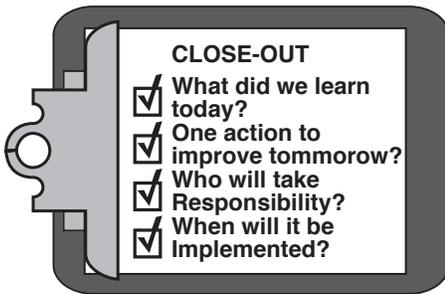
It is also useful to interview key suppliers, technical consultants, and call the association to see

what publications there may be, which are focused upon the subject your are investigating.

Just one hour a week will make an impact on the key process documentation project, and I am confident the interviews will either generate proven solutions, or provide the clues to drive testing to find the right answer to the technical problem.

And of course, when the testing is over, and the problem is solved, the information should be entered into the process documentation system!

I would certainly begin this project by simply creating a loose leaf binder, with the dividers corresponding to the different subject areas.



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of ability to select an efficient route, the difficulty of understanding and making sense of the highway signs, and the impossible task of predicting the time of arrival, make this a stressful, a debilitating and a demeaning experience. Unfortunately, even after your frustrating road trip, you do not have access to a map of the country, to learn from your experience and to do better next time.

Documenting the process is the discipline of creating and revising technical maps, which lead the entire team to the best methods, show them the most efficient way to proceed, and ensure they complete the trip on-time.

Documenting the process may seem to some an unnecessary addition of cost and resources to an already overburdened operation. However, the ability to choose the best route to success, the ability to ensure everyone in the team has the same instructions and directions, will increase productive speed and reduce operating cost, because every one in the team knows exactly how to get there from here!

Document the Process:

Methods & Practices

"I think all of us are looking at the future with yesterday's eyes." ~Dan Burrus

If we are going to be successful with this project, and to gain the maximum benefit from the time expended, it is vital to spend as much time as possible getting everyone to understand the power and the value of documenting the process. Realistically, there will always be skeptics, however, as long as they have an open mind or are not working behind the scenes to block or to sabotage the initiative, that is OK.

In most team situations, one or two team members step forward to take a leadership role, in

AGENDA GUIDELINES	
✓	<i>An agenda is issued a minimum of 24 hours prior to the meeting.</i>
✓	<i>Each item on the agenda has a brief explanation of the subject.</i>
✓	<i>A time limit is set for the meeting.</i>
✓	<i>A time limit is designated for each item on the agenda.</i>
✓	<i>Meetings begin on time.</i>
✓	<i>A meeting chairman is selected.</i>
✓	<i>If the meeting is one of a series, the minutes and the action list from the previous meeting are reviewed as the first item on the agenda.</i>
✓	<i>The discussion is confined and controlled to the meeting subjects.</i>
✓	<i>One person speaks at a time, receives the full attention of the attendees, and is allowed to finish before the next person speaks.</i>
✓	<i>A person speaks when the chairman indicates he or she can.</i>
✓	<i>At the end of each discussion, a brief statement summarizing the discussion is written down and read back to the meeting for confirmation.</i>
✓	<i>The minutes and the action list from the meeting are circulated within 24 hours of the conclusion of the meeting.</i>
✓	<i>The time, the location, and the agenda for the next meeting are determined before the meeting closes.</i>
✓	<i>Minutes are filed appropriately.</i>

whatever project is on the table. The rest of the team are usually willing to let these people do the majority of the work, and will provide their participation and support positively, but only when and if it is needed. Therefore, we need the volunteers to get the project off the ground, and to gradually convince the bystanders of the value of this initiative.

The most effective method is to get everyone together, to announce and describe the project, and to lead a brainstorming discussion, with the goal of identifying and prioritizing the top 10 technical problems. This will of course give the team their first information targets, and they should select the top five problems as the primary focus

of the first phase of information collection

The assumption is the top 10 problems are basically issues, which have not been successfully resolved. Schedule a second meeting to revise the information, which will be subsequently collected, and ask everyone not directly involved, to think about what technical information we have, and what technical information we need.

The interviews should be conducted in a professional but an informal manner to avoid making people uncomfortable with the experience.

BRAINSTORMING GUIDELINES	
✓	<i>A facilitator runs the brainstorming session, acts as the recorder, but does not participate in idea generation.</i>
✓	<i>The brainstorming objective or subject is clearly stated and clarified.</i>
✓	<i>A time limit is set.</i>
✓	<i>The team is given one or two minutes of silence to think about the subject.</i>
✓	<i>The facilitator asks for ideas, suggestions or relevant comments.</i>
✓	<i>Ideas can be suggested in an open forum of by circulating from person to person in turn.</i>
✓	<i>The ideas are clearly written and displayed on flip charts.</i>
✓	<i>There is no discussion during the brainstorming session.</i>
✓	<i>There are no criticism or reactions to ideas.</i>
✓	<i>Questions are limited to the clarification of stated ideas.</i>

The interview results are collated and documented and circulated to the work team. The second meeting is held, the ideas, and any additional information, added to the mix, and the missing information noted, and the data and the technical options are compared to the problems previously identified.

Any solutions or further research is determined by a meeting consensus, and the testing program is scheduled.

**Document the Process:
The Benefits of Change**

“What is knowledge, too, but recorded experience.” ~

The benefits of documenting the process is it eliminates a critical barrier to effective teamwork, to teambuilding, and the individual excellence. The discipline of documenting the process has a rapid and a productive impact on processing speed, on product quality and consistency, and in controlling the cost of manufacturing.



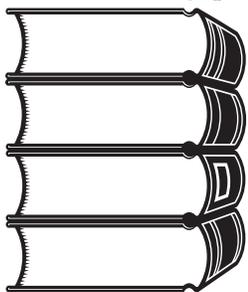
Process documentation helps to build standardization and procedural uniformity and it enables a degree of performance parity in the team, with the effect every participant can more effectively and efficiently execute their duties and responsibilities.

Process documentation levels the playing field, it reinforces the importance of cooperation and teamwork, and it makes it simpler and easier to recruit and train professional technicians.

Process documentation is a powerful diagnostic tool, as it informs us what we know, it provides a venue for ensuring everyone has access to the information, and it exposes precise gaps in our knowledge and provides the opportunity to focus on specific solutions.

Process documentation improves confidence, competence and creativity, and it makes the process easier to control and to manage.

And the bottom line, is process documentation fuels increased throughput, faster turnaround, and an steadily improving speed to market, which will energize the competitive stature of the organization.



By no means will this happen overnight, however, process improvement will be percentile of the degree to which we can consoli-

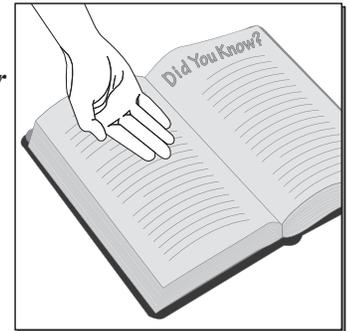
date technical data and close knowledge gaps.

**Document the Process:
Recommended Actions**

“Life is like a cash register, in that every account, every thought, every deed, like every sale, is registered and recorded.” ~Fulton J. Sheen

Like so many of the other sections of the Fast Press Changeover project, this is in principle a simple task, however, the implications of the documentation process can have a profound and a productive impact on the process and everyone involved. And this is our starting point for getting this key project underway. The steps we should consider taking are as follows:

➔ **Step One:** Circulate a notice for a team meeting, describe the goals and the benefits of the project, and ask everyone to think about the subject in preparation for a team meeting.



➔ **Step Two:** At the team meeting describe and define the Process Documentation Project.

➔ **Step Three:** Conduct a brainstorming session at the same meeting to identify the top 10 technical problems the team faces.

➔ **Step Four:** Let everyone know they will be asked to get involved, by participating in an interview with one or two of their peers, in the immediate future.

➔ **Step Five:** Ask for or select two or three volunteers to implement the start of the project.

➔ **Step Six:** Conduct all of the interviews using a tape recorder, and a list of pre-determined questions, focused on the top 10 technical problems.

➔ **Step Seven:** Collate and document a synopsis of the interview, circulate the information to the work team and schedule a second meeting.

➔ **Step Nine:** At the second meeting, brainstorm the information collected and cross reference the top

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10 problems, to determine if solutions have been generated and/or enough information to narrow the focus upon a specific production test.

Information Management Steps:

- *Step One: Define the Information Subjects.*
- *Step Two: Select Subject Identification Codes.*
- *Step Three: Divide the Major Subjects into Separate Sections.*
- *Step Four: Divide each Section into Individual Categories.*
- *Step Five: Divide each Category into Individual Disciplines.*
- *Step Six: Choose the most effective format for the information collected.*
- *Step Seven: Prioritize and Narrow the Data Collection Focus.*

In the beginning, the documentation and method of recording the information, can be as simple as a three ring binder, however, as the project grows, and the range of information increases, the team will need the help of a software expert who can customize a suitable data base for the information the teams are generating.

This program should also be able to accept and to store digital images, audio and videotape recordings.

And if you and the team have any doubts about the

power of documentation, you should review the impact on history of the Declaration of Independence, and as one of the principles, Ben Franklin so aptly stated; *“Either write something worth reading or do something worth writing.”*

Team Actions & Assignments

Date: _____ Recorded by: _____

Meeting Subject: _____

Topic 01: _____

Brief Description: _____

Main Points: 1 _____

2 _____

3 _____

4 _____

5 _____

Conclusion: 1 _____

2 _____

3 _____

4 _____

5 _____

Actions: 1 _____

2 _____

3 _____

Assignments: 1 _____

2 _____

3 _____

Section Eight:

Document the Process: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ Imagine it was your first day as a trainee in a diecutting-converting operation. You have committed to immersing yourself in a world with a unique language, with a unique measurement system, with unique rituals and traditions, and unique legends and mysterious Black Arts. You are faced with a bewildering array of processes, technology, and materials in a labyrinth like layout, which seems to be a minefield or a maze designed to intimidate and to confuse you as thoroughly as possible.
- ✓ Unfortunately, you have entered a profession with a strong aversion and a deeply rooted, paranoid fear of writing things down, and a disdain for committing critical information to paper. It is going to inhibit your training, it will undermine the performance of your job, it will make it extraordinarily difficult to be as good as you can be, it will cause you great stress and frustration, and it will undermine your job security and the viability of the company you have chosen to work for.
- ✓ In diecutting-converting the only expertise that really matters is our knowledge of all of the materials we use, and our collected information resource, which guides the transformation of material into products of higher value.
- ✓ The key point that is essential to understand, is the most valuable resource we possess is information, in the form of knowledge, skill, and experience. Our primary role in the diecutting manufacturing operation is to be a manager, supervisor, or a technician in one form or another. Our secondary role is to collect, to collate and organize our individual and team information resource.
- ✓ Realistically, there is a limit to how much information you can or you should retain about all the different processes, job details and tool parameters,

necessary to complete a production cycle. In addition, some people are more effective at retaining and retrieving information than others. As our base goal is team parity, it goes without saying, that we should be collecting and collating information, revising and purging data, and constantly improving a technical library, which is readily accessible to every team member.

- ✓ In most operations information collection and process documentation is so controversial, it is a battle ground, and it is a constant struggle for the supervisor to gather even the most basic of information. We have all painted ourselves into the corner of a technical wasteland because without the right information, the process will stagnate and struggle. Does this sound familiar?
- ✓ The first thing we need to do is to define the areas of the operation or the process which would benefit from a more effective organization of technical information. What are the steps we should follow to get the program of process documentation underway?
- ✓ The most innovative thing we can do is to use the team structure to define and prioritize the technical problems we are currently experiencing, and to ask everyone to share whatever information they have on the subject. One very effective method is to select a volunteer, and rotate the position, so whoever is doing the research will spend a few hours per week interviewing each member of the existing team.
- ✓ In a fundamental way, documenting the process is about equality. If everyone in the diecutting team shared all of their existing knowledge, and committed to filling in knowledge gaps, as they became clear, the performance of the team would accelerate dramatically. The ability to perform any job with confidence and competence, and to have the support of your colleagues, particularly in the face of technical adversity, is important to the self esteem of everyone who works in the operation.

Section Eight:

Document the Process: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Describe how the documentation of process information is handled in the operation in which you work?
 - ✓ What information do you use in the execution of your job, and what information do you generate as part of your role in the organization?
 - ✓ Do you feel this is a worthwhile project?
 - ✓ What is one of the important ways to classify manufacturing?
 - ✓ Do you believe everyone in every department has all of the information they need, and/or the ability to quickly access that information?
 - ✓ How cooperative are your colleagues in collecting and managing information?
 - ✓ Describe some of the reasons you feel your colleagues may be reluctant to participate in a project of this type?
 - ✓ Describe some of the recommend steps and actions in cataloging and categorizing technical information?
- ✓ How do you feel an effective process documentation system would impact training and skill development?
 - ✓ How do you feel an effective process documentation system would impact standardization, and simplification of the diecutting-converting process?
 - ✓ Describe one or two ingredients of an effective meeting agenda?
 - ✓ Describe one or two ingredients of an effective brainstorming meeting?
 - ✓ Do you feel the use of an interview by one of their own colleagues would help or hinder in the collection of information?
 - ✓ How cooperative are your colleagues in collecting and managing information?

Manufacturing System of Organization

Section 09: Information Management

Key Definitions: ... knowledge of specific events or situations that has been gathered or received by communication; intelligence or news ... knowledge derived from study, experience, or instruction ... the act of informing or the condition of being informed ... a collection of facts from which conclusions may be drawn ... a collection of facts or data ... data storage/retrieval ...

The Information Management Mission: "It is the mission to develop an up-to-date information and data management system, which will accurately document every key performance parameter of the tools, the materials, the products, the technology, the teams, and their methods and practices, to provide the information, which will drive performance improvement."

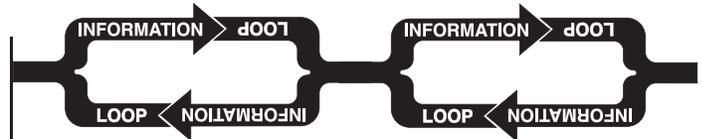
Information Management: An Overview
"Get the facts, or the facts will get you. And when you get 'em, get 'em right, or they will get you wrong."
~Thomas Fuller

A day in the life of the CAD Designer, the Diemaking Toolmaker, the Pre-Press facilitator, and the Diecutting Technician is usually densely crammed, with a wide range of diverse activity, all executed at a furious pace. This converting-manufacturing treadmill will include problem solving and brainstorming; research and testing; developing new methods and procedures; coaching, learning and teaching; not to mention one other slightly important issue, production!

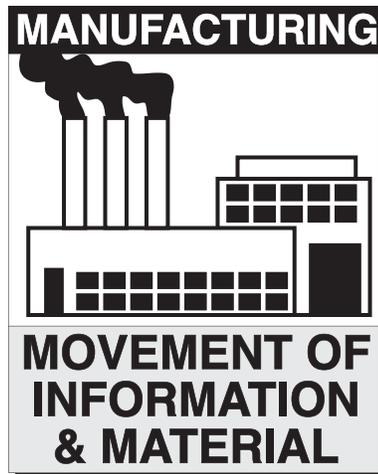
This activity is what is called, getting experience! In practice, the ability of each individual to play an effective team role in this fast flow process is based upon the ability to rapidly assimilate new ideas, and to quickly turn new knowledge and solutions into practical improvements to the diecutting process.

To gain maximum education and experience benefit, from every hour of every day, it is important the professional crafts person understands the underlying principles of the manufacturing process. In the most basic and the most important terms, manufacturing is simply about the movement of information and material.

It does not matter if the operation is producing automo-



biles, doughnuts, cell phones, furniture, strawberry jam or sunglasses; manufacturing is about adding value to raw materials by transforming the material into a product of higher value. The information is used as the guide, the instructor, the controller, and the blueprint or map of activity.

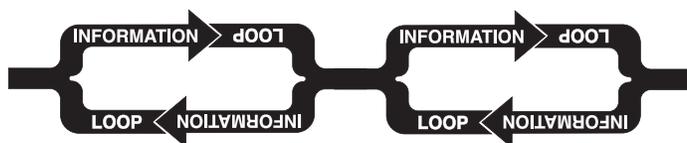


In manufacturing, we have several different types of information. There is the initial burst of customer information, which instigates the beginning of the production process. The information is then filtered, transformed, manipulated, and converted, by each functional area of the converting operation, into the plans and actions, which will instigate the beginning of each process.

The customer service technician must transform the information into a prototype; the estimator must translate the information into

a job order and outline; the financial team must translate the information into costs and cash flow; the graphic designer must convert the customer concept into a specific image; the printer must convert the information into film, plates, and ink; and so on throughout the process. This information processing discipline enables each department, each work team, and each individual to add value to the process as the emerging product passes through their control.

This data processing activity is called the Information Cascade, as the information management discipline seeks to specify, to define, and to identify the essential flow of data through the entire organization.



The ABC's of Fast Diecutting Press Changeover!

Information Management:

Problems & Solutions

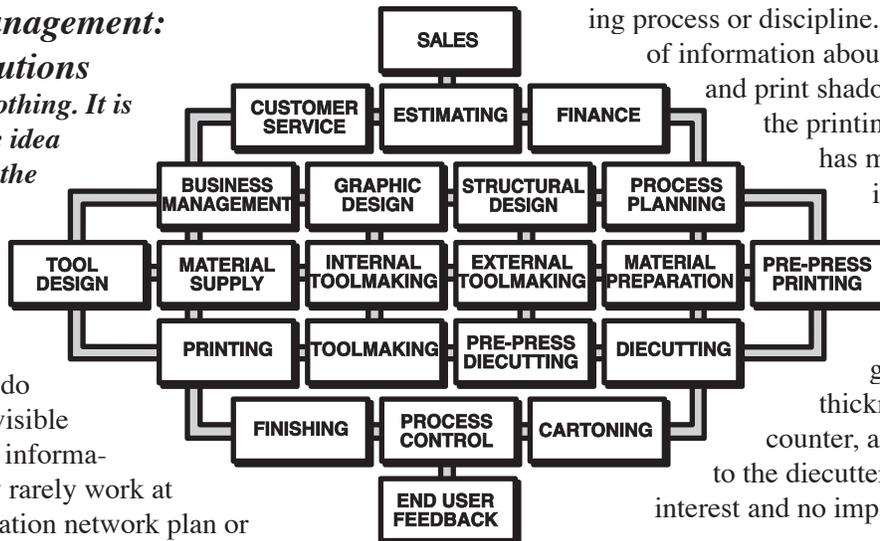
“A fact in itself is nothing. It is valuable only for the idea attached to it, or for the proof which it furnishes.” ~Claude Bernard

It is unfortunate that most companies do not recognize this invisible network or stream of information. As a result, they rarely work at generating an information network plan or a map showing the arterial flow of information and data flowing from the customer, through the supplier loop, through the converting organization, and back to the customer in the form of the products they ordered.

Not only are companies, work teams, and individuals, guilty of often underestimating the importance of this critical resource; they have no proven collection system, ineffective methods of filtering and evaluating the data; no storage vault, with security of course; no access plan; no back-up procedures; and no distribution network, designed to capture, consolidate, and redistribute data to continuously improve knowledge, skill and experience.

The information system should obviously be visible and not invisible; the data network should be valued as a key resource attribute of the organization; the collection, consolidation and rapid re-distribution of critical information must be viewed as an organizational priority; and everyone involved in converting must aggressively collect and manage information.

In this information network much of the data, particularly the technical data is specific to each separate convert-



ing process or discipline. Clearly the value of information about dot gain, bleeds, and print shadowing is critical to the printing department, but has minimal interest or no impact in diecutting. Conversely, the bevel angle of the steel rule knife, the width of the cross grain nicks, and the thickness of the crease counter, are critically important to the diecutter, but have minimal interest and no impact in printing.

In the previous section we discussed documenting the process, which is primarily focused upon the technical data base we need to be effective, to manage and to improve in diemaking and diecutting. If we examine the diagram above, each separate discipline or department needs and develops information, which flows from one function to the next, and from the start of the process to the end of the process. But within each function is a separate but integrated technical and performance information system, which is specific and critical to the function of that part of the process.

We need to understand how we use information within diecutting converting, where the information we receive comes from, how to qualify and verify the data, and how to pass on information we have generated or modified, which is critical to processes down the line.

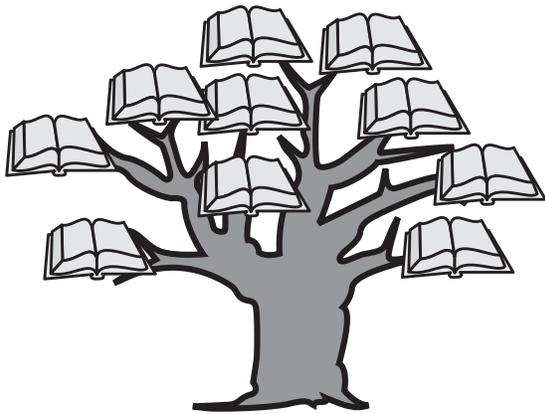


PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

There are three key problems inherent to the current lack of information focus. These are:

- ➔ *First, we simply do not see knowledge, skill, and experience and training as primarily an information issue.*

- *Second, as we do not recognise the information resource, we do not know what information we have.*
- *Third, as we do not recognise the information resource, we do not know, what information we are missing.*
- *Fourth, as information management is not seen as a key issue at the technical level of diecutting converting, we do not have a system to identify, to collect and to collate the data.*



So the primary problem is, we under-estimate and we undervalue, the critical resource, which makes manufacturing an effective process.

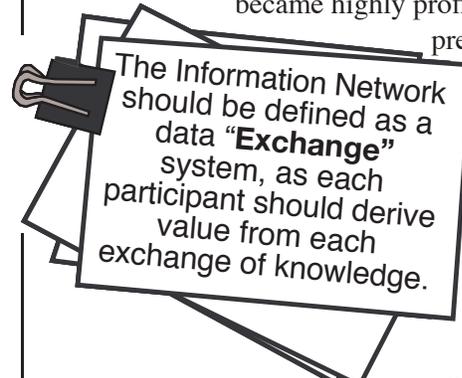
The second major problem in our dysfunctional system of manufacturing, is as information is the life blood of the system, we are unaware of the danger of low blood count, and equally blind to the threat from a continual hemorrhage. Why is this so critical you may ask?

I was asked to work with a group of diecutters, who I was informed by their manager; *“They, Need Training!”* When I get to the operation, I find the team is struggling with setting and sustaining a stable cutting make-ready.

I immediately demonstrate press calibration, using whatever tools and materials are available. We then examine the steel rule die for the next make-ready and properly level the die, so it will function on press reliably. We then do a make-ready, using Two-Sheet Patch-Up as the primary method of press leveling. The Make-Ready is fast, simple and straightforward.

The comments of the operators were either; *“I have never seen these methods before,”* or; *“I wish someone had*

shown these techniques to me before today.” This team of operators were transformed in less than 6 hours, from a group who struggled with press make-ready, to a group who, with a little more practice of what they were shown, became highly proficient at fast, kiss-cut press make-ready.



The manager was delighted then, and even happier over the next several weeks, as the team assimilated the new methods and practices, and steadily increased speed,

quality, and throughput. My question to you however; *“Was this Training or Information management?”*

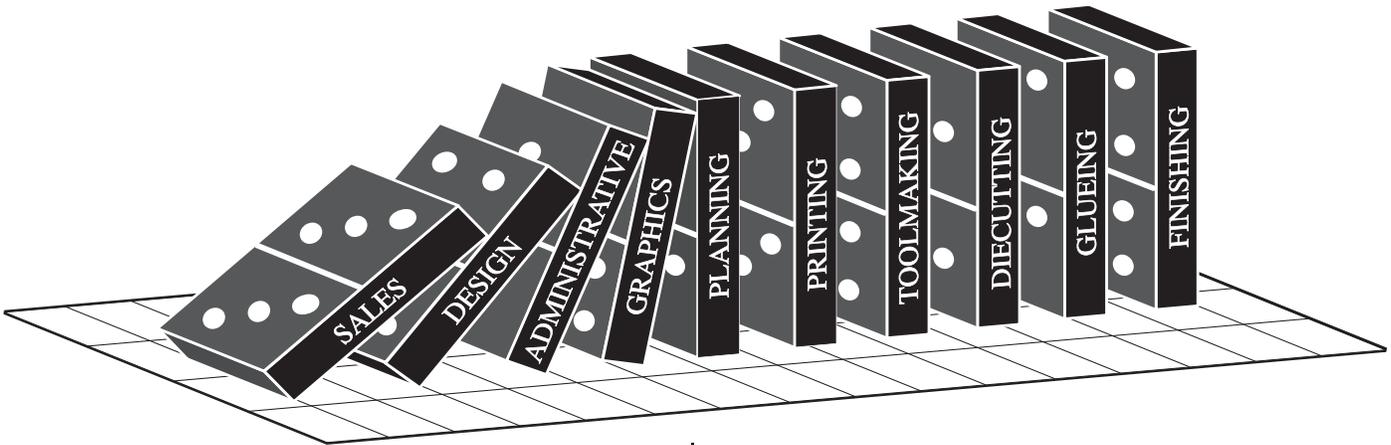
My vote is solidly that this is information management. I did not really teach them anything about the basics of diemaking, diecutting, or converting. I simple showed this team an alternative method of doing what they were already doing, however, in a more effective manner. Remember, we described training in an earlier section as the *Development of or the Modification of Behavior*, and we agree, *developing new behavior* or an *instinctive habitual change*, needs time. But as soon as this team watched what I did, light bulbs started to go off, and by the end of our time together, they were more than proficient.

When your organization talks about training, even though they may not understand it, they are actually discussing information management. It also should be no surprise, that our ability to solve perennial problems, our ability to innovate and our ability to drive process improvement, is severely limited, when we have such a poor understanding of the basic structure of manufacturing.

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

This inability to see information as a highly valuable resource in diecutting-converting more than likely stems from the transition from a traditional manufacturing operation, to an operation significantly impacted by advanced technology and Computer-Aided Design and





Computer-Aided-Manufacturing, and more importantly, Computer-Integrated-Manufacturing. The *Traditional Domino Operating Structure*, see above, was a sequential, relatively slow, step-by-step process, with a limited number of orders being processed, utilizing slower and less flexible equipment, and with several weeks to complete each production job, from order to delivery.

The advanced and rapidly changing diecutting-converting operation is a *Hub & Spoke Operating Structure*, see below, in which numerous orders are being processed simultaneously, it utilizes more efficient and more flexible computer controlled technology, and it has to be fast and furious, because turnaround is days rather than weeks.

In the Domino Manufacturing System, information was still critical to success, but with simpler products, with more people, with more time, a breakdown in communications would not always generate a serious problem.

However, in the Hub & Spoke Operating System, information, particularly because of computerization, is critically important, the products are far more complex and sophisticated, there are less people, and a breakdown in communication almost always leads to a serious delivery and cost overrun problem.

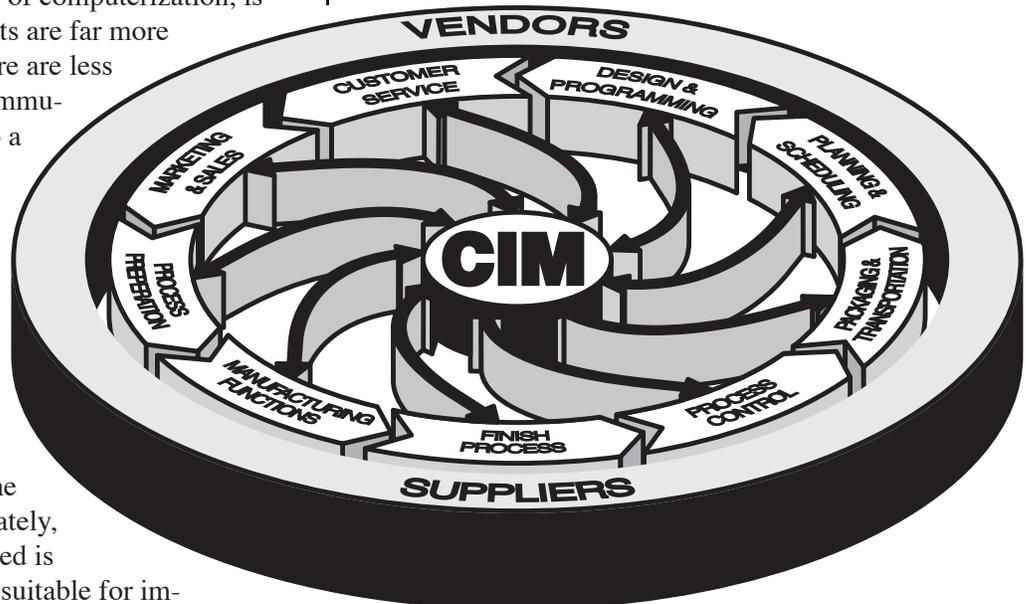
In addition, with the proliferation of computer technology and computer skill, many customers and agencies are designing their own graphics and structural design, and communicating directly with the converting company. Unfortunately, much of the information received is neither well organized nor is it suitable for im-

mediate insertion into the manufacturing chain.

Given this dramatic and continually changing reliance on computer-integrated communication, design, and manufacturing, our slow pace in adapting to the Information Highway, results in our driving down some pretty bumpy and very remote country roads!

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

Effective information management is impossible without effective teamwork. Therefore, the first step in reorganizing the flow of information in diecutting-converting, is to get the entire diecutting converting team together, including representatives of the internal supplier-customer chain. The goal is to explain the project, and to define the series of team activities and milestones, as the information project is developed and consolidated.



The steps in the process include:

→ **Define, discuss, and brainstorm ...**

- * *The importance of accurate, up-to-date information, to effective work planning and organization; and to process control?*
- * *How accurate information can productively impact every diecutting-converting activity?*
- * *How accurate information can simplify and reduce process and processing complexity?*
- * *How accurate information can make the job easier, how it can reduce stress and how it can reduce frustration?*
- * *How accurate information can make the company faster, better, and more competitively secure?*

→ **Define, discuss, and brainstorm ...**

- * *How we currently use information?*
- * *How we manage the information resource to ensure the right information is in the right place at the right time?*
- * *How we gather information, how we apply it, and how we organize the resource?*
- * *How we assess, verify and validate the accuracy of the information we accept?*
- * *How we generate information, how we disseminate it, and how we organize the resource?*
- * *How we assess, verify and validate the accuracy of the information we deliver?*
- * *How we consolidate, organize, protect, and secure the information resource?*

INFORMATION MANAGEMENT QUESTIONS	
<input checked="" type="checkbox"/>	How important is information management?
<input checked="" type="checkbox"/>	How do we use information in diecutting?
<input checked="" type="checkbox"/>	How do we collect the information we have?
<input checked="" type="checkbox"/>	How do we know the information is correct?
<input checked="" type="checkbox"/>	How do we know we have all the information?
<input checked="" type="checkbox"/>	How do we process & verify the information?
<input checked="" type="checkbox"/>	How do we purge & upgrade the information?
<input checked="" type="checkbox"/>	How do we manage the information resource?
<input checked="" type="checkbox"/>	How is information responsibility assigned?
<input checked="" type="checkbox"/>	How do we find information we do not have?

→ **Define, discuss, and brainstorm ...**

- * *How to classify and to categorize information used in the diecutting-converting process?*
- * *How to identify the primary source for each category of information delivered?*
- * *How we assign responsibility for the control and delivery of information?*

- * *How to identify the primary source for each category of information transmitted?*
- * *How we assign responsibility for the control and delivery of this information?*

TYPES OF INFORMATION	
<input checked="" type="checkbox"/>	The Converting-Manufacturing Process
<input checked="" type="checkbox"/>	Safety Systems & Wellness Management
<input checked="" type="checkbox"/>	Quality Management & Education
<input checked="" type="checkbox"/>	Customer-Supplier Chain (Internal)
<input checked="" type="checkbox"/>	Customer-Supplier Chain (External)
<input checked="" type="checkbox"/>	CIM-CAD & Structural Design
<input checked="" type="checkbox"/>	Tool Specification & Design
<input checked="" type="checkbox"/>	Tool Converting Parameters
<input checked="" type="checkbox"/>	Tool Machining & Fabrication
<input checked="" type="checkbox"/>	Tool Materials & Components
<input checked="" type="checkbox"/>	Tool Preparation & Management
<input checked="" type="checkbox"/>	Toolmaking & Processing Technology
<input checked="" type="checkbox"/>	The Toolmaking Manufacturing Process
<input checked="" type="checkbox"/>	Diecutting & Processing Technology
<input checked="" type="checkbox"/>	Diecutting System Maintenance
<input checked="" type="checkbox"/>	The Diecutting Manufacturing Process
<input checked="" type="checkbox"/>	Product & Packaging Applications
<input checked="" type="checkbox"/>	Diecut Material & Manufacturing
<input checked="" type="checkbox"/>	Training & Skill Development
<input checked="" type="checkbox"/>	Teambuilding & Teamwork
<input checked="" type="checkbox"/>	Problem Solving, Research & Testing
<input checked="" type="checkbox"/>	Work Planning & Work Organization
<input checked="" type="checkbox"/>	Process Improvement & Benchmarking

→ **Define, discuss, and brainstorm ...**

- * *How the barriers and obstacles to the flow of information impact diecutting converting?*
- * *How previous or existing initiatives are changing the status and the delivery of information?*
- * *How we identify key weaknesses and key remedial actions to improve the timely flow of accurate information?*

→ **Define, discuss, and brainstorm ...**

- * *How variable performance in the various categories of diecutting and processing information, impact productivity and quality?*
- * *How to list, organize and prioritize the information categories, requiring reorganization and improvement?*

→ **Define, discuss, and brainstorm ...**

- * *Evaluate the top information category ...*
 - *How we use information in this discipline?*
 - *How incorrect, missing, or the late arrival of information causes problems in this discipline?*

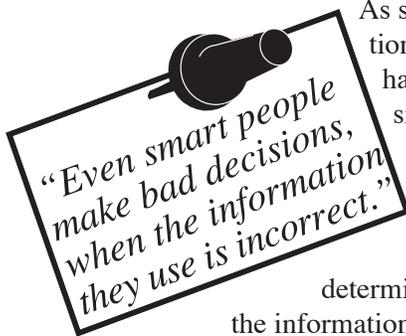
The ABC's of Fast Diecutting Press Changeover!

- How we could restructure the system of information in this discipline to improve processing performance?

→ Define, discuss, and brainstorm ...

- * How we prioritize action in this initiative?
- * How we select who is to lead this initiative?
- * How we select who will be part of the project team?
- * How we determine what are the resources available to the team?
- * How do we determine the goals of the information management project?
- * How we select practical projected project milestones and deadlines?
- * How we determine when the project begins?

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...



As soon as the Information Management project has started, we should simultaneously audit each discipline within the entire converting process and within each department, to determine the current state of the information resource. However, as the focus of this process improvement initiative is on fast press changeover, and there are many other important projects being implemented simultaneously throughout the operation, it would be wise to limit the scope of the initiative.

Therefore, we should ask a representative from each of the internal Supplier-Customer Chain disciplines, and particularly those departments that interact directly with the diecutting discipline, to identify and to collect all information which effects or directly impacts diecutting. While this may appear to be a challenging requirement because the information and technical data source is so poorly organized, the effort required will be minimal, as will the value of the information it yields.

However, as the project grows in the scope and the depth of information research about the diecutting and related processes, these individuals and teams will prove invaluable in building an information network.

The Goals of Information Management

"Facts have a cruel way of substituting themselves for fancies. There is nothing more remorseless, just as there is nothing more helpful, than truth." ~William C. Redfield

Information is a key resource, which plays a vital and a productive role in converting manufacturing. Improving the accuracy, the timeliness, and the seamless flow of technical data from one application to the next, accelerates the speed and the quality of every activity.

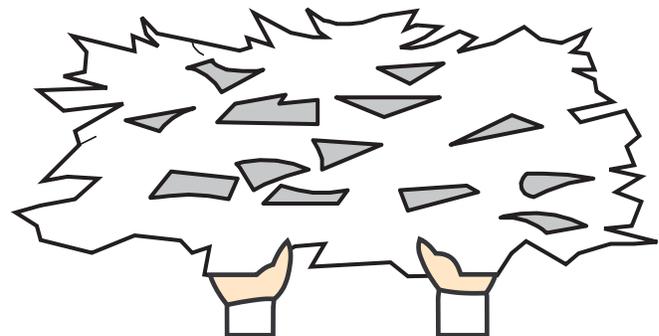
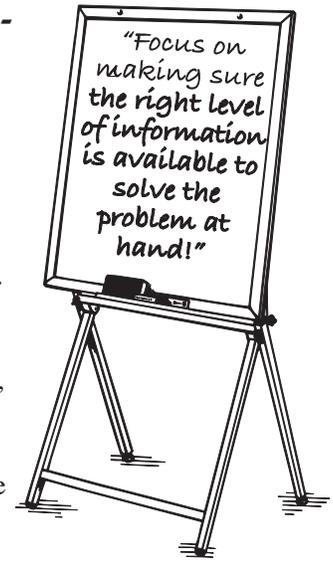
How does this information system impact each activity in the production chain?

Effective information management ensures each task, each activity and each process can flow at maximum efficiency. Information is like a lubricant which keeps the system of manufacturing in optimal operating condition.

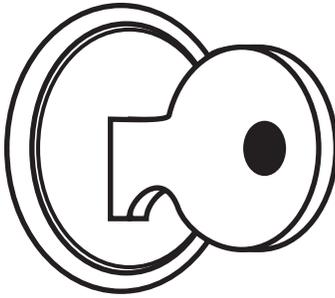
Effective information management minimizes mistakes, errors and poor performance caused by a breakdown in the flow, the delivery and/or the accuracy of the information.

Effective information management ensures every production cycle collects, reviews, upgrades and consolidates the information resource, and exposes weaknesses or breakdowns in the bi-directional flow of information between applications.

Effective information management empowers each and every individual and team as it ensures no matter what they are doing, they have the right information and data to proceed fluidly and successfully from task to task.



Effective information management ensures individuals and teams recognize their responsibility to send new and revise information to the appropriate source.



Effective information management ensures the process is as fast as possible, it is as simple as possible, and it is as effective as possible.

Effective information management ensures every individual and team has the information and the data to maximize their knowledge, to develop their skills, and to expand their experience.

Effective information management ensures the company will gradually develop the fastest speed to market, the lowest operating cost, and will consolidate a reputation as a top echelon folding carton or corrugated container supplier.

This information management project poses very tough questions, but questions which need to be asked. In practice it asks the questions we have often avoided because answering them is difficult. As Winston Churchill noted; *“True genius resides in the capacity for evaluation of uncertain, hazardous, and conflicting information.”*

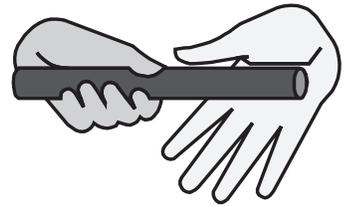


Information Management: Methods & Practices

“If you get all the facts, your judgment can be right; if you don’t get all the facts, it can’t be right.” ~Bernard M. Baruch

This is a project which casts a wide net, and a project which will force many decisions into the open, about every part of the converting system. Therefore, it is sensible to start the project in a measured, pedantic, and step-by-step manner, utilizing low tech tools and methods. As we gain more knowledge about information sources and resources, we can then develop a computerized information system. However, in the beginning the information and

the collection system should be basic and straightforward. Therefore, some of the methods and practices employed should include:



- ➔ *Each information category should be stored in a single three ring binder, with each divider corresponding to a classification of information from that category.*
- ➔ *The manuals should be upgraded weekly.*
- ➔ *The manuals should be upgraded, purged and duplicated monthly.*
- ➔ *One person from each department, and wherever necessary, from each shift, is assigned the responsibility of managing the information resource.*
- ➔ *As the information resource takes shape, the information system can be organized and formatted to fit onto a standard commercial data base.*
- ➔ *As computerization of the information resource takes shape, information resource access points throughout the operation should be planned.*
- ➔ *At the access points, data is allowed to be accessed, entered, and printed, however, information will only become a permanent part of the resource, as it is approved by the key information manager appointed within each discipline.*
- ➔ *To keep the information resource as updated as possible, the consolidation of new data and the revision of existing data, must be completed weekly.*
- ➔ *All manuals, worksheets, and documentation tools must be scanned and entered into the database as accessible and printable PDF files.*
- ➔ *System back-ups are automatically scheduled daily, and run invisibly in the background.*
- ➔ *All information is copyrighted and password protected.*
- ➔ *As the information resource is developed it may be necessary to provide access to the data base using a scanned, identification card. This will qualify the user to the level of information he or she is authorized to access and to enter.*

A decision is an action you must take when you have information so incomplete that the answer does not suggest itself.

Naturally, the design and the use of the information system will grow at the speed of the organization effort which is applied to it. The simple

Naturally, the design and the use of the information system will grow at the speed of the organization effort which is applied to it. The simple

The ABC's of Fast Diecutting Press Changeover!

3-Ring Binder information system may also prove to be effective for some organizations for an extended period of time, however, computerization provides a more efficient method of providing a seamless network of input and of access.

Information Management: The Benefits of Change

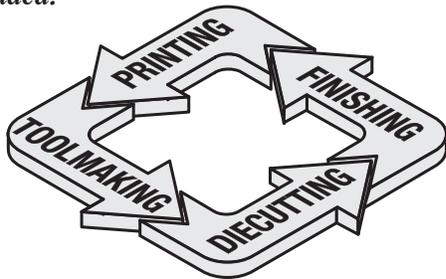
"I have but one lamp by which my feet are guided, and that is the lamp of experience. I know of no way of judging the future but by the past."

~Patrick Henry

Because Information Management is so poorly executed in the majority of diecutting-converting operations, it is difficult to convince experienced craftsmen and women that the investment in time and effort into this project will yield tangible results. Although there are numerous arguments and many examples of the benefits, inevitably it is the proof delivered by practical evidence in diecutting, which will convince even the most skeptical participant. However, as you prepare to start the information management initiative, the following are experiences derived by participants.

An effective information/data management system will ensure ...

- *Every activity and production cycle can add value as the information resource is continually upgraded.*



- *Faster training and retraining of key personnel and replacement personnel as comprehensive data simplifies teaching and learning.*
- *A conversion of non-value added activity to value added activity, as the information resource eliminates potential error and waste, and maximizes the value of every man-hour.*
- *A faster response to customer needs and greater speed to market as the flow of data reduces the*

complexity of preparation and execution of each production cycle.

- *The cost of diecutting-converting is continually reduced as the flow of information helps to improve the efficient use of all resources to generate greater process and product consistency.*

- *The stress, frustration, and fatigue of struggling with technical problems and poor organization are reduced cycle-by-cycle.*

- *A continuous reduction in Cycle Time as the man-time and the man-hours required to complete key tasks is reduced through one-touch processing.*

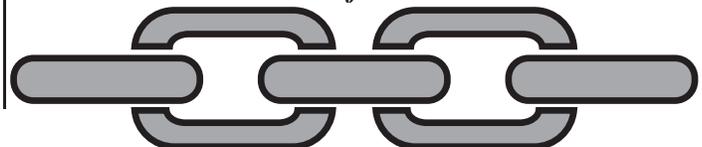
An effective information management system will ensure all of these improvements, and the growth of technical prowess will generate greater quality and increased innovation at every stage of the manufacturing process.

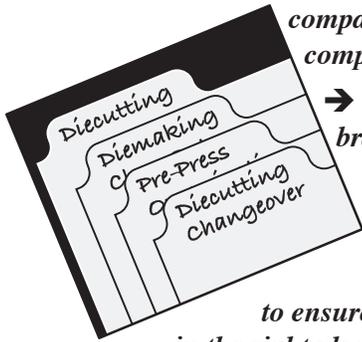
Information Management: Recommended Actions

"People will make reasonable decisions if they are given proper information." ~Thom Serrani

In getting the information project underway the recommendations concentrated on team formation and team activity, directed at starting, organizing and implementing the project. These steps included the following actions:

- *Define, discuss, and brainstorm ...*
 - * *The importance of accurate, up-to-date information to effective work planning and organization; and to process control?*
 - * *How accurate information can productively impact every diecutting-converting activity?*
 - * *How accurate information can simplify and reduce process and processing complexity?*
 - * *How accurate information can make the job easier, how it can reduce stress and how it can reduce frustration?*
 - * *How accurate information can make the*





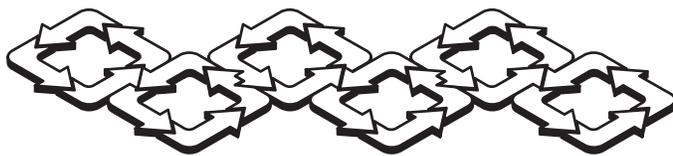
company faster, better, and more competitively secure?

→ Define, discuss, and brainstorm ...

- * How we currently use information?
- * How we manage the information resource to ensure the right information is in the right place at the right time?
- * How we gather information, how we apply it, and how we organize the resource?
- * How we assess, verify and validate the accuracy of the information we accept?
- * How we generate information, how we disseminate it, and how we organize the resource?
- * How we assess, verify and validate the accuracy of the information we deliver?
- * How we consolidate, organize, protect, and secure the information resource?

→ Define, discuss, and brainstorm ...

- * How to classify and to categorize information used in the diecutting-converting process?
- * How to identify the primary source for each category of information delivered?
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- * How to identify the primary source for each category of information transmitted?
- * How we assign responsibility for the control and delivery of this information?



→ Define, discuss, and brainstorm ...

- * How the barriers and obstacles to the flow of information impact diecutting converting?
- * How previous or existing initiatives are changing the status and the delivery of information?
- * How we identify key weaknesses and key remedial actions to improve the timely flow of accurate information?

→ Define, discuss, and brainstorm ...

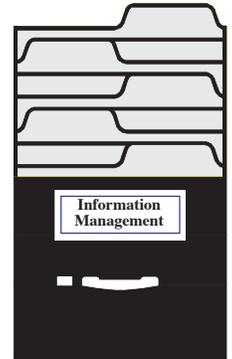
- * How variable performance in the various categories of diecutting and processing

information, impact productivity and quality?

- * How to list, organize and prioritize the information categories requiring reorganization and improvement?

→ Define, discuss, and brainstorm ...

- * Evaluate the top information category ...
 - How we use information in this discipline?
 - How incorrect, missing, or the late arrival of information cause problems in the discipline?
 - How we could restructure the system of information in this discipline to improve processing performance?



→ Define, discuss, and brainstorm ...

- * How we prioritize action in this initiative?
- * How we select who is to lead this initiative?
- * How we select who will be part of the project team?
- * How we determine what are the resources available to the team?
- * How do we determine the goals of the information management project?
- * How we select practical projected project milestones and deadlines?
- * How we determine when the project begin?

The recommendations in terms of implementation of the project strongly emphasized the importance of simplicity and starting slowly and steadily, using traditional methods in the beginning. The recommendations were:

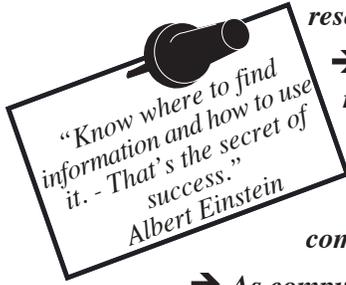
→ Each information category should be stored in a single three ring binder, with each divider corresponding to a classification of information from that category.



→ The manuals should be upgraded weekly.

→ The manuals should be upgraded, purged and duplicated monthly.

→ One person from each department, and wherever necessary, from each shift is assigned the responsibility of managing the information



resource.

→ *As the information resource takes shape, the information system can be organized and formatted to fit onto a standard commercial data base.*

→ *As computerization of the information resource takes shape, information resource access points throughout the operation should be planned.*

→ *At the access points data is allowed to be accessed, entered, and printed, however, information will only become a permanent part of the resource, as it is approved by the key information manager appointed within each discipline.*

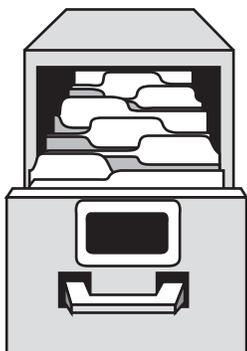
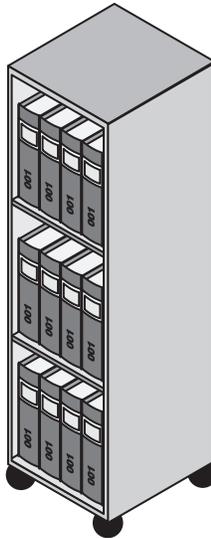
→ *To keep the information resource as updated as possible, the consolidation of new data and the revision of existing data, must be completed weekly.*

→ *All manuals, worksheets, and documentation tools must be scanned and entered into the database as accessible and printable PDF files.*

→ *System back-ups are automatically scheduled daily, and run invisibly in the background.*

→ *All information is copyrighted and password protected.*

→ *As the information resource is developed, it may be necessary to provide access to the data base using a scanned, identification card. This will qualify the user to the level of information he or she is authorized to access and to enter.*



William Feather; *“An education isn’t how much you have committed to memory, or even how much you know. It’s being able to differentiate between what you do know and what you don’t. It’s knowing where to go to find out what you need to know; and it’s knowing how to use the information you get.”*

Section Nine:

Information Management: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ To gain maximum education and experience benefit from every hour of every day, it is important the professional crafts person understands the underlying principles of the manufacturing process. In the most basic and the most important terms, manufacturing is simply about the movement of information and material.
- ✓ In manufacturing, we have several different types of information. There is the initial burst of customer information, which instigates the beginning of the production process. The information is then filtered, transformed, manipulated, and converted, by each functional area of the converting operation, into the plans and actions, which will instigate the beginning of each process.
- ✓ It is unfortunate that most companies do not recognize this invisible network or stream of information. As a result, they rarely work at generating an information network plan or a map showing the arterial flow of information and data flowing from the customer, through the supplier loop, through the converting organization, and back to the customer in the form of the products they ordered.
- ✓ We need to understand how we use information within diecutting converting, where the information we receive comes from, how to qualify and verify the data, and how to pass on information we have generated or modified, which is critical to processes down the line.
- ✓ When your organization talks about training, even though they may not understand it, they are actually discussing information management. It also should be no surprise, that our ability to solve perennial problems, our ability to innovate, and our ability to drive process improvement, is severely limited, when we have such a poor understanding of the basic structure of manufacturing.
- ✓ The **Traditional Domino Operating Structure** was a sequential, relatively slow, step-by-step process, with a limited number of orders being processed, utilizing slower and less flexible equipment, and with several weeks to complete each production job, from order to delivery.
- ✓ In the Domino Manufacturing System, information was still critical to success, but with simpler products, with more people, with more time, a breakdown in communications, would not always generate a serious problem.
- ✓ The advanced and rapidly changing diecutting-converting operation, is a **Hub & Spoke Operating Structure**, in which numerous orders are being processed simultaneously, it utilizes more efficient and more flexible computer controlled technology, and it has to be fast and furious, because turnaround is days rather than weeks.
- ✓ In the Hub & Spoke Operating System, information, particularly because of computerization, is critically important, the products are far more complex and sophisticated, there are less people, and a breakdown in communication, almost always leads to a serious delivery and cost overrun problem.
- ✓ Effective information management is impossible without effective teamwork. Therefore, the first step in reorganizing the flow of information in diecutting-converting is to get the entire diecutting converting team together, including representatives of the internal supplier-customer chain. The goal is to explain the project and to define the series of team activities and milestones, as the information project is developed and consolidated.
- ✓ As soon as the Information Management project has started, we should simultaneously audit each discipline within the entire converting process and within each department, to determine the current state of the information resource.

Section Nine:

Information Management: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ What role does information play in diecutting-converting?
- ✓ Give three examples of information used in structural design, diemaking or diecutting?
- ✓ Why is the Information System called a Cascade?
- ✓ Give three examples of how you currently use information, in the execution of your job?
- ✓ Can you describe how a better, a more complete, or a more timely delivery of information, would help in your duties?
- ✓ Who is responsible for information management in the area you work in?
- ✓ How do you personally collect and use technical data and information?
- ✓ How do you verify and validate the information you rely upon?
- ✓ How is the information resource collected and documented in your work area?
- ✓ How is training, teaching and learning closely tied to sound information?
- ✓ How would you describe the advantages and the disadvantages of the Domino Operating System?
- ✓ How would you describe the advantages and the disadvantages of the Hub & Spoke Operating System?
- ✓ Is there a central information resource available to you and/or how do you collect the information you need to complete each key activity?
- ✓ Can you provide three examples of how missing or incorrect information has caused a serious problem in diecutting-converting?
- ✓ Can you name 5 categories or classifications of the type of information required in the diecutting-converting process?
- ✓ Give two examples of the goals of information management?
- ✓ How would you describe the advantages of having your information needs organized on a easily accessible computer system?
- ✓ Give three benefits of implementing an information management development project in your organization?

Manufacturing System of Organization

Section 10: Time Management

Key Definitions: ... the favorable or appropriate moment to do something ... a limited period during which an action, process, or condition exists or takes place ... the length of time taken to complete an activity ... to measure how long it takes for something to happen or for someone to do something ... a system or method of measuring/managing the passage of time

The Time Management Mission: "It is the mission to develop a system of manufacturing built around benchmarked time standards, and to use the measurement of elapsed time and activity time, to accelerate, to simplify and to streamline the process and all activity, to reduce resource waste, to improve quality, to increase productive speed, and to reduce operating cost."

Time Management: An Overview

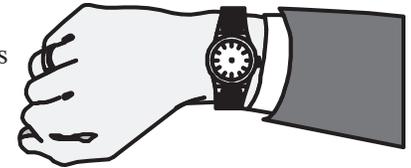
"The illimitable, silent, never-resting thing called time, rolling, rushing on, swift, silent, like an all embracing ocean tide." ~Thomas Carlyle

One of the few guarantees in life is the equality of time. Everyone, from the rich and famous, to the poor and the unknown foot soldier, receives an identical daily allocation of seconds, minutes and hours. The great unknown of course, is how and when this resource will become superfluous, as we are no longer here to *spend* our time. The recognition of the irreplaceable volatility of our time and our lives, adds to the stress and frustration of daily living, as we try to "*manage & control*" this resource. Unfortunately, a quote by Henry Austin Dobson illustrates our dilemma; "*Time goes, you say? Ah, no! Alas, Time stays, we go!*"

For everything there is a season,
And a time for every matter under heaven:
A time to be born, and a time to die;
A time to plant, and a time to pluck up what is planted;
A time to kill, and a time to heal;
A time to break down, and a time to build up;
A time to weep, and a time to laugh;
A time to mourn, and a time to dance;
A time to throw away stones, and a time to gather stones together;
A time to embrace, And a time to refrain from embracing;
A time to seek, and a time to lose;
A time to keep, and a time to throw away;
A time to tear, and a time to sew;
A time to keep silence, and a time to speak;
A time to love, and a time to hate,
A time for war, and a time for peace.
Ecclesiastes 3:1-8

The majority of us are experiencing a daily increase in things-to-do, while there is a seemingly steady decline in the time available to complete each task. We seem to be working faster, and harder, we start earlier and work later, and yet the morning's project list has not only not

decreased by the end of the day, it has become longer! In fact more than 200 years ago Benjamin Franklin observed; "*Dost thou love life? Then do not squander time, for that the stuff life is made of.*"



Our daily conversations and our professional dialogues are full of time references. These may include: "*Man time; time out; down time; start time; lost time; cycle time; break time; time and a half; just-in-time; up time; Pacific time; on time; overtime; value added time; travel time; and delivery time, just to mention a few.*"

In addition our language and terminology contain time based measurement or references. These would include "*Speed to market; resiliency; happy hour; sunrise and sunset; late delivery; benchmark; parking meter; miles-per-hour; turnaround; press speed & yield; schedule; and of course, weekend.*"

These constant reminders of how important time is in our life, adds to the challenge and the pressure to do better. As we are constantly reminded, we need to "*Manage Time.*" The title of this section of the manual is Time Management, but the reality is it is impossible to manage time. "*Time Management*" is not about managing or about controlling time, but rather about managing and controlling our activity, and using the passage of time, as a measurement of our efficiency and of our effectiveness.

So why is this a big deal in diecutting and converting? Making the best use of the time you have has been a universal theme since the beginning of recorded history, as the famous quotation from *Ecclesiastes* reinforces.

However, things have changed, the products and the processes are more complex, the technology and the system

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of manufacturing is faster, and the man time or man hour resources available to handle the increased volume has and is steadily decreasing.

So, what has happened?

Traditional Measurement	Time Based Measurement
✓ Cost is the metric	✓ Time is the metric
✓ Look to Financial Results	✓ Look to physical results
✓ Utilization-oriented measures	✓ Throughput-oriented measures
✓ Individual measurement	✓ Team based measurement

In many ways the basic structure and the focus of converting has remained unchanged, however, the economic environment we work in, and the market we serve has very different and constantly evolving expectations of performance. For example, while quality control and quality management has been the driving force of our industry, the focus now is on *"Speed-to-Market."* This simply states that customers want the quality and the consistency of the folding cartons and fluted containers you are producing, but they want it faster and in the shortest time possible. And of course, as they know speed in diecutting lowers the cost of manufacturing, they also want it cheaper.

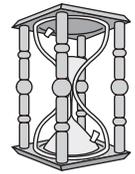
In the traditional measurement Cost was the driving force, and we constantly referred to financial measurement to assess performance. However, in the modern manufacturing operation, time is the driving force, and we look to physical results, turnaround and throughput, as the measures of performance. *See above.*

	Time is a more useful and a more accurate management tool than cost.
	Cost is normally a symptomatic, after the fact, lag indicator of productive efficiency.
	Time based companies reduce cost indirectly by compressing time.

This transformation has proved very beneficial to all manufacturing as it has forcefully demonstrated that *Time* is a more useful and a more accurate measurement tool than *Cost*. While this approach still values the importance of cost control and management, it does recognize, that the traditional cost measurement system was a symptomatic, after the fact measurement of performance. *See above.*

So, what is the bottom line?

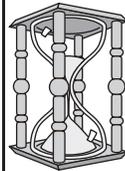
To make the transformation to *"Competing Against Time"*, we have to accept time management as the critical measurement tool, and we have to integrate time measurement into every key activity.



Time Management: Problems & Solutions

"Time is the greatest innovator..." ~Francis Bacon

The problems we face in accepting time as a primary measurement tool for assessing performance and for measuring improvement, is we have ignored this critical resource in our personal and in our business lives, and in our education and training, for too long. While everyone would agree that making the most productive use of your time, or having the time of your life, or simply having more time to do the things you want to do, is very important, we have not consistently mastered the challenge at any level of our growth.



Time management is not a difficult concept, as the majority of people are familiar with the measurement of time, and usually wear some form of wrist watch. However, we have to remember it is not time itself we are trying to manage, but we are trying to see how many tasks, activities, or actions we can accomplish in a specific length of time.

Think about the existing process? How many benchmarks are established for key activities, and how often are they upgraded? Do you measure and use Activity Time and Elapsed Time in improving performance in important procedures? Do you know what your Cycle Time is for the operation you work in? How much time does it take to install a female blanking grid? What is the average time to level the cutting impression? What is the average speed and yield of the presses in the diecutting operation? How long does it take to design and specify a steel rule die?

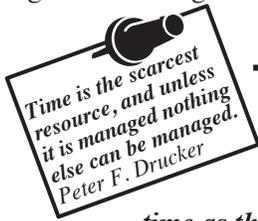


We obviously must know this information as we are quoting on customer work on a daily basis? I am certainly being sarcastic here, as our industry has only recently begun to adopt time as the critical resource it must manage against. As Rudyard Istvan noted; *"Time--rather than the cost or quality---is the overarching management objective which subsumes the others."*

Accepting the necessity of establishing and continuously upgrading benchmarks for key activity is our individual, our team, and our company challenge. How can we make this happen, and of course, as quickly as possible?

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

What is the major change in manufacturing organization we are considering? This reorganization requires accepting the following six recommendations.



→ **Accept time as the fundamental performance variable to be controlled in diecutting-converting.**

→ **Choose the consumption of time as the critical organization and management tool for all manufacturing activity.**

→ **Define all activity and tasks in terms of value-added time and non-value added time.**

→ **Implement progressive benchmarking as a key manufacturing measurement tool for every diecutting-converting activity.**

→ **Integrate the measurement of competitive response time, speed to market, and cycle time, into diecutting-converting process improvement.**

→ **Seek to provide the greatest value in the least amount of time.**

But this module is entitled *Problem*, and these seem to be recommendations? Actually, you are correct, however, to illustrate the challenges we face, it is useful to consider the opposite side of the spectrum. These six guidelines are amongst those principles and practices which drive World Class Manufacturing companies to their prominent and preeminent status.



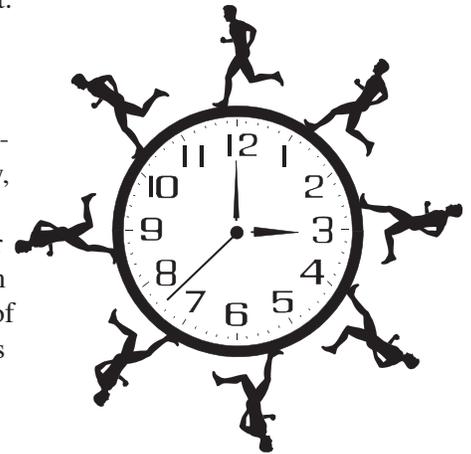
Has your organization accepted time as the fundamental performance variable; are you and your colleagues focused upon the consumption of time as a primary measurement of success; are you using standardization and progressive benchmarking to improve performance; do you measure and use the imbalance between value added and non value added time as a key analytical tool; does Cycle Time & Speed to Market factor into your weekly planning in diecutting-converting; and are you really seeking to deliver the highest value in the least amount of time?

If you consider the difference between the recommendations and the reality of your organization, the problem is clearly delineated. But what generated this failure to move with the market and with the best in the industry?

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

Time Management is like Weather Forecasting. We all complain about it, but we feel it is impossible to change. However, unlike the weather, which is out of our control, we have the ability to make our time more productive and to gradually assert control of our lives and our organizational environment.

The reason we have not focused upon time management until recently, is it was never a requirement of our work, other than in the general sense of trying to get things done as quickly as possible.



As stated earlier the discipline of time management is not about managing time, that is impossible, however, it is about managing our activity and using the passage of time to measure our efficiency. This is possible.

Unfortunately, it makes little sense to time any activity, if we execute the activity in a different and a random manner each time. To gain the benefit of time measurement it is essential to standardize the work area and to standardize all of the procedures we use to execute the activity.

This is where we struggle! Before we can even begin to manage time we need to stabilize, unify and standardize all of our key procedures; we need to stabilize, unify and standardize the work area were the activity is executed; and we need to stabilize, unify and standardize tools, supplies, and components used in the completion of the activity. ***This is where we struggle!***

Timing an activity is not difficult, measuring an activity is not difficult, but standardizing an activity is seen



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as an insurmountable obstacle to many who work in diecutting-converting.

The speed of time is one second per second.

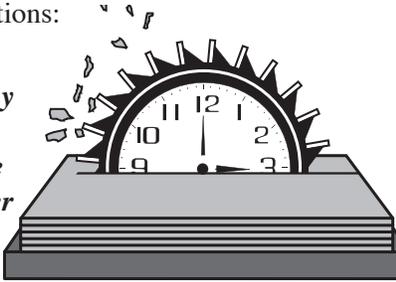
The cause of not using time management? We know it is the tip of the iceberg, and a commitment to time management means a commitment to a radical change in the way we currently do things. So how do we get started?

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

To implement an effective system of time management, designed to provide the methods and the measurement practices, to analyze and to improve the process, we have to follow a simple but essential step-by-step program. In the following sections we will discuss in more detail time based measurement systems, such as Key Result Analysis, Just-in-Time organization, and Single Minute Exchange of Die. However, time management is about activity organization, management and control, and this must be our starting point.

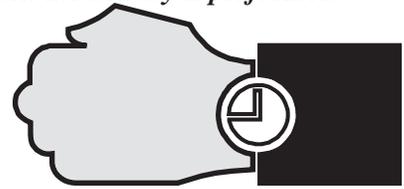
To implement this improvement initiative we need to execute the following actions:

- *The first step in any new project must be to get the entire work team together to describe the project, to outline the potential benefits of the change, to discuss the obstacles and challenges, and to brainstorm methods and practices for starting the project.*
- *It is important to list and to prioritize key activities, with the goal of choosing one activity to be the proving ground for subsequent activity reorganization and benchmarking.*
- *Although we are strictly not ready to use time management as an effective analytical tool, it would be useful to time several cycles of the selected activity, and establish an average benchmark. This will give the work teams experience in the techniques and the procedures of time measurement, and in the decisions regarding the start and end point of each activity.*



→ *The next step is accomplished by working with the project teams to stabilize and to standardize the work area, in which the activity is performed.*

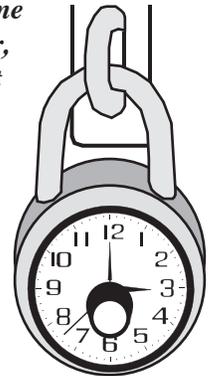
→ *This first step in standardization may require listing all of the tools, materials, equipment, supplies, information and components, which are required to complete the activity, and establishing a checklist for pre-preparation and positioning everything needed to complete the task.*



→ *The next step is to list and prioritize the sequence of procedures, which are used to complete the task under analysis. This could obviously be a single procedure or it could be a series of sequentially executed procedures.*

→ *As part of the standardization of the work area and the procedures executed in the work area, it is obviously important to define current performance measurement and/or to devise measurement based upon activity criteria and time. For example, although we can use time measurement to determine activity time and elapsed time, this would have to work in conjunction with measurements such as quality. We can time the transfer of counters, however, the most important measurement would be tool-to-tool alignment and folding performance.*

→ *The team would then execute several cycles and measure time performance, against the original standard. However, too much emphasis should not be placed upon the time, as at this stage the most important ingredient is to give individuals and teams the time to learn the new layout of the work area, and to fine tune the layout and the standardized procedures they are executing.*



→ *As the team gains experience in the use of time in terms of added value and non-added value, in terms of just-in-time organization, and in organizing the layout of the work area to minimize travel time, the benefits will accrue in faster processing and greater consistency.*

→ *To maximize the full benefit from all of these process improvement activities it is useful to use a*

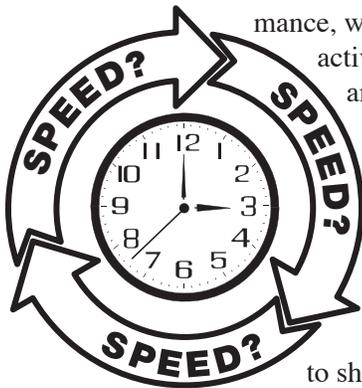
facilitator as an observer, a recorder, and as a timekeeper.

As you can see from the steps in this project, the heavy lifting is in standardizing the work area, the tools and supplies, and the procedures used to execute the activity. Time measurement or time management becomes most useful when the standardization has progressed to the stage that the use of time measurement becomes one of the important factors in selecting the most appropriate step or action in the activity.

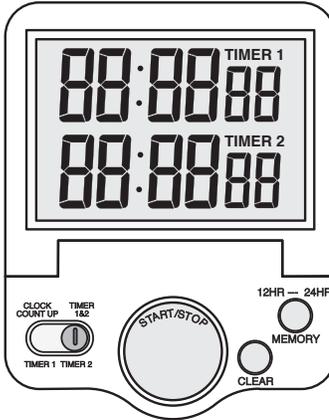
The good news is, time measurement and time control of key activities is neither complex nor difficult, however, the primary challenge, and the perennial obstacle to the faint of heart, is the need to stabilize and to standardize the activity. Time measurement will provide the feedback we need to adjust the process, but the process must be executed consistently for the use of time measurement to be effective and/or valid.

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

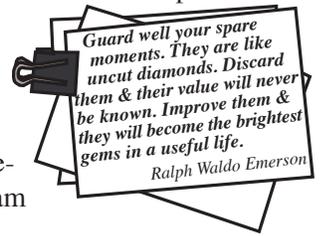
As we have described in earlier sections, one of the most powerful tools in process improvement is the standard Video Camera or Digital Camcorder. This is not only invaluable in showing the before and after, it is much easier for individuals and teams to evaluate their own performance, when they can observe the activity away from the stress and the pressure of execution.



The advantage of the modern digital camera equipment, and in fact some of the older video cameras, is they can be set to show the elapsed and activity time for the events they are recording. The modern digital media is particularly useful in this application, as the files can be downloaded to a computer to simplify access and viewing, and to allow maximum flexibility in reviewing the activity.



This both reduces the complexity of timekeeping, and it reinforces the validity of the information captured. In addition, there is no need for a professional videographer, as these cameras are simple and easy to use, and it adds great validity to the process improvement initiative if one of the team records the activity.



The Goals of Time Management

“We work not only to produce but to give value to time.” ~Eugene Delacrois

Making more effective use of time is a universal challenge, which has been a key theme of business and personal life throughout history. The recognition, that the one resource we are unable to barter or to save or to



conserve, is the most valuable, and the most volatile resource we can ever use, drives a determination to make every second count.

Manufacturing is about speed, it is about becoming the lowest cost producer, with the fastest response to customer needs. In any personal or professional environment, time is the most accurate, the simplest and the most effective way to gauge performance and measure improvement. The benefits are seemingly endless, however, the goals of time manage are:

- ➔ *To improve speed and productive output in diecutting-converting.*
- ➔ *To reduce the cost of manufacturing.*
- ➔ *To reduce turnaround and throughput.*
- ➔ *To continually reduce cycle time.*
- ➔ *To accelerate Speed to Market.*
- ➔ *To reduce the stress and the fatigue of manufacturing.*
- ➔ *To reduce the complexity of manufacturing.*
- ➔ *To implement a universal and fair system of measurement.*
- ➔ *To increase value added time and to minimize non-value added time.*
- ➔ *To benchmark the system of manufacturing.*

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The lessons inherent in setting goals for time management are as important in manufacturing as they are in our personal lives.

Time Management: Methods & Practices

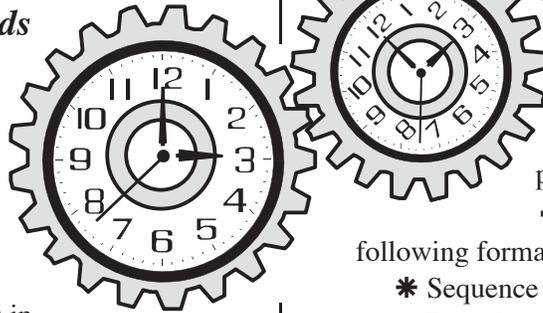
"Tomorrow is often the busiest day of the week." ~Spanish proverb

To put all of this together, and we are actually following recommendations used a number of times in earlier sections to describe how to improve safety, or skill development, through the use of a the standard operating procedure format shown at the bottom of this page.

In this application we are focused upon time management and processing efficiency, however, as stated earlier, it is vital to commit to standardization of work areas and of procedures, because in this manner we can integrate every discipline into a single format. In this section we are focused upon the recording of Activity Time and Elapsed time as key but integrated elements of every key step in each activity. This entails organizing the following activities,

- ➔ Form Two or Three Small Diecutting Improvement Teams.
- ➔ Define & Teach the Safety-Speed-Quality-Cost Mission.

➔ Divide & Prioritize the Process into Activities to be analyzed.



➔ Break the selected activity into a prioritized series of tasks or actions.

➔ Choose a Standard Operating Procedure documentation and information collection format.

➔ Divide each procedure into prioritized steps or singular actions.

➔ Process each step using the

following format:

- * Sequence & Number each Step
- * Describe the Step Action
- * Add Comments & Guidelines
- * Safety Approval & Sign Off
- * Speed Approval & Sign Off
- * Quality Approval & Sign Off
- * **Step Activity Time Record**
- * **Step Elapsed Time Record**
- * Step Cost Calculation (Activity and cumulative cost.) *See below.*

➔ Develop and benchmark each procedure and implement team approval.

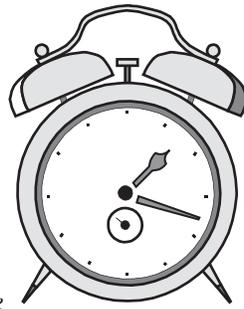
➔ Members of the Team Videotape, and time the procedure adding a voice-over.

➔ Implement the Training Map, Teaching & Certification System.

It is also necessary and an advantage to develop a checklist and questionnaire for the creation of each step in each

Standard Operating Procedure Title			PLATEN DIECUTTING: PRESS FOOTPRINTING									
SOP #:	04-05	Version #:	04.2	Department:	Pre-Press & Diecutting	Discipline:	Press Make-Ready	Page #	4.1			
Inception Date?	22-04-05	Update?	11-09-05	Approved by?	Ron Baker	Trainee?	TLK	Trainer?	RLB	Training Date?	June 05	
Step	Action	Comments	Safety	Speed	Quality	Activity Time		Elapsed Time		Cost:		
1	Position the paper, squarely on the cutting plate, aligned with the leading edge of the plate, and tape securely.	Tape corners only, of the new Press Mapping Sheet, to create a flat taught sheet.	✓ Team Alpha	✓ Team One	✓ Team Driven		03 Minutes		03 Minutes	\$75 \$75		
2	Position a sheet of carbon paper, face down on the paper, completely covering the sheet.	Use 0.005" Bar-Plate Carbon Paper	✓ Team Alpha	✓ Team Driven	✓ Team One		03 Minutes		06 Minutes	\$75 \$150		
3	Using previously recorded pressure, gradually increase press tonnage, until the knives begin marking the patch-up sheet.	Keep a Pressure Record for every setting in the footprinting sequence	✓ Team One	✓ Team One	✓ Team Driven		05 Minutes		11 Minutes	\$125 \$275		
4	Mark the Outer Impression Perimeter or Outer Layer of the first pressure level.	Use a Black Felt Marker to mark the first Pressure Layer	✓ Team Alpha	✓ Team One	✓ Team Driven		07 Minutes		18 Minutes	\$175 \$450		
5	Increase pressure slightly, record the pressure setting and take a second impression	Make a note of the pressure setting, and add the setting to the Press Mapping Sheet.	✓ Team Alpha	✓ Team Alpha	✓ Team One		02 Minutes		20 Minutes	\$50 \$500		
6	Using a different colored Marker, outline the second pressure layer.	Use a Red Felt Marker to mark the second pressure layer.	✓ Team Driven	✓ Team One	✓ Team Alpha		03 Minutes		23 Minutes	\$75 \$575		

procedure. For example the Preparatory Checklist could contain, but not be limited to, some of the following issues:



- *Where should the activity take place?*
- *What materials, tools, equipment and components are needed for task execution?*
- *How is the area properly prepared and the preparation verified for this activity?*
- *Is there a inventory management checklist used to verify the standardized location of every part, material or component in the work area?*
- *What lockout procedures are necessary for this task?*
- *Are you and your colleagues qualified and prepared for execution of this activity?*
- *How do you determine everything is ready to proceed?*
- *How many people are required for this activity?*
- *Do you have a benchmarked times standard for this activity, and what elements of the procedure are you focused upon?*
- *How are time standards being recorded and are there specific targets under attack?*
- *How does the team communicate task progress and completion?*

Remember, this is simply a more effective and logical method of organizing what we are already doing. This information plays the role of a storyboard for the creation of the Video Taped Approved Procedure by the work team. This will be used for comparing the elapsed time to an existing benchmark standard, or for creating a new time standard; for attacking Just-in-Time organization; for reviewing work area layout and value added time compared to non-value added time; and for creating simpler, faster and more effective methods of organization, training and re-training, and in benchmarking performance.

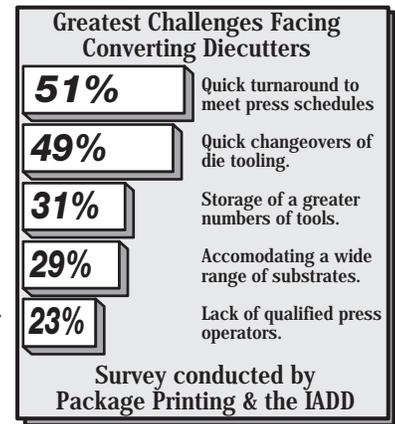


Time Management: The Benefits of Change

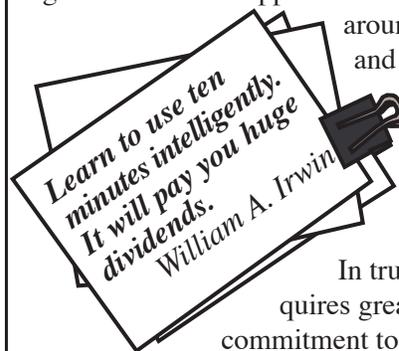
"Everything comes to him who hustles while he waits."

~Thomas Edison

The goal of implementing a time measurement system is clearly directed at improving productivity, and particularly quick turnaround and fast press changeover, to match or to exceed customer and market needs. However, the methods, the practices, and the techniques, which all come together in the benchmarking discipline, have a positive impact on every facet of work. If we examine Just-In-Time, SMED, Inventory and Information Management, and Fast Press Changeover, it is all about maximizing resource utilization and in competing against the clock.



The immediate reaction of any line worker or team member to this challenge may be to assume this requires greater effort, increased stress, and a more difficult working life. In fact the opposite is true. Focusing activity around time measurement and benchmarking actually lowers the work load, it reduces complexity, and it makes every job in diecutting much easier.

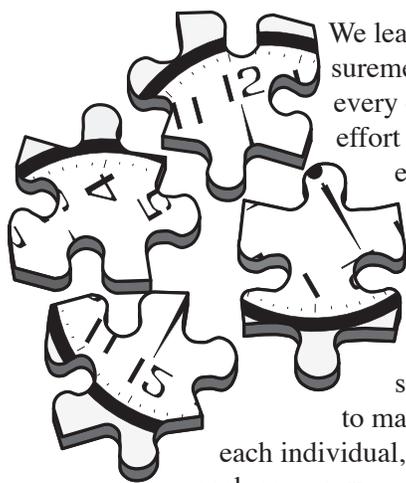
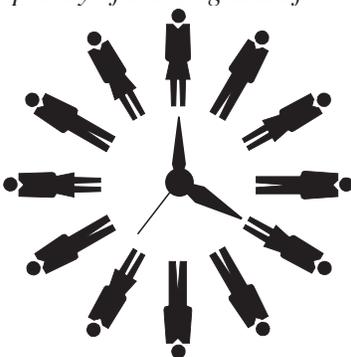


In truth, this approach requires greater discipline, and a commitment to teamwork, to building consensus, to equality in the work place, and to working together for a common goal. Simpler, faster, and better, is the by-line of time management. What are some of the benefits of this approach to diecutting manufacturing?

- *The Time Management Discipline reduces work complexity and makes every job easier.*
- *The Time Management Discipline makes task execution simpler and reduces stress and fatigue.*
- *The Time Management Discipline increases the speed of processing and reduces the effort of work.*
- *The Time Management Discipline provides a fair and an unambiguous method of process measurement and improvement.*

The ABC's of Fast Diecutting Press Changeover!

- The Time Management Discipline builds performance parity and procedural uniformity, and it greatly reduces the complexity of training and of retraining.
- The Time Management Discipline reduces the complexity and the technical challenge of diecutting-converting.
- The Time Management Discipline increases the speed, the yield and the throughput of diecutting.
- The Time Management Discipline increases job security by continually lowering operating cost and by steadily improving turnaround performance.
- The Time Management Discipline is easy to understand, it is simple to use, and it requires minimal training.
- The Time Management Discipline improves the ability to choose between competing technical and organizational options.
- The Time Management Discipline levels the playing field and increased the equality of knowledge and skill development.



We learnt to use time measurement at an early age, and every one of us has made an effort to maximize the benefit of this fundamental resource. Time management in diecutting converting is about organizing our activity using benchmark time standards as our guide, to maximize the benefit to each individual, to each team, and to each company.

As Dennis Waitely observed; *“Time is an equal opportunity employer. Each human being has exactly the same number of hours and minutes every day. Rich people can’t buy more hours. Scientists can’t invent new minutes. And you can’t save time to spend it on another day. Even so, time is amazingly fair and forgiving. No matter how much time you’ve wasted in the past, you still have an entire tomorrow. Success depends upon using it*

wisely---by planning and setting priorities.”

Time Management: Recommended Actions

“Remember that time is money.” ~Benjamin Franklin

To implement this improvement initiative we need to execute the following actions:

- The first step in any new project must be to get the entire work team together to describe the project, to outline the potential benefits of the change, to discuss the obstacles and challenges, and to brainstorm methods and practices for starting the project.

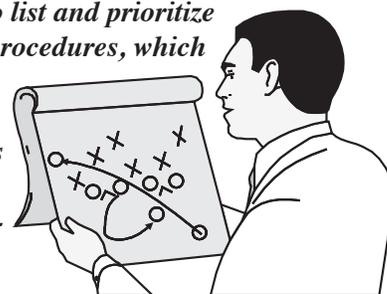


- It is important to list and to prioritize key activities, with the goal of choosing one activity to be the proving ground for subsequent activity reorganization and benchmarking.

- Although we are strictly not ready to use time management as an effective analytical tool, it would be useful to time several cycles of the selected activity, and establish an average benchmark. This will give the work teams experience in the techniques and the procedures of time measurement and in the decisions regarding the start and end point of each activity.

- The next step is accomplished by working with the project teams to stabilize and to standardize the work area, in which the activity is performed.
- This first step in standardization may require listing all of the tools, materials, equipment, supplies, information and components, which are required to complete the activity, and establishing a checklist for pre-preparation and positioning everything needed to complete the task.

- The next step is to list and prioritize the sequence of procedures, which is used to complete the task under analysis. This could obviously be a single procedure or it could



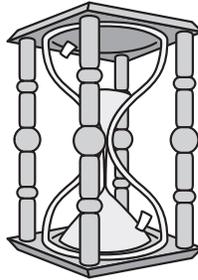
be a series of sequentially executed procedures.

→ *As part of the standardization of the work area and the procedures executed in the work area, it is obviously important to define current performance measurement and/or to devise measurement based upon activity criteria and time. For example, although we can use time measurement to determine activity time and elapsed time, this would have to work in conjunction with measurements such as quality. We can time the transfer of counters, however, the most important measurement, would be tool-to-tool alignment and folding performance.*

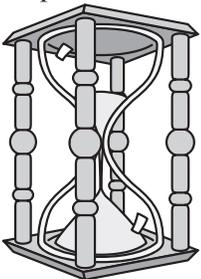
→ *The team would then execute several cycles and measure time performance, against the original standard. However, too much emphasis should not be placed upon time performance as at this stage the most important ingredient is to give individuals and teams the time to learn the new layout of the work area, and to fine tune the layout and the standardized procedures they are executing.*

→ *As the team gains experience with the use of time in terms of added value and non-added value, in terms of just-in-time organization, and in the layout of the work area to minimize travel time, the benefits will accrue in faster processing and greater consistency.*

→ *To maximize the full benefit from all of these process improvement activities it is useful to use a facilitator as an observer, a recorder, and as a timekeeper.*



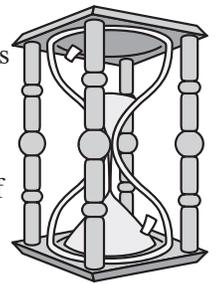
As you can see from the steps in this project, the heavy lifting is in standardizing the work area, the tools and supplies and the procedures used to execute the activity. Time measurement or time management becomes most useful when the standardization has progressed to the stage that the use of time measurement becomes one of the important factors in selecting the most appropriate step or action in the activity.



To put all of this together, we are actually following recommendations used a number of times in earlier sections to describe how to improve safety or skill development, through the use of a standard operating procedure. This method

includes a critical focus upon the recording of Activity Time and Elapsed time as key but integrated elements of every key step in each activity. This entails organizing the following activities,

- Form Two or Three Small Diecutting Improvement Teams.
- Define & Teach the Safety-Speed-Quality-Cost Mission.
- Divide & Prioritize the Process into Activities to be analyzed.
- Break the selected activity into a prioritized series of tasks or actions.
- Choose a Standard Operating Procedure documentation and information collection format.
- Divide each procedure into prioritized steps or singular actions.
- Process each step using the following format:
 - * Sequence & Number each Step
 - * Describe the Step Action
 - * Add Comments & Guidelines
 - * Safety Approval & Sign Off
 - * Speed Approval & Sign Off
 - * Quality Approval & Sign Off
 - * **Step Activity Time Record**
 - * **Step Elapsed Time Record**
 - * Step Cost Calculation (Activity and cumulative cost.)
- Develop and benchmark each procedure and implement team approval.
- Members of the Team Videotape and time the procedure adding a voice-over.
- Implement the Training Map, Teaching & Certification System.



Remember, this is simply a more effective and logical method of organizing what we are already doing. This information plays the role of a storyboard for the creation of the Video Taped Approved Procedure by the work team; for comparing the elapsed time to an existing benchmark standard, or for creating a new time standard; for attacking Just-in-Time organization; for reviewing work area layout and value added time compared to non-value added time; and for creating simpler, faster and more effective methods of organization, training and retraining, and in benchmarking performance.

Section 10:

Time Management: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ One of the few guarantees in life is the equality of time. Everyone, from the rich and famous, to the poor and the unknown foot soldier, receives an identical daily allocation of seconds, minutes and hours. The great unknown of course, is how and when this resource will become superfluous, as we are no longer here to *spend* our time. The recognition of the irreplaceable volatility of our time and our lives, adds to the stress and frustration of daily living as we try to “*manage & control*” this resource.
- ✓ These constant reminders of how important time is in our life adds to the challenge and the pressure to do better. As we are constantly reminded, we need to “*Manage Time.*” The title of this section of the manual is *Time Management*, but the reality is it is impossible to manage time. “*Time Management*” is not about managing or about controlling time, but rather about managing and controlling our activity, and using the passage of time, as a measurement of our efficiency and of our effectiveness.
- ✓ The problems we face in accepting time as a primary measurement tool for assessing performance and for measuring improvement, is we have ignored this critical resource in our personal and in our business lives, and in our education and training, for too long. While everyone would agree that making the most productive use of your time, or having the time of your life, or simply having more time to do the things you want to do, is very important. Unfortunately, we have consistently failed to meet the challenge at any level of our growth.
- ✓ Has your organization accepted time as the fundamental performance variable; are you and your colleagues focused upon the consumption of time as a primary measurement of success; are you using standardization and progressive benchmarking to improve performance; do you measure and use the imbalance between value-added and non-value added time as a key analytical tool; does Cycle Time & Speed to Market factor into your weekly planning in diecutting-converting; and are you really seeking to deliver the highest value in the least amount of time?
- ✓ Before we can even begin to manage time we need to stabilize, unify and standardize all of our key procedures; we need to stabilize, unify and standardize the work area where the activity is executed; and we need to stabilize, unify and standardize tools, supplies, and components used in the completion of the activity. ***This is where we struggle!***
- ✓ To implement an effective system of time management, designed to provide the methods & the measurement practices, to analyze & to improve the process, we have to follow a simple but essential step-by-step program. In the following sections we will discuss in more detail time based measurement systems, such as Key Result Analysis, Just-in-Time organization, and Single Minute Exchange of Die. However, it is vital to accept that time management is about activity organization, management & control, & this must be our start point.
- ✓ The goal of implementing a time measurement system is clearly directed at improving productivity, and particularly quick turnaround and fast press changeover, to match or to exceed customer and market needs. However, the methods, the practices, and the techniques, which all come together in the benchmarking discipline, have a positive impact on every facet of work. If we examine Just-In-Time, SMED, Inventory and Information Management, and Fast Press Changeover, it is all about maximizing resource utilization and in competing against the clock.
- ✓ As Dennis Waitely observed; “*Time is an equal opportunity employer. Each human being has exactly the same number of hours and minutes every day. Rich people can't buy more hours. Scientists can't invent new minutes. And you can't save time to spend it on another day. Even so, time is amazingly fair and forgiving. No matter how much time you've wasted in the past, you still have an entire tomorrow. Success depends upon using it wisely---by planning and setting priorities.*”

Section Ten:

Time Management: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ What do we mean when we use the term Time Management?
- ✓ If we are not managing time, what are we managing?
- ✓ Do you currently have and do you currently use any timing devices in diecutting and in press changeover?
- ✓ How is time management or time measurement integrated into standard operating procedures?
- ✓ What is Activity Time and what is Elapsed Time?
- ✓ How have changes in the industry made time management more important?
- ✓ Why is Time Measurement replacing Cost Measurement in manufacturing?
- ✓ Provide some examples of how you use time management in your personal and in your professional life?
- ✓ Are you currently using Video Camera Recording equipment in process improvement in diecutting converting?
- ✓ Provide two of the six principles of implementing a time management focus?
- ✓ Why do we struggle with time management and benchmarking in diecutting converting?
- ✓ What is the first step in getting the time management project underway?
- ✓ How must the work area be organized to make the use of time management effective?
- ✓ How must the tools and materials in the work area be organized to make the use of time management effective?
- ✓ How would you describe the concept of the Cycle Time Measurement?
- ✓ How would you describe the concept of the Speed to Market?
- ✓ If you were to estimate the current difference between value-added time and non-value added time in press changeover, what would you predict it would be?
- ✓ Do you currently use time and benchmark standards in any part of diecutting converting?
- ✓ How do you think your company manages to provide the customer with a cost competitive estimate, when so much of the process is not timed or benchmarked?
- ✓ Do you have and/or have you used a stop watch to record and time activities in diecutting?
- ✓ Does the work order estimate play an important role in work planning, and how is the estimate determined?

Manufacturing System of Organization

Section 11: Systems of Measurement

Key Definitions: ... the size, length, quantity, or rate of something that has been measured ... the act or process of measuring specific dimensions ... the dimension, quantity, or capacity determined by measuring... determination of the magnitude of a quantity by comparison with a standard for that quantity ... quantities frequently measured include time, length, area, volume, pressure mass, force, and energy... the choice of the instrument used should be appropriate to the desired precision of the results ...

The Measurement Mission Statement: "It is the mission of the team to apply and/or to develop Key Result Analysis measurement(s) of critical activities in diecutting, with the goal of making the information generated by the measurement systems, graphic, simple and immediately accessible and understandable to everyone involved in the diecutting process."

Systems of Measurement: An Overview

"The numbers tell you how your business is going, not why." ~Johnathen P. Siegel

In manufacturing measurement is critical to success. *The*

Measurement is one of the fundamental processes of manufacturing. It provides the data on which new theories are based and by which older theories are tested and retested.

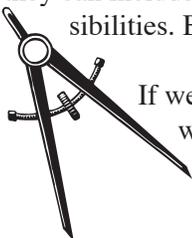
harsh reality is, if we do not measure the process, it is impossible to manage the process.

Our primary goal in diecutting and in the fast changeover project is first to

stabilize, second to standardize, and then to continually increase the speed of processing. This drive for improvement is often referred to as Faster, Cheaper, and Better. But faster than what, and what is the benchmark? And less expensive than what, and what are the cost parameters? And better than what, and how do we determine the correct degree of quality or conformance to what requirements?

All are everyday questions, which require definitive answers, and to

provide answers, we have to provide quantitative data, or a measurement of performance. These measurements can include speed, they can include time, they can include yield, they can include pressure, they can include cost, they can include quantity, they can include quality, and they can include dimensions, to mention a few of the possibilities. But everything can and must be measured.



If we fail to draw a line in the sand, how do we know where we are? How do we know if we are getting better or getting worse? And how can we determine if we are

moving in the right direction.?

The guiding principles of effective manufacturing are *Plan-Execute-Control-Evaluate*.

This is predominantly shown

as a closed loop of activity. In other words, when we are applying a systematic approach to diecutting, we gain knowledge, we gain experience and we gain data from every production cycle. This information and these performance benchmarks should then be used to modify the planning for the next cycle, so we are continually learning and continually getting better. Therefore, it is essential to measure and to quantify performance on all of the key activities, tasks and procedures in diecutting.



In the previous section we described how time measurement, while not replacing cost measurement, is however, becoming the predominant shop floor system of measurement. Time management & measurement is universally understood, it is simple to execute, it is fair and unambiguous, and it provides instant feedback to guide adjustment to current activity.

Efficiency and economy imply employment of the right instrument and the right material as well as their right use in the right manner.

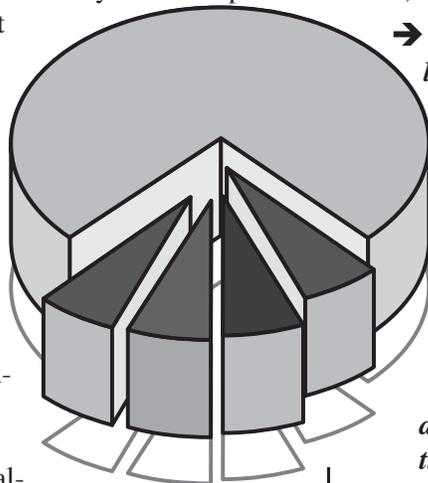
"A good measurement should be both accurate and precise. Accuracy is determined by the care taken by the person making the measurement and the condition of the instrument; a worn or broken instrument or one carelessly used may give an inaccurate result. Precision, on the other hand, is determined by the design of the instrument; the finer the graduations on the instrument's scale and the greater the ease with which they can be read, the more precise the measurement."

This focuses attention on a serious weakness in the majority of measurement systems currently in use. Most measurement systems are after the fact measurement. In other words an analysis of the information and perfor-

The ABC's of Fast Diecutting Press Changeover!

mance measures collected will be analyzed and evaluated several days after the production cycle is complete.

This provides useful data about trends and about productivity in general, but it is far too late to have any impact on the process it measured. In addition, because much of the data collected has little meaning to the diecutting team, their performance in collecting the data and taking measurements is inconsistent and often incomplete.



The Diecutting Key Result Analysis system described in this section has many advantages over current measurement systems, however, the most important advantage is it yields immediate feedback. The information collected gives immediate feedback to the operator and to the technician, and it is equally valuable at a later date to the supervisor and to the manager.



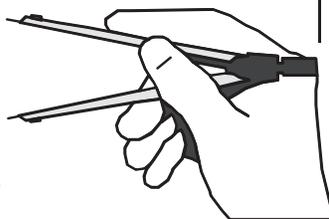
Our goal in diecutting converting is to stabilize, to standardize and to streamline the process, to make it as simple as possible, but no simpler. Using the same principles, taking comprehensive measurements of performance and collecting production and processing data should be simple and straightforward.

Systems of Measurement: Problems & Solutions

"The real contest is always between what you've done and what you're capable of doing. You measure yourself against yourself and nobody else." ~Geoffrey Gaberino

The measurement of performance in diecutting is generally ineffective, inadequate, and incomprehensible. Most of the teams collecting the data and the information have little idea what it is for, how it is used, and what impact if any, it has on their daily lives!

As measurement is critical, it is essential to implement a system of measurement which is effective, which is comprehensive, and which is easy to use and to understand. What are the problems with the current system of information/data collection and process measurement? The current state



of affairs leads to many unresolved questions by the work team, who are responsible for collecting the data.

→ *The collection of data seems to have no direct link to the technical or organizational challenges of diecutting?*

→ *The focus on costs are difficult to understand, and how is the information evaluated, because job estimates are way off the mark?*

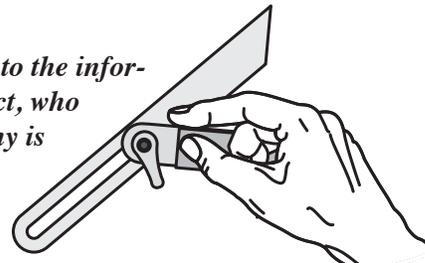
→ *It is difficult to understand the collection of data, and what it means in terms of improving performance and productivity?*

→ *As it seems to have no direct impact on diecutting, process measurement activities add time and another layer of paperwork to a job, without adding any value?*

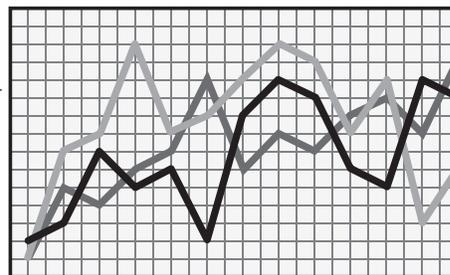
→ *How does the information collection make me better at my job, and/or is it just a way to monitor my performance?*

→ *What happens to the information I collect, who uses it, and why is there no feedback?*

→ *When we are racing against the clock to meet a critical deadline, which seems to be every day, the last thing we have time for is to collect information, which has little meaning to the immediate goals of getting the job out?*



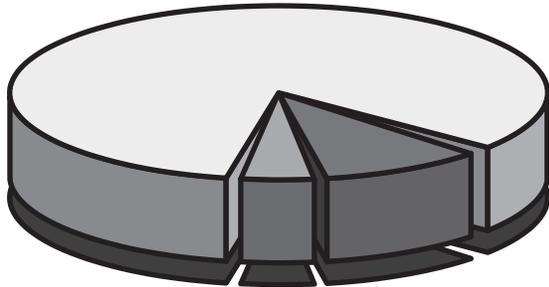
If the work teams and individuals in diecutting do not trust, or do not understand, or are not fully involved in the generation of process measurement tools, in the design of the data collection system, or in the evaluation of the data collected, the chances of a cooperative and productive focus on performance are severely inhibited. As Judith M. Bardwick noted; *"Nothing creates more self-respect among employees than being included in the process of making decisions."*



We need to develop a system of measurement which fully engages the work teams, and one which has demonstrable benefits to every individual and to every team.

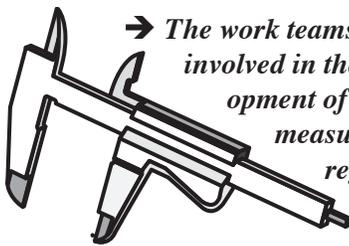
PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

Tasks have to have meaning, value or a direct and a positive impact, to gain the cooperative involvement of the work team. The most common criticism of data collection and process measurement systems, is they seem to have little connection to the work being done, they have minimal integration with performance improvement, and they are not transparent or fully explained.



Some of the more common complaints include:

- ➔ *The investment in measurement time is not focused upon key production issues, such as sheet break-up, nicking and ejection integration, or die life, etc?*
- ➔ *The current information and process measurement methods are focused on cost evaluation, and it is difficult to translate or to understand the relevance of financial data?*
- ➔ *The time consumed in these activities seems to be a non-value added activity as there is little or no feedback, and nothing seems to change as a result of the effort?*



➔ *The work teams were not and are not involved in the design and/or the development of information and process measurement practices, so it is regarded as an unnecessary complication of an already difficult job?*

- ➔ *There are no reports, meetings or discussions around the data collected, and it is difficult to remain enthusiastic about something which simply take time away from more important tasks?*

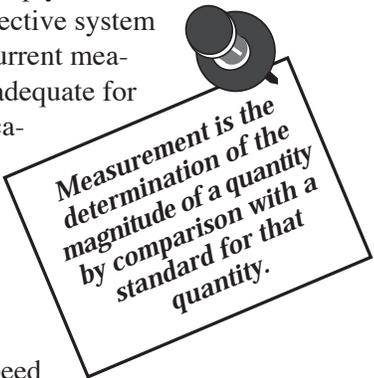
These and many similar comments illustrate the disconnect between the obvious importance of effective data collection and the application of data to simplify and

reduce the complexity of diecutting. What caused this illogical approach to manufacturing?

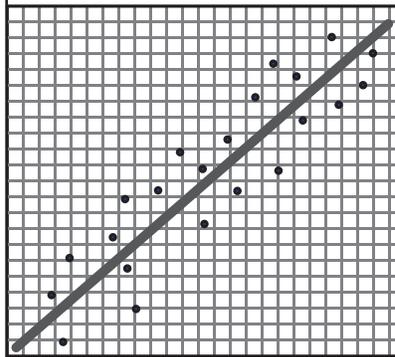
CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

The primary cause of the poor or incomplete process measurement system is simply because we have not attempted to put a more effective system in place. In the past the current measurements systems were adequate for the pace and the sophistication of the converting manufacturing process.

But with the introduction of better technology, a market place driven by speed and price, and the necessity of increasing speed to market and in maximizing throughput, we need a more effective and a more systematic approach to measuring performance.



The second cause of this stalemate is reflected in the mission statement of effective manufacturing: **Safety-Speed-Quality-Cost**. While the mission statement is still the driving force, many companies are now converting the

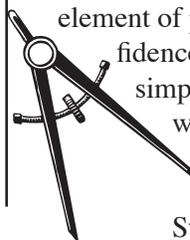


cost stage of the mission into time and cost, to more accurately reflect the commercial dynamics of diecutting converting.

The third cause of this measurement imbalance, is we have not attacked the problem of

process measurement as a team, with all of the key players taking part, and all of the different needs, views and requirements being met and/or being integrated.

The final reason many give for ignoring this essential element of process improvement is the lack of confidence in choosing an option, which would be simple, which would be effective, and which would meet every ones needs. Fortunately, this dilemma can be eliminated by the introduction of the Key Result Analysis System for Diecutting. So let us consider



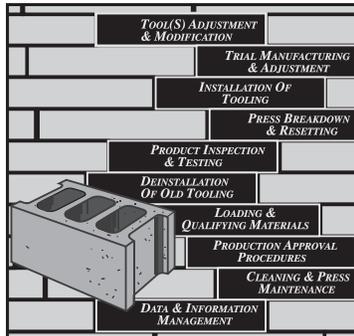
The ABC's of Fast Diecutting Press Changeover!

this option as a solution for creating an effective system of measurement.

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

One very effective option is to implement the Key Result Analysis system. *What is Key Result Analysis and why is it effective in the diecutting converting operation?*

There are several reasons why this basic statistical data collection system is the best choice for diecutting. These would include:-



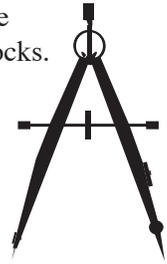
- ➔ *Key Result Analysis is a graphic method of measurement, which is simple to execute and easy to understand.*
- ➔ *Key Result Analysis is based upon Pareto Statistical Analysis.*
- ➔ *Key Result Analysis is effective because it provides immediate feedback and it is transparent to anyone viewing the information.*
- ➔ *Key Result Analysis is a simple method of data collection, however, it is one which provides sophisticated and powerful feedback.*
- ➔ *Key Result Analysis has the flexibility to adapt to several types of measurement in diecutting converting.*

How do we implement this system of measurement?

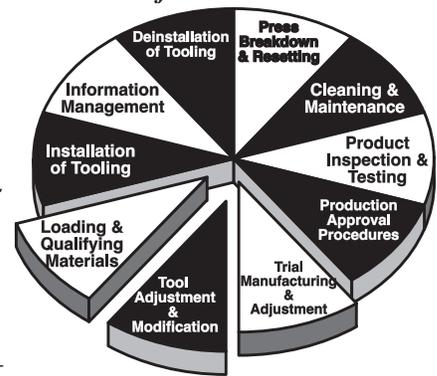
The best way to explain Key Result Analysis is to complete a step-by-step analysis of the application of this technique to Press Changeover and to Press Production.

This manual is directed at improving changeover performance, therefore, this is a great place to begin. However, we start with a question? *What is Press Changeover or Press Make-Ready?* This is an important question because the roots of our difficulty in managing and improving press make-ready is our habit of describing it as a single discipline. In fact press

make-ready or changeover is made up of the integration of ten disciplines or building blocks. See below left. These are:



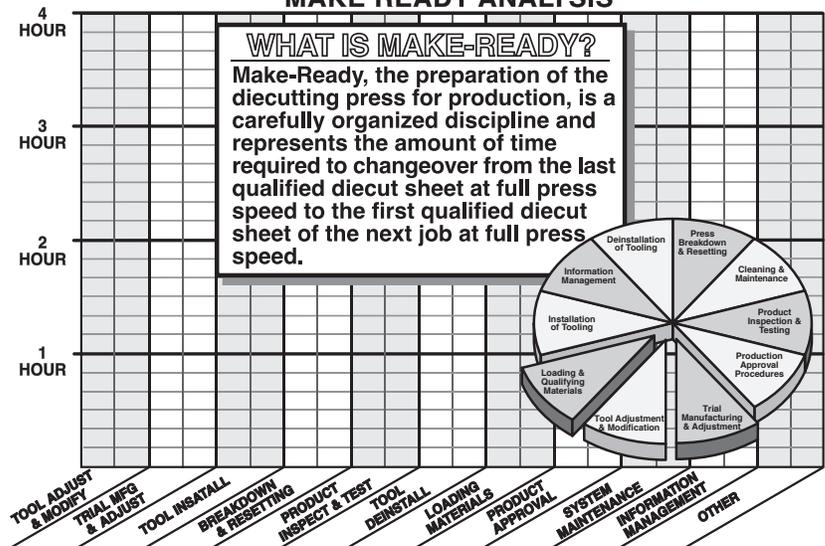
- ★ *Data & Information Management*
- ★ *Deinstallation of Old Tooling*
- ★ *Loading & Qualifying Materials*
- ★ *Press Breakdown & Resetting*
- ★ *Press Cleaning & Maintenance*
- ★ *Installation of Tooling*
- ★ *Trial Manufacturing & Adjustment*
- ★ *Tool(s) Adjustment & Modification*
- ★ *Product Inspection & Testing*
- ★ *Production Approval Procedures*



Understanding the breakdown of make ready is a great starting point in improving the process. But the next obvious question is, how is time allocated to these disciplines? They are obviously not evenly balanced, *see above*, but reflect the complexity of each discipline. So how can we reveal the breakdown of time in press make-ready?

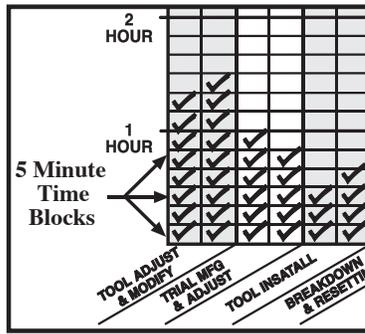
The KRA tool shown below is the vehicle we will use to complete this first stage of analysis. The structure of the data collection tool is broken into 11 vertical columns,

MAKE READY ANALYSIS



which reflect the previously named 10 disciplines, plus the option of "Other" or "Miscellaneous" to capture any unusual and unplanned activity.

The diagram to the right shows the basic structure of the form. Each column is broken vertically into 4 x 1 hour blocks, and each 1 hour block is divided into 12 x 5 minute cells. Using an observer to monitor a number of make-ready cycles, the timekeeper simply adds a check mark to each 5 minute cell in the appropriate column as the activity is taking place and as the time is accumulating.

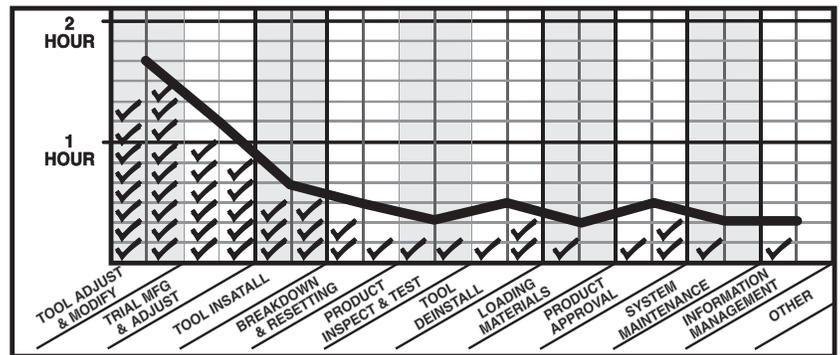


To implement this first level analysis of press make-ready, figuring out how and where time is consumed during the activity, a minimum of 5 cycles should be sufficient. However, the form shown at the bottom of the column to the left, is designed to capture 12 press changeover cycles. This layout has the advantage of being able to compare the average make-ready time, and/or to focus individually and collectively on each of the ten individual disciplines of make-ready.

To summarize the use of this first stage of make-ready analysis, the analysis of a number of press changeover cycles will eventually show a breakdown of time consumption for the various activities of make-ready. *See below.* As you can see from the Pareto statistical breakdown

There are two important pointers here. I do not believe it is necessary to institutionalize one specific focus on one measurement. It is more effective to implement a measurement initiative to reflect the focus of the work team as they are attempting to analyze, measure and improve a specific activity in make ready. In practice there is always some form of measurement taking place, but using a statistical approach, it is rarely necessary to monitor more than 5 to 15 cycles of any activity.

The second point is the advantage of using one of the work team as an observer and as a timekeeper, in this specific example of measurement. In some of the examples provided this is not necessary as the press operator can easily accomplish many measurement duties.



of time from several press changeover cycles the analysis is showing that the majority of time is expended in **Tool Adjustment & Modification.**

This simply means work done on any one of the various tools, from the patch-up sheet, to the steel rule die and counters, to the male and female stripping tools, to the male and female blanking grids, and the bottom pin tool. This could include fine tuning to the alignment to the press centerline, or to the adjustment of the Z-Axis male and female registration of each tool to each other. Also to the synchronization of one tool set to the next, as each tool set is installed and aligned on the press. This would certainly also include repairs, modifications, or changes to the tool, as part of the make-ready process.

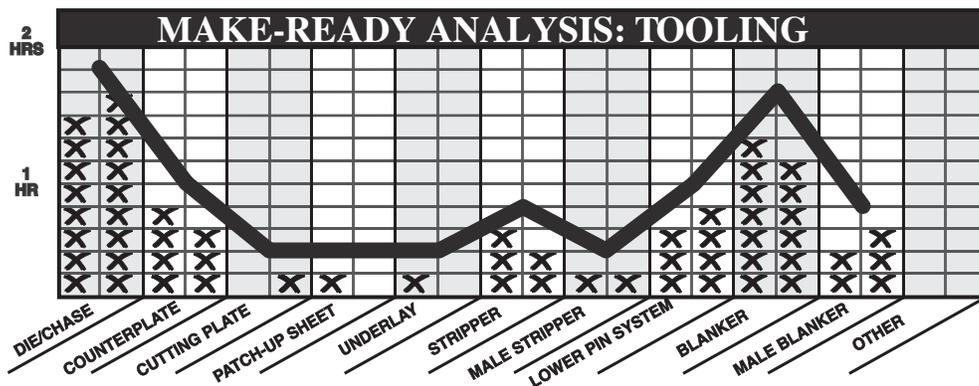
As we will learn later in the Single Minute Exchange of Die discipline, all of these re-adjustments, repairs and modifications are generally capable of being anticipated, and eliminated in the preparatory phase of diecutting. In SMED this is called converting Internal or on-press activity to External or off-press activity.

To summarize where we are, we have identified the



CHANGEOVER KEY RESULT ANALYSIS SYSTEM											
Job Number	03	03	03	03	03	03	03	03	03	03	Average Time =
Tool(s) Adjustment & Modification											00:00'
Trial Manufacturing & Adjustment											00:00'
Installation of Tooling											00:00'
Press Breakdown & Resetting											00:00'
Product Inspection & Testing											00:00'
Deinstallation of old Tooling											00:00'
Loading & Qualifying Materials											00:00'
Production Approval Procedures											00:00'
Cleaning & Press Maintenance											00:00'
Data & Information Management											00:00'
Press Make-Ready: Average Time = 00:00'											

The ABC's of Fast Diecutting Press Changeover!



10 disciplines of make-ready, and we have completed an initial Pareto analysis of the process, which demonstrates that tool adjustment and tool modification is the largest consumption of time during make-ready. This is a good start, but where do we go from here?

As before we need to narrow the focus and analyze the tool adjustment and modification discipline, to determine where time is being consumed. Using a similar format we create a analysis grid with each column representing each tool used on press. These include the die/chase, the counterplate, the cutting plate, the patch-up sheet, the underlay, the female stripping tools, the male stripping tools, the bottom pin or lower pin system, the female blanker, and the male blanking tool.

As before each vertical column is divided into 4 hour divisions, (only two hours are shown in the illustrations), and each 1 hour division is divided into 12 cells each denoting five minutes of time. As before the timekeeper records the make ready activity, but concentrates on the installation and the modification of tools, and adds a mark to each cell representing the time consumed in working on that tool.

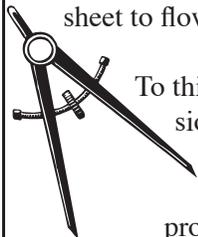
As you can see from the analysis at the top of the page, the greatest consumption of time was expended in working on the steel rule die. As we did earlier in the analysis we have made progress, however, the information we

have is not detailed enough to take remedial action, and therefore, we need to conduct another level of analysis.

Therefore, the next stage of analysis is to focus entirely on the performance of the steel rule die. This involves breaking the steel rule die on-press usage discipline into 20 separate areas of analysis. As you can see from

the bottom of the page, the vertical columns include damaged knives, broken miters, loose rules, worn knives, broken bridges, etc. Where did we get these categories from? Actually, from conducting these analytical techniques, we also identify each type of press stoppage caused by each different tool failure.

As the earlier forms each vertical column is divided into five minute cells and the timekeeper, only focusses on work on the steel rule die for a number of make-ready cycles, which demonstrate the greatest consumption of time is in nicking, and/or in adjusting nicks to get the sheet to flow through the press without breaking-up.

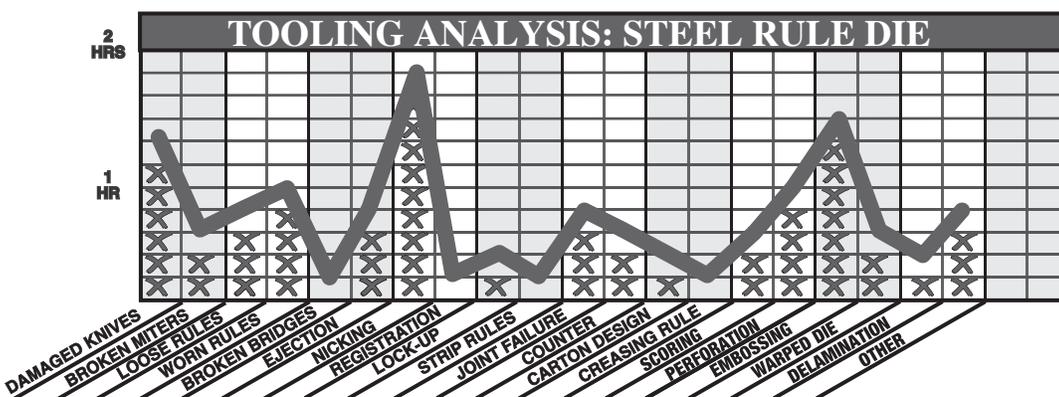


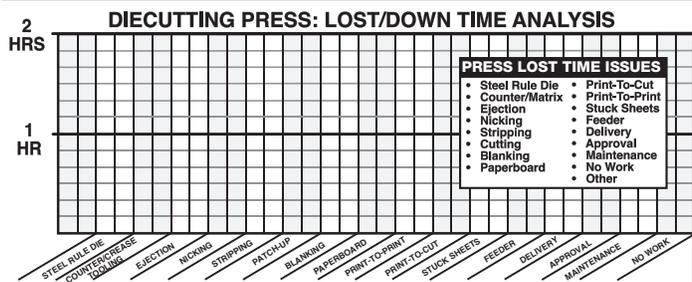
To this date we have used three different versions of the Key Result Analysis forms, and after 15 to 20 make-ready cycles we have learnt a great deal about the changeover process, and we have zeroed in on Nicking as the key problem to be analyzed and addressed.

If you are completing two press changeovers per day, which is obviously a low number, in less than two weeks we have completed a detailed analysis of the make-ready discipline. In addition, as you can see execution is simple and straightforward, and the information generated is clear, accurate and unambiguous.

After each make-ready is complete; the real test of the

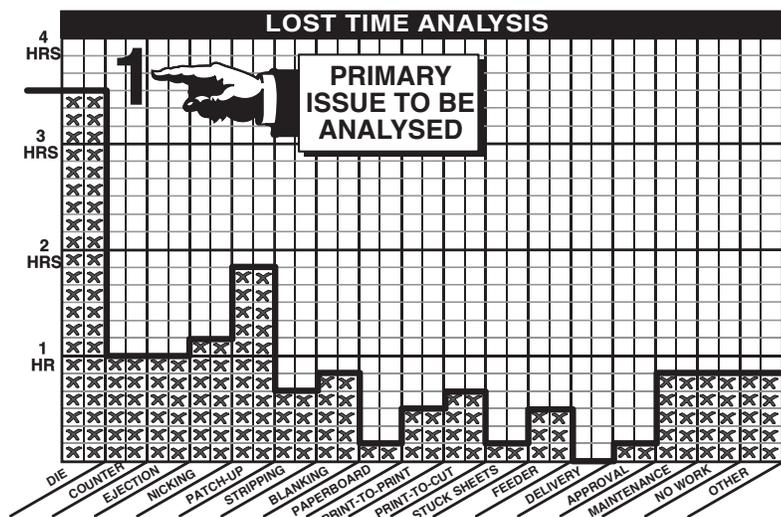
effectiveness of the changeover begins. Diecutting production presents its own series of technical and performance challenges, and just as we need to understand what is happening in changeover, and how we can fix the problem, we need similar data from press production.





Most professionals would agree that there are three things that happen on-press. *These are Make-Ready, Production, and Down Time or Lost Time.* If we are to control and to manage this process it is important to understand what is happening, so that we can focus our knowledge and skill on the problem. But first we have to identify the problem!

The Key Result Analysis chart for Lost Time or Down Time Analysis is show at the top of the page. The individ-



ual columns in this chart show the steel rule die, counter and crease tooling, ejection, nicking, and stripping, etc, as some of the potential down time problems. Naturally, as you use this type of chart you can customize the lost time categories to reflect your specific type of work, and/or you can use the production run itself to identify the lost time issues. The chart above shows the typical feedback you may encounter.

The chart is recorded by the timekeeper or the press operator as before, and the greatest number of problems occur in the steel rule die, which would naturally lead to the creation of another chart to analyze and investigate the causes of steel rule die lost time. To make the chart as easy as possible to use, it should be adhered to the face of the press with a pen or pencil attached on a chain. Then all the press operator has to do is to add a check mark in

each 5 minute cell to indicate the specific type of down time fault experienced.

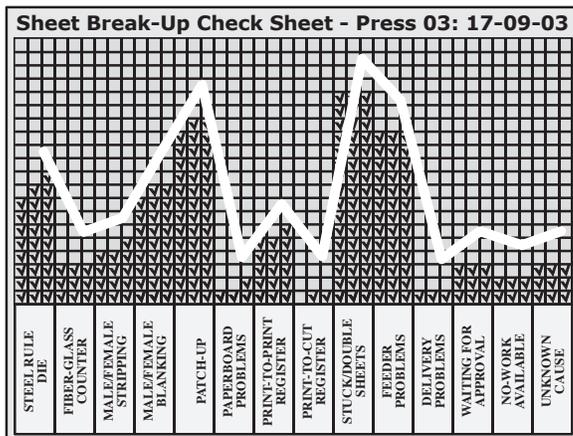
One of the perennial problems of running a sheet fed platen diecutting press at high speed is lost time caused by sheet break-up. This is a time consuming problem as each break up is both a waste of time and a waste of value-added material. Operators often feel they have a good handle on how frequently this happens, and where in the press the break-up occurs. However, prolonged statistical studies have demonstrated even experienced press operators are surprised by how

frequently sheet break-up happens, and where it happens. Therefore, we should not make assumptions or take anything for granted.

The tool used to capture and analyze sheet break-up failure is the check sheet. *See above.* The potential causes of sheet break-up are listed to the left of the chart and may include sheet break-up stemming from the action of the steel rule die, the fiberglass counter or the Matrix crease tools, and feeder problems and delivery problems. To the right of each category of stoppage is a number of cells in which the operator will make a single check mark to indicate a single incident.

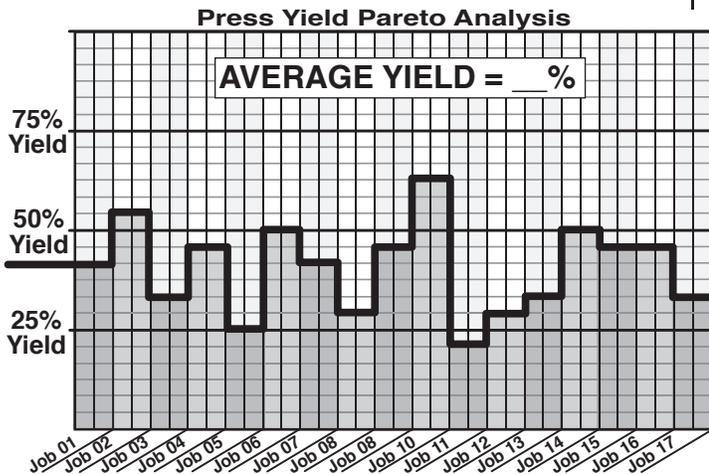
At the end of the production run the chart is rotated and the high points of each category of incident linked. *See below.* This is a very simple but a very effective tool as it immediately provides an indication of the source of the problem, with great clarity.

STEEL RULE DIE	
FIBER-GLASS COUNTER	
MALE/FEMALE STRIPPING	
MALE/FEMALE BLANKING	
PATCH-UP	
PAPERBOARD PROBLEMS	
PRINT-TO-PRINT REGISTER	
PRINT-TO-CUT REGISTER	
STUCK/DOUBLE SHEETS	
FEEDER PROBLEMS	
DELIVERY PROBLEMS	
WAITING FOR APPROVAL	
NO-WORK AVAILABLE	
UNKNOWN CAUSE	

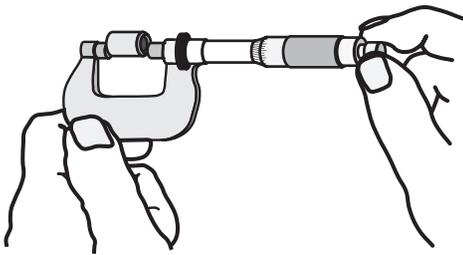


The ABC's of Fast Diecutting Press Changeover!

Another critically important tool in diecutting press production is to collect information about and to focus every ones attention on the importance of press yield. While we



discuss and focus disproportionately on press speed; the real measurement of productivity is production yield. In the Key Result Analysis chart *above*, we have adapted the format we have used previously by designating each 5 minute cell as representing either 100 sheets or 150 sheets or 250 sheets, or whatever the average hourly production output is. Although we talk about press speed, the sad truth in our industry, is the average press yield is less than 50%!



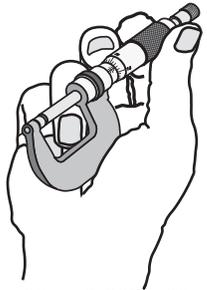
As you can see from these examples, the Key Result Analysis approach to process measurement is

endlessly flexible, it is simple and straightforward to use, and the stark graphic display of whatever performance is being measured makes it easy for anyone to understand, but most importantly, it makes the information difficult to ignore.

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

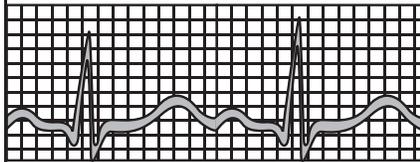
As you can see from the simplicity of this approach to process measurement, training time and data collection competence are a matter of hours and not several days. However, even with the ease of use and the power of the graphic display of performance, many work teams will find any number of excuses to avoid taking responsibility for this innovation. After all, why shine the brightest

spotlight on their own performance? Realistically, every effective process improvement initiative in any program requires and demands a system of measurement to determine status, and to determine a fall off in performance or a positive improvement.

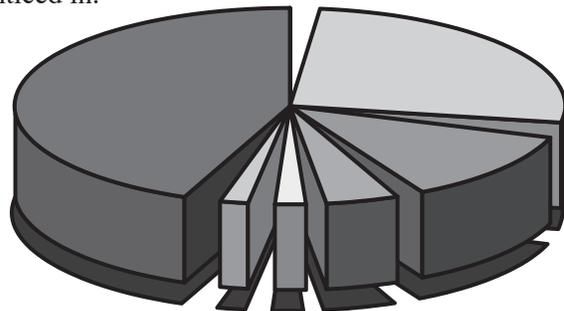


However, as this is a simple system to use, we can use the least experienced team members to complete all of the required measurements for the first month of execution. In fact, the system is so simple, anyone can be trained in a few hours and it has proven effective in a number of companies to recruit people from other departments within the organization to complete the measurement tasks they are assigned.

This provides several benefits. It enables the press team to focus on the task at hand, while the measurement can take place simultaneously; it enables the system to be established and the transparent power of

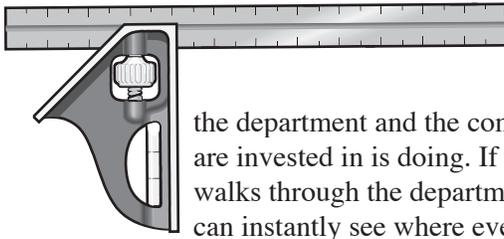


the information to be displayed without interfering with the press changeover discipline; it gives the press teams time to observe the process and to recognize how simple and how beneficial the Key Result Analysis system is; it ensures we start using the system and begin to gain the insights in how to improve quality and productivity; it establishes basic benchmarks critical to stabilization and to process improvement; and when we use a new recruit or a trainee, it provides this timekeeper with an excellent foundation of knowledge about the process they are apprenticed in.



The second major innovation is to install notice boards beside each press in the toolmaking department and in the pre-press department, to remind everyone of the importance of teamwork and a common focus on problems, and to make the measurement system transparent and open to everyone involved in the organization.

If the maintenance personnel walk through the depart-



ment, they can see instantly how

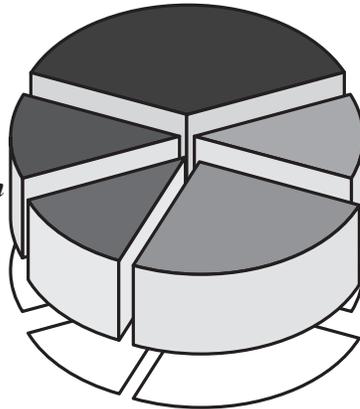
the department and the company they are invested in is doing. If the supervisor walks through the department he or she can instantly see where everyone is and

how key projects are progressing without the necessity of holding time consuming meetings. If the President of the company walks through the department, even though he or she may not have the technical knowledge to really appreciate the complexities of diecutting, every Key Result Analysis chart will provide immediate, clear, and up-to-date information about the productive state of the department and the work teams.

The Goals of Systems of Measurement

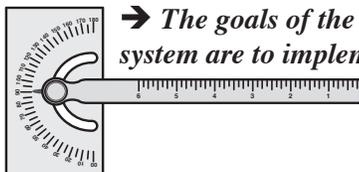
“There are two possible outcomes: if the result confirms the hypothesis, then you’ve made a measurement. If the result is contrary to the hypothesis, then you’ve made a discovery.”

~Enrico Fermi

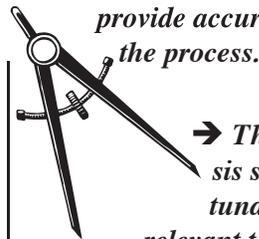


An effective system of measurement is so important to process improvement, the goals cross functional boundaries and lines of demarcation, to unify all of the work teams involved in diecutting. However, a short list of the goals of the Key Result Analysis system would include:

- ➔ *The goals of the Key Result Analysis system are to implement a universal, a flexible, and a simple method of establishing benchmark standards and of providing an accurate method of evaluating progressive change.*
- ➔ *The goals of the Key Result Analysis system are to implement a method of measurement which is not complex, which is easy to understand, and which is instantly accessible to all the members of the organization.*



➔ *The goals of the Key Result Analysis system are to implement a portfolio of adaptable measurement tools which record activity in real time, and which*



provide accurate feedback to match the speed of the process.

➔ *The goals of the Key Result Analysis system are to implement a series of tunable measurement options which are relevant to, and are an immediate benefit to the work teams.*

➔ *The goals of the Key Result Analysis system are to implement a reliable and acceptable system of process measurement, which is fast to assimilate and not difficult to master, for all of the work team members.*

The primary goal of any measurement system is there should be no mystery about what it is measuring and how it works, and it is important it is capable of demonstrating immediate benefits to the teams and individuals using the system.

Systems of Measurement: Methods & Practices

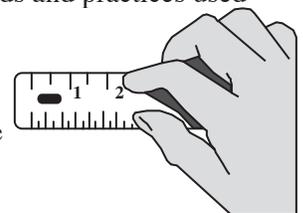
“Any measurement must take into account the position of the observer. There is no such thing as measurement absolute, there is only measurement relative.” ~Jeanette Winterson

Because the Key Result Analysis system is incredibly simple, developing acceptable methods and practices for the entire work team should not be difficult. But realistically, measurement systems are inherently controversial,

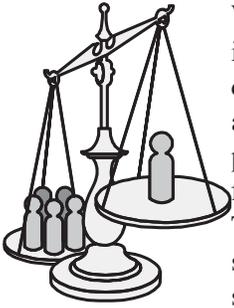


and in most operations there is deep scar tissue associated with failed data collection systems, or the collection of data, which was used as means of what was perceived as unfair classification or a biased individual review.

In most situations this perception is misplaced, however, war stories associated with these types of initiatives remain a potent obstacle to full and fast acceptance. Therefore, in terms of the methods and practices used to implement the Key Result Analysis, system they are relatively simple, as the system can be endlessly adapted to a diverse range of manufacturing applications.



The ABC's of Fast Diecutting Press Changeover!



Where the time must be invested in team meetings in which this document is read, reviewed and brainstormed, until the key players have taken ownership for the system of measurement. The starting points are obvious; stabilizing, standardizing and simplifying press make-ready;

but the method used must reflect a consensus, however slowly this evolves.

This system can be used in many ways to reflect the specific needs of each application, but it can only be effective if everyone accepts the measurement system as a cornerstone of their daily duties and responsibilities.

Take your time presenting and discussing how to begin the Key Result Analysis system, and the resulting implementation will be fast, effective, and seamless.

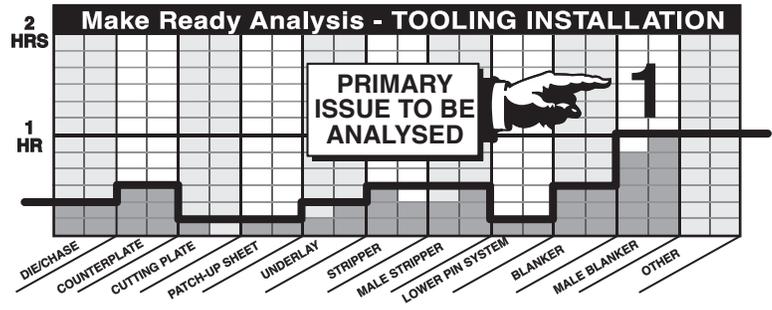
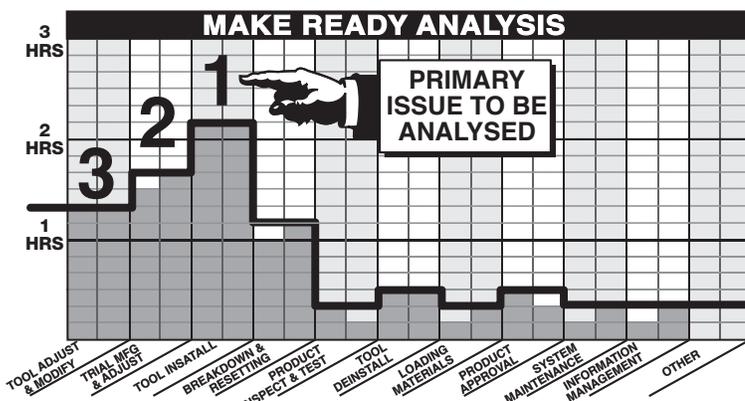
Systems of Measurement: The Benefits of Change

"A decentralized company is much more in need of good measurement methods than is a hierarchical, centralized organization. ...in a decentralized organization, employees at all levels must understand exactly what the target is and how best to achieve it" ~Jan Carlzon



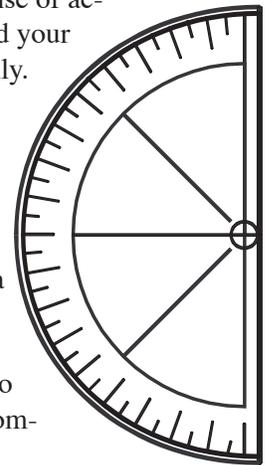
As a Diecutting Master craft Professional, I wish I had known about these tools and techniques earlier in my career. For the moment let us forget everyone else involved in the process.

If you, as a professional use these measurement tools, your knowledge, your skill, your experience, your value, and your job security will increase significantly.



If you, as an individual crafts man or women use these measurement tools, the degree of effort you have to expend to complete every task will be continually reduced; the degree of stress and frustration, which is inherent to an aggressive and challenging process, will steadily decline; your fatigue and the potential for accidents and injury will be lowered; and your sense of accomplishment, your self esteem, and your confidence, will increase dramatically.

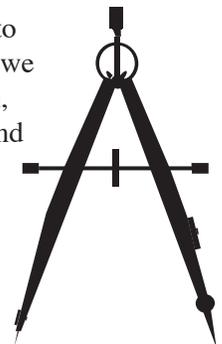
You may feel this is an exaggeration, but when you consider all of the ideas and concepts I have put together in this manual, culled from my experience as a diemaking and a diecutting craft professional, I will stake my reputation on the power of the Key Result Analysis system to make you faster, better, and more competent at what you do.



The benefits to the organization, will of course be a function of your ability to maximize the use of this measurement system to become a world class diecutting-converting professional.

You know this is not a difficult challenge, and you know you can master these techniques and improve upon the foundation I have described with relative ease. To make it work however, you have to commit to making this type of measurement system a key attribute in your portfolio of skill and ability as a craft professional.

The choice is yours, but if we are to safeguard our jobs and our future, we have to get better as fast as we can, we have to commit to teamwork and teambuilding, and we must accept that process measurement is an important tool in this growing competitive struggle.



Systems of Measurement:

Recommended Actions

"It costs five times more to get out and get a new customer than it does to maintain a customer you already have." ~Tom Peters

One of the interesting changes in this section of the manual, *Systems of Measurement*, is there are few clearly delineated suggestions for how to choose the most effective *Methods & Practices*, nor is there provision of a long step-by-step list of *Recommended Actions*. In many ways this may seem surprising, because as I hope you have discovered by now, this is one of the most important sections in the entire workbook. In practice, all of the sections are solid building blocks required to achieve and to sustain Fast Press Changeover, however, without a comprehensive system of measurement it is difficult and it is impossible to start, to control or to manage progress.

ACTION LIST	Individual Priority
A : Press Set-Up	
B : Tooling Installation	
C : Information Management	
D : Product Inspection	
E : Tooling Adjustment	
F : Cleaning & Maintenance	
G : Loading Materials	
H : Trial Manufacturing	
I : Product Approval	
J : Tooling Deinstallation	

My recommended actions are simple and straightforward. Use your common sense!

I am sure you can see from reading the preceding pages, that although the Key Result Analysis system is a powerful and flexible measurement tool, it is very, very simple. Training is minimal, implementation is not complex, assessment is graphically obvious, and the results of a consistent approach will provide signposts and clear directions leading you to the specific technical and performance problems to be resolved.

So what are the recommended actions?

To be effective these measurement tools require your commitment to the process and your willingness to be open minded and positive about the results. Inherent to the data collection process is the inevitable revelation and

ACTION LIST	Individual Priority
A : Press Set-Up	7
B : Tooling Installation	8
C : Information Management	1
D : Product Inspection	6
E : Tooling Adjustment	10
F : Cleaning & Maintenance	2
G : Loading Materials	3
H : Trial Manufacturing	9
I : Product Approval	4
J : Tooling Deinstallation	5

exposure of methods and practices, which are either outdated, ineffective, or are simply incorrect. It is vital to neither take this as a personal slight

NOMINAL GROUP VOTING

In a new team there is often the danger of dominance by one or more individuals. To prevent the selection of issues being unrepresentative of the entire team, we need a balanced method of selecting between competing alternatives.

If there were ten problems or ten potential solutions to be evaluated, the first step is to allocate a letter of the alphabet, from A to J, and give each team member a card on which to allocate their preference and priority.

This system of allocating priorities requires each team member to make his or her selection by writing a 10 next to their top priority, 9 next to their second priority, and so on, until all the items are prioritized.

The votes are then tallied, either secretly, by a facilitator, or by a show of hands.

or use it to embarrass other members of the work team.

Therefore, the most effective approach is to copy and circulate this section of the manual to everyone involved, and ask them to read and review the section, and while positive skepticism is a productive thought process, having a closed mind, is not.

Once everyone has had

time to read the information, it is important to schedule a series of meetings, with the goal of taking this information, adding it to the groups personal experience, and customizing the Key Result Analysis to reflect your specific needs and your specify priorities. I recommend a number of meetings, as it is a good idea to give team members time to digest and to think though the proposed changes to the system of manufacturing.

Then plan and schedule implementation, start slowly, and make sure everyone is involved or consulted in the

ACTION LIST	VOTING					Totals	TEAM Priority
A : Press Set-Up	7	7	8	7	6	35	4
B : Tooling Installation	8	10	6	8	9	41	3
C : Information Management	2	4	5	6	7	24	6
D : Product Inspection	6	5	3	3	5	22	7
E : Tooling Adjustment	10	9	10	9	10	48	1
F : Cleaning & Maintenance	2	2	2	2	2	10	9
G : Loading Materials	3	1	1	1	1	7	10
H : Trial Manufacturing	9	8	9	10	9	44	2
I : Product Approval	4	6	7	4	4	25	5
J : Tooling Deinstallation	5	3	4	5	3	20	8

development of your own Key Result Analysis measurement system

You will have noticed on this page there are a number of text blocks and graphics illustration, what is often called the Nominal Group Voting Technique. This is simply an effective manner to decide between competing proposals and potential options, when working with groups of people.

It may not be necessary for you and your colleagues, but it is a proven, a fair, and a less controversial way to choose between different options.

Section Eleven:

Systems of Measurement: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ In manufacturing measurement is critical to success. ***The harsh reality is, if we do not measure the process, it is impossible to manage the process.***
- ✓ All our everyday questions which require definitive answers, and to provide answers, we have to provide quantitative data, or a measurement of performance. These measurements can include speed, they can include time, they can include yield, they can include pressure, they can include cost, they can include quantity, they can include quality, and they can include dimensions, to mention a few of the possibilities. But everything can and must be measured.
- ✓ The guiding principles of effective manufacturing are ***Plan-Execute-Control-Evaluate***. This is predominantly shown as a closed loop of activity. In other words, if we are applying a systematic approach to diecutting, we gain knowledge, we gain experience and we gain data from every production cycle, and this information and these performance benchmarks must be used to modify the planning for the next cycle, so we are continually learning and continually getting better. Therefore, it is essential to measure and to quantify performance on all of the key activities, tasks and procedures in diecutting.
- ✓ Our goal in diecutting converting is to stabilize, to standardize and to streamline the process, to make it as simple as possible, but no simpler. Using the same principles, taking comprehensive measurements of performance and collecting production and processing data, should be simple and straightforward.
- ✓ If the work teams and individuals in diecutting do not trust, or do not understand, or are not fully involved in the generation of process measurement

tools, in the design of the data collection system, or in the evaluation of the data collected, the chances of a cooperative and productive focus on performance are severely inhibited.

- ✓ The primary cause of the poor or incomplete process measurement system is simply because we have not attempted to put a more effective system in place. In the past, the current measurements systems were adequate for the pace and the sophistication of the converting manufacturing process. But with the introduction of better technology, a market place driven by speed and price, and the necessity of increasing speed to market and in maximizing throughput we need a more effective and a more systematic approach to measuring performance.
- ✓ One very effective option is to implement the Key Result Analysis system. What is Key Result Analysis and why is it effective in the diecutting converting operation? There are several reasons why this basic statistical data collection system is the best choice for diecutting. These would include:-
 - ➔ ***Key Result Analysis is a graphic method of measurement, which is simple to execute and easy to understand.***
 - ➔ ***Key Result Analysis is based upon Pareto Statistical Analysis.***
 - ➔ ***Key Result Analysis is effective because it provides immediate feedback and it is transparent to anyone viewing the information.***
 - ➔ ***Key Result Analysis is a simple method of data collection, however, it is one which provides sophisticated and powerful feedback.***
 - ➔ ***Key Result Analysis has the flexibility to adapt to several types of measurement in diecutting converting.***
- ✓ An effective system of measurement is so important to process improvement, the goals cross functional boundaries, and lines of demarcation to unify all of the work teams involved in diecutting.

Section Eleven:

Systems of Measurement: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Why is process measurement important in diecutting and in all of the functions supporting the diecutting operation?
- ✓ Why is process measurement so critical to establishing and improving benchmark standards?
- ✓ How do you think we can improve the process, without a measurement system?
- ✓ What is the four step guiding principle of effective diecutting manufacturing?
- ✓ Why are after the fact measurement & data collection systems not very effective in diecutting?
- ✓ What is the Diecutting Key Result Analysis System?
- ✓ What is the statistical system this approach to measurement is based upon?
- ✓ Why is a focus on cost measurement less effective than a focus on time measurement for the professional diecutter?
- ✓ Describe the measurement systems currently in use, and their impact upon the work you do?
- ✓ Why is the graphical approach to process measurement such a benefit in the Key Result Analysis system?
- ✓ What are the 10 discipline of platen diecutting make-ready?
- ✓ How are the vertical columns in the Key Result Analysis charts broken down?
- ✓ What are the recommended number of production cycles to reliably collect accurate data?
- ✓ Why do you think the use of a timekeeper is recommended ?
- ✓ What are the three types of activity, which happen on-press in every complete production cycle?
- ✓ What is a Check Sheet and how is it used to monitor and record sheet break-up?
- ✓ Why is Press Yield such an important measurement in assessing diecutting performance?
- ✓ Name two of the goals of implementing the Key Result Analysis system?
- ✓ What is the Nominal Group Voting Technique?

Manufacturing System of Organization

Section 12: Just-In-Time Organization

Key Definitions: ... a manufacturing strategy wherein parts are produced or delivered or positioned, only in the quantity needed, when they are needed, and where they are needed ... a strategy in which parts are delivered as quickly, as simply and as precisely as possible ... a strategy which modifies and customizes work areas and practices to minimize resource waste...

The Just-In-Time Mission Statement: "It is the mission of the work teams to stabilize, to standardize and to streamline manufacturing to produce parts with the lowest cost, to minimize the consumption of all resources, to manufacture in the shortest time, and to develop a system of manufacturing, which consistently exceeds customer requirements"

Just-In-Time Organization: An Overview

"A sense of the value of time—that is, of the best way to divide one's time into one's various activities—is an essential preliminary to efficient work; it is the only method of avoiding hurry." ~Arnold Bennett

In the simplest terms Just-In-Time is a manufacturing and stock-control system in which goods are produced and delivered as they are required. The technique is designed to eliminate waste and to avoid the need for large inventories.

Just-in-Time was first emerged in the Ford manufacturing revolution in the early 1920's. Henry Ford; "We have found in buying materials that it is not worth while to buy for other than immediate needs. We buy only enough to fit into the plan of production, taking into consideration the state of transportation at the time. If transportation were perfect and an even flow of materials could be assured, it would not be necessary to carry any stock whatsoever. The carloads of raw materials would arrive on schedule and in the planned order and amounts, and go from the railway cars into production. That would save a great deal of money, for it would give a very rapid turnover and thus decrease the amount of money tied up in materials. With bad transportation one has to carry larger stocks."

The next major breakthrough in Just-In-Time came at Toyota in the 1950's, when Chief Engineer Taichi Ohno recognized the assumption that these methods were only suitable for large volume manufacturing was in-

correct. He realized that if the operation were made more flexible, they could reduce the overhead cost and reduce the economic lot size. This in turn led to the development of Single Minute Exchange of Die at Toyota, when engineer Shigeo Shingo attacked the bottleneck problem of

reduced lot or run sizes, by achieving rapid changeover from one production run to the next.

Just-In-Time methods and practices continued to evolve, and generated one of the most influential statements in efficient manufacturing, from Fujio Cho of Toyota. *See left.* This minimalist approach to manufacturing eliminated anything which was not necessary

to an activity, and it ensured that everything that was necessary, was in the right quantity, at the right place at the right time. Why is this so important in diecutting manufacturing?

As with all manufacturing, commercial pressure has forced a change in the way we price and cost our products and services. In the beginning it was simple. We added our costs and the profit we thought was fair to determine our price. Naturally, this Time plus Materials approach to manufacturing was safe and good for the manufacturer. However, increased competition led to Market Driven Pricing, in which the price is determined by the mar-

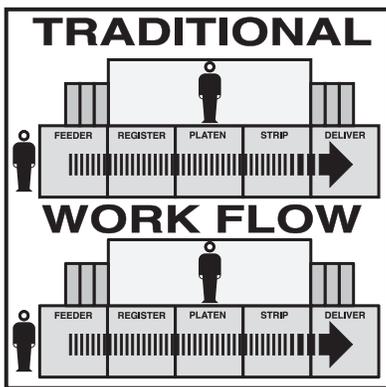
ket, and profit is calculated by subtracting cost from the price. This is obviously good for the purchaser. However, our ability to survive is predicated on adopting Productivity Driven Pricing. In this method Costs are specified by subtracting our required profitability from the price driven by the marketplace!

"Waste can be defined as anything other than the minimum amount of equipment, material, parts, tools, space, and the worker's time, which are absolutely essential to add value to the product." Fujio Cho - Toyota

COMMERCIAL PRESSURE			
TIME & MATERIALS PRICING			
 COST	+	 PROFIT	=  PRICE
MARKET DRIVEN PRICING			
 PRICE	-	 COST	=  PROFIT
PRODUCTIVITY DRIVEN PRICING			
 PRICE	-	 PROFIT	=  COST

The ABC's of Fast Diecutting Press Changeover!

The reason it is called Productivity Driven Pricing is because we are, in the majority of situations, unable to set the market price. Therefore, our profitability is a function of subtracting our costs from the market price to generate our profit. As the only way we can do this is by attacking and lowering costs, productivity and efficiency become the primary driving forces of everyday activity in diecutting.



The reason Just-In-Time techniques are so important in diecutting is this is one of the most effective productivity tools to reduce operating cost.

Just-In-Time Organization: Problems & Solutions

"Lost time is never found again." ~John H. Aughey

Tradition is a wonderful legacy for each generation to learn from and to build upon. However, the assumption is in this flow from one generation to the next, the established tradition is continually mixed with new ideas, so the best of the old is integrated with the best of the new, to create a new tradition. Unfortunately, there is often a lag time or a period where some companies hold-on to traditional ways and means too long, and they are replaced by more flexible and more rapidly adaptive organizations.

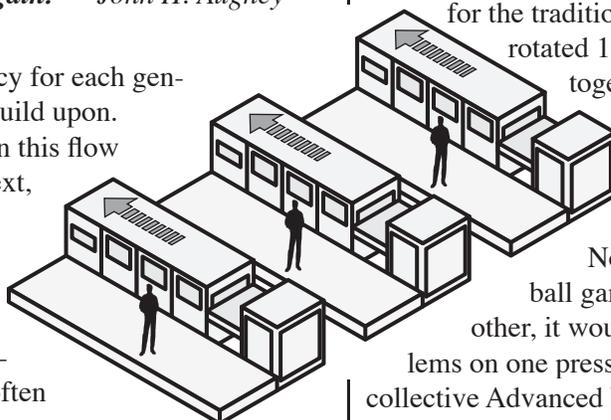
In spite of the explosion in computer-integrated-manufacturing and new technology, this is a common problem in the converting industry. A good example of this is Press Manning.

If we are to lower operating cost we have to look at a key cost, and that is people. The traditional approach to press manning was to have a feeder/assistant and a press operator, forming a two person team to run the press. In this Traditional Work Flow the presses were both aligned in the same direction and were positioned in a logical side-by-side manner. *See top of the column.* To control cost

many organizations simple cut the two man team in half, and had a one man team to run each press. *See below, center.*

While it was certainly not popular with the diecutting team, in the face of rising cost, and no apparent alternative, it became the new "normal" press manning tradition. However, two key issues are undermining this approach. The first is the orientation of the presses. In practice this has inserted a wall dividing the operators on each press from one another, making cooperative assistance quite difficult. Secondly, the advent of blanking and the increased number of short runs, and subsequent increase in changeovers per shift, has made the work of the single press operator very challenging.

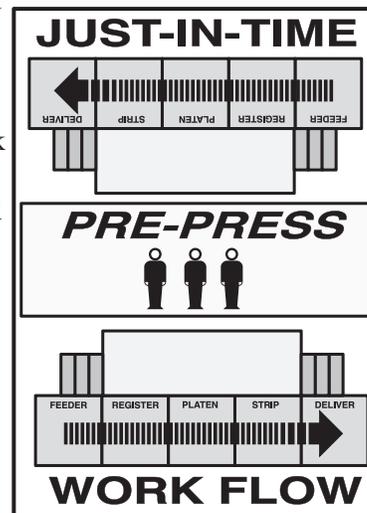
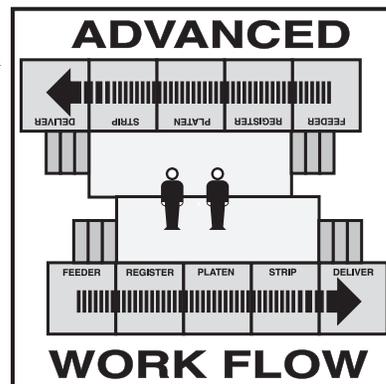
This is where Just-In-Time organization comes to the rescue because the solution is simple, if somewhat radical for the traditionalists. One of the presses is simply rotated 180 degrees and the platforms joined together. (When doing this I always recommend adding an extended platform between the presses to give more space.) *See above.*



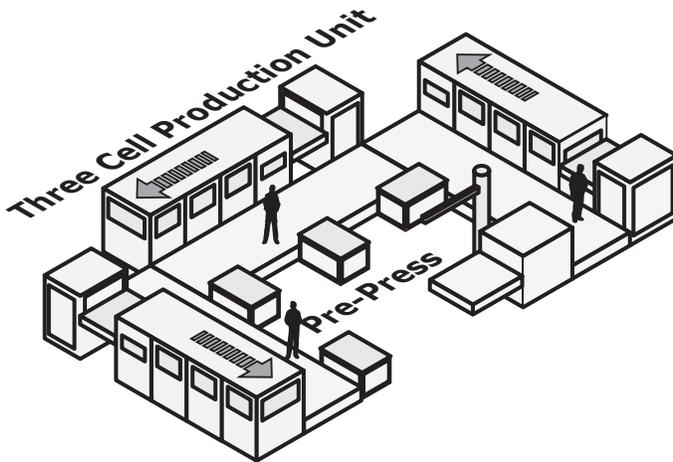
Now we have a completely different ball game. This team cannot only help each other, it would be difficult to ignore the problems on one press or the other, or to cooperate in the collective Advanced Workflow system of diecutting.

The next step in creating a more effective method of press manning is to insert the pre-press discipline between the two presses in a layout often referred to as a Just-In-Time Work Flow. *See right.* This integration of pre-press and diecutting is an entirely logical arrangement, and is sometimes referred to as a Diecutting Business Unit.

The next step in this progression is to create a



work cell, which contains three presses and also integrated the pre-press discipline. *See below.*

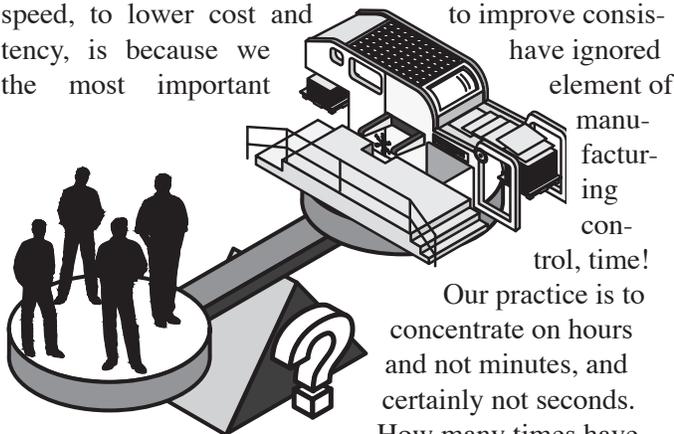


The challenge for all of us involved in diecutting is, and please excuse the pun, to think and act outside the box. We have to organize personnel, processes, and the production flow, to meet the need of each one, and to maximize the productive potential of all.

It is Just-In-Time principles and practices that look at alternative methods, however, Just-In-Time has powerful productive implications in every process in the organization. So what are the problems we face?

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

The reason we find ourselves struggling to increase speed, to lower cost and to improve consistency, is because we have ignored the most important element of manufacturing control, time!



Our practice is to concentrate on hours and not minutes, and certainly not seconds. How many times have

you heard someone say, *“It will only take a few minutes to find the tools?”* Everything we do is measured in Activity Time and Elapsed time, and seconds do count. It is because we do not really value and measure, and conserve time, that we have fallen behind the productiv-

ity curve. In practice, we hold technology and equipment in higher regard than we do people, and while we concentrate on machine efficiency we generally ignore work area efficiency and people efficiency.



We have ignored the difference between value added time and non-value added time as a powerful organizing tool for work areas and for activities. We have dismissed Time & Motion disciplines, as something which may work in other industries, but is certainly not right for diecutting!

And we have held onto the past for too long. Everything we do is build on tradition and knowledge passed from generation to generation. However, there should be a filter in this information flow, which helps to eliminate less productive elements of the traditional methods, and to introduce new techniques and methods, made possible by new technology, better materials and greater knowledge about the process.

We are convinced we are doing everything the best way, and the problem is we are planning, organizing, training and working, using a system of manufacturing, which is generations out of date!

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which anything proceeds, and is the basis for an action or for a response...

The cause of this problem is a commitment to introspection and isolation! We talk about training and education, but we rarely attend industry shows in any numbers, we fail to invest in the seminars and training programs we need, we fail to participate in Trade Associations, where we can gain new ideas and insights, and we fail to travel to Europe, (which is often less expensive that traveling within the United States), where we can visit similar companies, without the problem of competitive position.

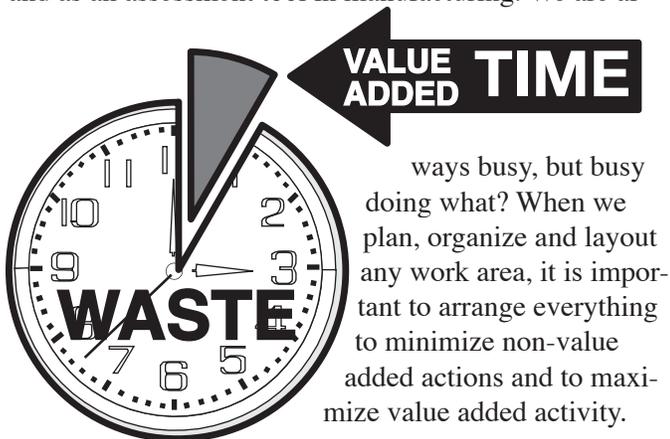
	Teach Time Management?
	Integrate Time based Measurement?
	Develop Time focused Benchmarks?
	Compete against Time?

We talk a great game but we practice badly and we execute poorly. We do not

understand the importance of time in manufacturing, and we have little curiosity or desire to learn.

The ABC's of Fast Diecutting Press Changeover!

We do not use the important difference between value added time and non-value added time as a measurement and as an assessment tool in manufacturing. We are al-



ways busy, but busy doing what? When we plan, organize and layout any work area, it is important to arrange everything to minimize non-value added actions and to maximize value added activity.

Time is our most valuable resource and it is important to organize every element of the diecutting operation to minimize the expenditure of time. How do we waste time? There are generally 7 recognized sources of re-

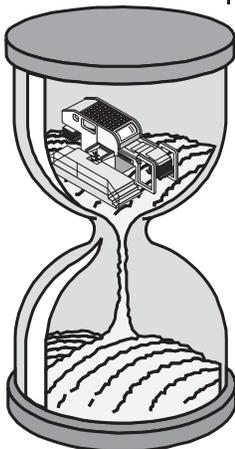
7 Waste Sources	
	Time
	Motion
	Processing
	Defects
	Over-Production
	Inventory
	Transportation

source waste in manufacturing. See left.

An excellent example of outrageous waste, is an operator standing next to a machine watching it run. Have we so little confidence in our set-up that we have to be on hand every second to prevent a disaster? Do we have a problem with security? Is someone going to

steal the diecutting press? Now I can understand someone working on other tasks in close proximity to the press, just in case a major pile up occurs, and the press does not trip out? This is evident in the Advanced Work Flow Diagram and the Just-In-Time Work Flow layouts, in which there are preparatory and purge activities going on immediately next to the press, but the idea of investing in an experienced professional diecutter to simply watch the press run is preposterous!

So in practice, we are simply ignorant of the standard, and relatively simple manufacturing organizations methods,



which are driving world class companies to succeed in a global economy. So how do we begin to turn the diecutting operation around and prepare for a more efficient changeover from one job to the next?

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

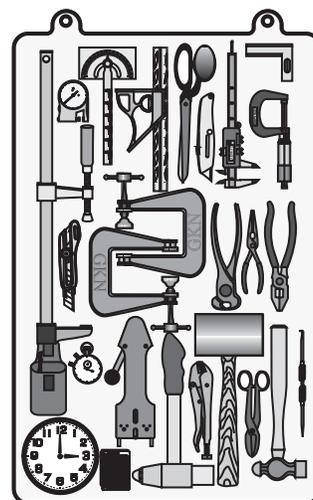
Before describing the solution, it would be beneficial to describe an optimal Just-In-Time organized workplace everyone is familiar with, from personal experience or from watching too many medical dramas. The example is the operating room in a hospital.



In this specialized environment every single item is pre-determined and pre-checked; everything is in optimal condition; everything is stored as close to the action as possible without crowding the activity; everything is stored in the identical

location it was stored in as it was every other time the work area was used; every material, every supply, every tool, every piece of equipment, every piece of information, and every component, is stored in a predetermined location, and consistently applied location; everything that is needed is available and nothing that is not needed, the area is as compact as possible, but not so compact as to inhibit the activity; at the end of every cycle, the work area is purged, restocked, and prepared for the next emergency; during the activity the work area is restricted with only essential personnel admitted; every team player has a designated role and a designated position during the activity; and every team player understands the sequence of events and is ready on cue to provide the technical assistance required.

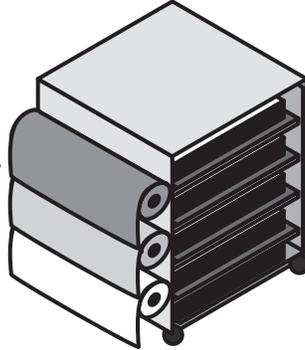
They also became members of this elite team after extensive training and education. This is the same as press changeover! You may disagree, but in principle the only difference is the activity,



the tools, and the skills being applied. The principles and the practices of how this room or work area is organized is identical to the principles and practices used to organize fast press changeover.

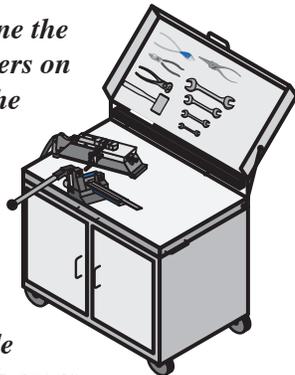
As specified in different sections of this manual, the first step is to get everyone together.

→ *The first step in any new project must be to get the entire work team together to describe the project, to outline the potential benefits of the change, to discuss the obstacles and challenges, and to brainstorm methods and practices for starting the project.*



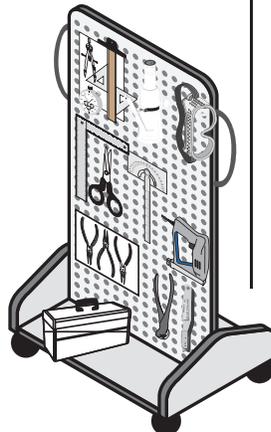
→ *The work team should adopt the description of the Hospital Emergency Room as the model for the reorganization of key areas of activity or work areas, on-press and off-press.*

→ *The work team should define the work areas or activity centers on press. These will include the operator side of the press, the off-lay or gear side of the press, the end of the feeder and the end of the delivery. In addition, we must include the underside of a unit and the inside of a press unit. These work areas could include:*



- * *The Press Feeder*
- * *The Press Feedboard*
- * *The Platen Stack*
- * *The Platen Well*
- * *The Stripping Unit*
- * *The Blanking Unit*
- * *The Delivery*
- * *The Waste Extraction System*

→ *The next step is to prioritize these work areas or work cells, for Just-In-Time Calibration. My suggestion would be to begin at the Platen Stack or Diecutting Section as this is where the majority of work*



takes place.

→ *With the specific work cell selected, the organization of the work area can begin. This requires listing everything required to complete the activity, and without leaving the work area. This would include:*

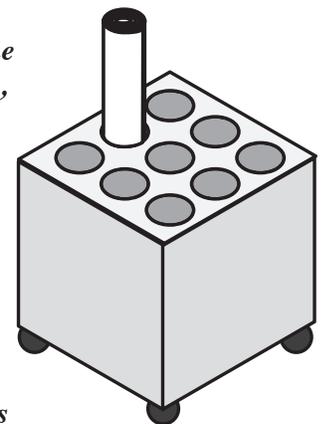
- * *Job Information & Storage*
- * *All Hand Tools*
- * *All Power Tools*
- * *All Power Outlets*
- * *All Air Outlets*
- * *All Converting Tools*
- * *All Materials*
- * *All Supplies*
- * *All Parts & Components*
- * *All Equipment*
- * *All Safety Gear*
- * *All Maintenance Equipment*
- * *All Maintenance Supplies*
- * *Any First Aid Supplies*



→ *The principle here is once you have started an activity, there should be no reason to leave the work cell other than for a scheduled break, a toilet break, or a personal emergency. Walking to get information or looking for a tool is a non-value added activity, which must be eliminated and most certainly converted from an on-press activity, an Internal activity in SMED, to an off-press activity, and External activity in SMED.*

→ *One of the disadvantages of the standard press platform is it is often too small to properly organize and to execute a team make-ready. By rotating one adjoining press or by extending the standard press platform, we can create a more effective and a safer working area.*

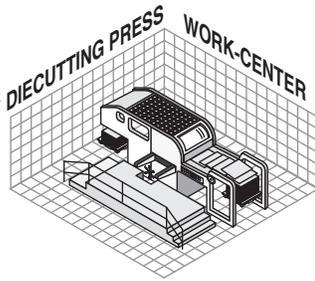
→ *The next step requires creating an accurate map of the press and the surrounding areas, particularly if these areas are involved in press changeover, or are used as staging areas for new and old tools. The map should be executed on graph paper, or directly programmed into a CAD System, using a scale*



The ABC's of Fast Diecutting Press Changeover!

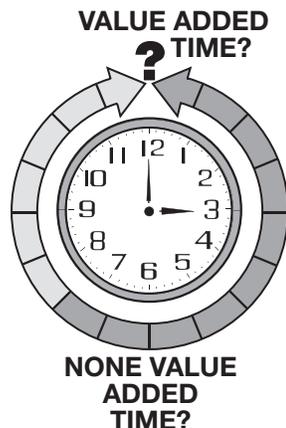
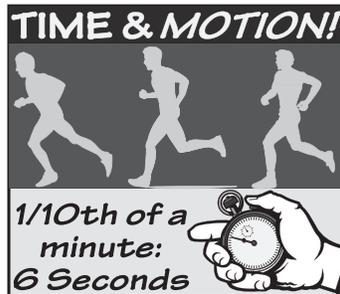
such as 1/4" per foot.

→ The next step requires using the map to position all of the tools, supplies and components which will be used in make-ready. There are two options here. They can be permanently located, in single source, color coded or shadow box locations, or they can be transported in on specially designed tool, equipment and materials carts, which are pre-positioned by the pre-press team. The advantage of the mobile cart system is each cart can be customized precisely for each press make-ready, and it can be returned to the pre-press area, where the cart can be purged and replenished for the next make-ready.



→ It is important to remember using pull down overhead tool and material holders. Many companies utilize this technique to have the tools and materials instantly accessible, and the counterbalanced toolholders can be pushed upward and locked out of the way when they are not in use.

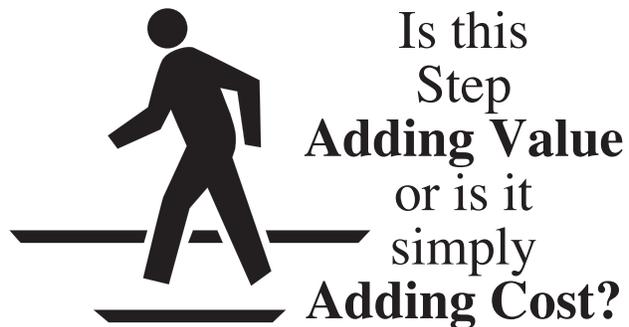
→ An important point in this organization system, is that personal tools are not allowed. If everyone had their own tools we have immediately given up standardization and consistency. Have you ever looked inside one of these toolboxes? Tools are mixed together in a chaotic mix of different implements and because the toolboxes are not organized with color coded, single source or shadow box locations, retrieving and searching for missing tools consumes 5 to 10 minutes every make-ready. Five minutes may not seem a great deal of time, however, if we do one changeover per shift on three shifts, and we work 5 days per week, that is one hour and 15 minutes per week, and 64 hours and 30 minutes per year. Five minutes every make ready is an enormous block of time, and in this very conservative



estimate, it means we lose one press for all most 8 shifts per year! This is simply not acceptable!

→ Remember an earlier requirement of high speed manufacturing. You can do this job any way you want as long as you all do it the same way! When we allow personal tools we are allowing the process to be undermined by all of the different ways and inconsistencies, people bring to their personal discipline. This is now a team approach and everything must be consistent. So the personal tools are out!

→ The positioning of tools and materials is critical. Every step we take, every time we reach for a tool, consumes the base time block of time manage-



ment, 6 seconds. Also we defined transportation as one of the potential waste sources in manufacturing. Therefore, all of the tools, the materials, the components, and the parts must be positioned as close to where they will be used as possible.

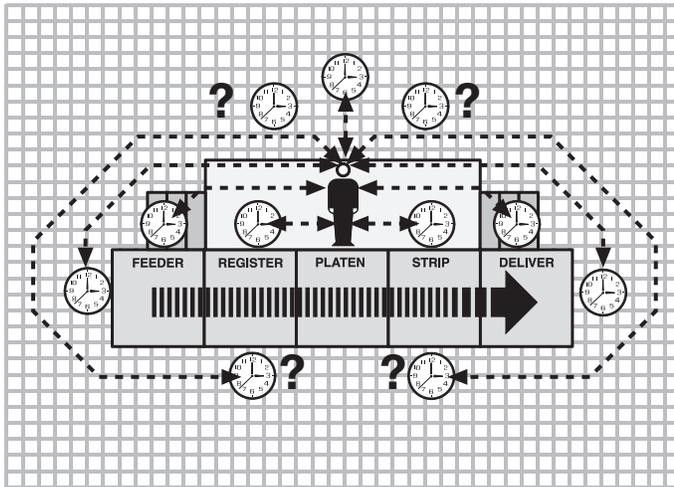
→ Where necessary tools must be duplicated, and where possible fastened in position using a retractable, spring loaded wire or nylon hawser. This will ensure the tools are where they are needed, when they are needed and it is impossible to inadvertently remove a key tool from the work area.

→ One of the interesting modifications made to Western equipment by the early Japanese pioneers of Just-In-Time, was to modify all of the heads of the bolts, and all of the sockets of the Allen bolts to have the same size bolt head or the same size Allen wrench. We would probably describe

Press Just-In-Time Organization Map: Advantages

- A Documented fast Access Layout
- Simple to change, upgrade, & improve
- Fast Pre-Make-Ready Verification
- Save time, reduce fatigue, & stress
- Integrate Standard Operating Procedures
- Unification of best methods & practices
- Color-coded single source locations
- Greater efficiency in speed & precision
- Simplify training & skill development
- Fast consistent press changeover

this initiative as not worth the effort, but having a single tool, spanner at one end, and an Allen key for the other end, saved sufficient time from every press set-up, to pay for the expenditure in a matter of weeks!



→ *It is an advantage to pre-plan the pre-positioning of tools, equipment, materials and parts in each work area, however, it usually proves effective to implement the set-up over several changeovers. This is important as the planning on-paper is rather different to the actual process on-press. It will usually take several sessions to fully customize a work area.*

→ *It is also an advantage to work on one area, to minimize any potential disruption, and also to expedite the completion of one area. When the first area is complete the next area can be started.*

→ *Naturally, when the Just-In-Time organization of each work area is complete, the area should be mapped, on paper and on videotape, with every tool, every material, and ever component position identified and marked. (In practice an area is never completely finished as progressive changeover cycles will reinforce the optimal layout and expose changes to improve utilization of the area.)*



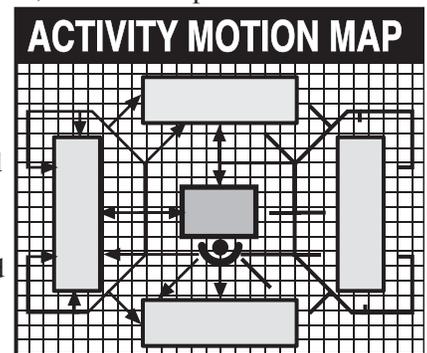
The goal is to be able to start each make-ready with everything pre-positioned, so every part, tool, materials, supply, piece of information, and components are on-press. It is estimated that more than 25% of the activity in an average press make-ready is non-value added time

He who has no taste for order, will be often wrong in his judgment, and seldom considerate or conscientious in his actions.

consumed in looking for tools, getting materials and equipment, verifying information, replacing damaged parts, and relocating misplaced parts!

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

An innovative method of simplifying what may seem a difficult analytical task, is to videotape several changeover cycles, and to watch them as a team, and to note what tool, material or part is being used and where.



This can be combined with videotaping the work in the press

unit the team has selected as the highest priority, for a number of changeover cycles. If this is done with a voice recorded narration and set to capture the sounds of the changeover, the recorder and or the team member can call out the name of the tool or the material or the component, which is being used each time.

As part of the analysis of all of the tools, materials, and components, it is useful to give every tool, part, material, component, and even supplies has an identification number, to make inventory management simpler, and to develop a pre-press checklist to ensure everything is in the right place, ready for each changeover.

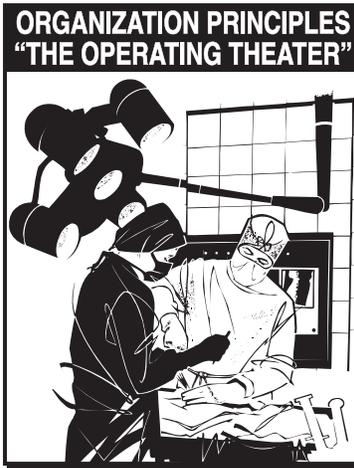
The Goals of Just-In-Time Organization:
“A man who dares to waste one hour of life has not discovered the value of life.” ~Charles Darwin

I recommend you to take care of the minutes, for the hours will take care of themselves.

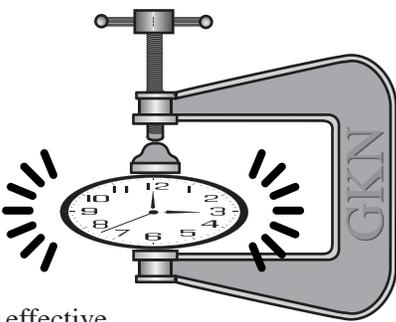
Imagine you are the chief surgeon of a crack medical team called upon to perform an emergency operation on a patient in a life or death situation. When you walk into the operating room and to the patients side, the entire team is assemble and ready in their designated positions, and

The ABC's of Fast Diecutting Press Changeover!

every tool, material, supply and specialized piece of equipment is exactly where it is supposed to be, and you can be confident it is in optimal condition. This entire scenario is set-up for speed of execution, for quality of action, for consistency of results, and is designed to complete the activity in the shortest possible time. At the conclusion of the operation, and as the patient is wheeled to the recovery room, you can hear the team behind you cleaning, purging and resetting for the next emergency, whenever it will take place.



Of course we are not surgeons, and diecutting is not strictly a matter of life and death, although admittedly, it often feels like it is! But the organization principles,

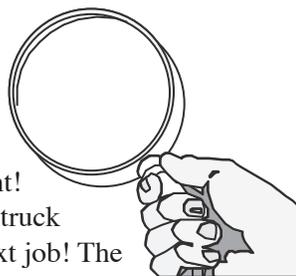


effective.

This is not Rocket Science! This is not complicated! This is not difficult! This is simply a careful pre-preparation of all the things necessary to complete a known activity, in a known area, in a known amount of time. The majority of time expended in press make-ready is waste and non-value added actions and activity because of excruciatingly poor planning, ineffective preparation, and a failure to purge and replenish for the next changeover cycle.

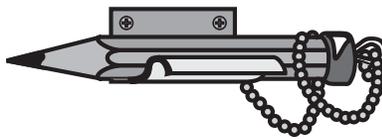
I am confident you have experienced at least one of the following non-value added activities several times over the past weeks, even though until now, they were probably invisible as signs of poor organization.

The work order is not to be found! The carbon paper is stored at the end of the department! You have to hunt down the pallet truck to position the first load of the next job! The



ORGANIZATION PRINCIPLES "THE OPERATING THEATER"

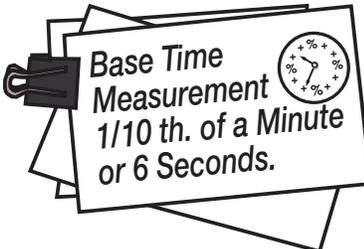
springs in several of the bottom pins are ineffective and other pins are bent and have to be replaced! There is rubber missing from the die! Someone has borrowed your power drill! You have run out of masking tape! You have the wrong Thin Plate for this job! One of the suckers in the feeder has to be replaced! You do not have a 0.012" grinding wheel, they are all broken! A piece of Matrix is missing from the die and has to be replaced! There are no clean rags to wash the cutting plate! One of the die bolts is protruding above the backplate and



has to be filed down! The extension cable is missing! The adhesive has run out! The stripping unit guard hinge is loose, etc, etc, etc!

When you take the time to look at the videotape recording of each make-ready, and think in terms of value added and non-value added time, and count the minutes needlessly wasted, you will be embarrassed by the lack of basic organization.

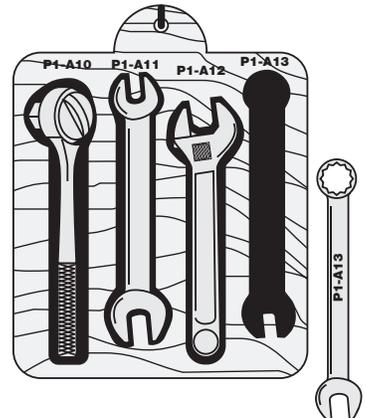
The goal of Just-In-Time Organization is to so thoroughly prepare the work areas for each activity, the transition



from one action to the next is smooth, seamless and uninterrupted by non-value added activity. It is also critical to develop a comprehensive inventory management checklist for

everything used in make-ready, to map the press work areas, and to develop permanent, single source, shadow box storage, for every critical component. If parts, materials, and components are brought to the press from a remote storage location, they must be organized on modular, mobile and clearly labeled storage units, which are always located in the same position every time.

Effective pre-preparation for changeover, results in effective changeover performance, and poor preparation results in poor changeover performance. How would you rate your organizations changeover preparatory system and



readiness for the next changeover?

Just-In-Time Organization:

Methods & Practices

“Short as life is, we make it still shorter by the careless waste of time.” ~Victor Hugo

The key methods and practices in adopting the Just-In-Time organization system is to **think differently** about the value of time and the value of every step you take during changeover. It is not possible to continue the way we are currently doing things, to survive we have to instigate dramatic change.

Most organizations, left to their own devices, are going to atrophy, to get so institutional, so bureaucratic, that they get to the point where their original reason for existence has been lost, and they stagnate. So you have to change, and by that I mean dramatic change.
William G. McGowan

For example, if you were working on the stripping section of the platen diecutter, and you needed an Allen key, which was on the die-chase support arm, this would take approximately 6 seconds to reach for and retrieve the tool.

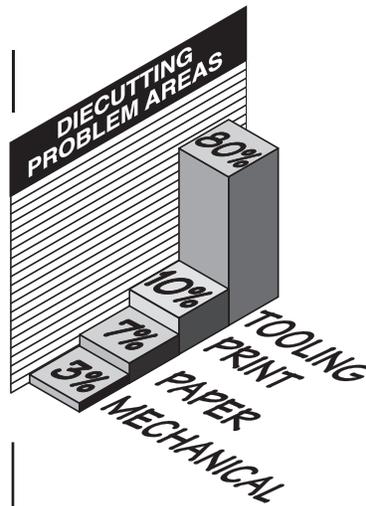
However, if the Allen key was on the furthest die/chase support arm, and the die/chase was extended and resting on the arms, you would have to walk from the stripping unit, around the extended die, pick up the tool and walk back to your original position. This would take approximately 24 seconds to retrieve the tool. Unfortunately, 18 seconds of this time was non-value added, because it could have been easily eliminated.

18 seconds you say! What is the big deal?

It is not good news but if you watch a press make-ready, the majority of the steps and actions are non-value added, because the discipline of the press technician is not focused upon time and time management, the work area on the press is poorly organized, and there is no standardized set of operating procedures.

What could we do about this to encourage everyone to be well organized?

→ **The first obvious action is to wear a tool belt. And**



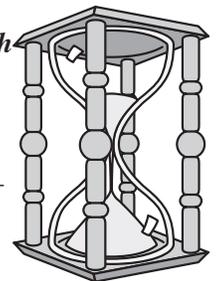
this is not just any tool belt. It is brought to the press by the pre-press team, and it is fitted with all of the tools, you most frequently use during changeover.

→ *The second obvious action is to duplicate the tool, and position it at the stripping station, in a shadow box, temporarily attached to the face of the press at the beginning of press make-ready.*

→ *These can be attached to hooks and are positioned at the beginning of changeover, and retrieved and the tools checked and counted, ready for the next changeover.*

→ *The third obvious solution is to duplicate the tool and to permanently affix it, where it will be used, attached to a spring loaded wire hawser.*

→ *If you are touching the tool in any way, other than to install, center, align, and lock the tool in position, the tool is incorrect. (Remember, statistically the majority of time expended in press changeover, and in lost press production time is associated with working on the diecutting, stripping and blanking tools!)*

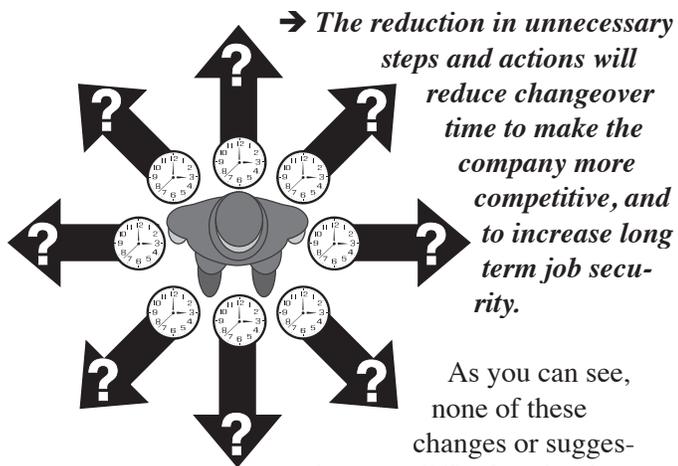


So, what would be the benefits of adopting some of these changes?

- *By minimizing non-value added actions, time will be saved and the changeover completed faster.*
- *By minimizing non-value added actions, time will be saved and the changeover will cost less, and improve turnaround and speed to market projections.*
- *The reduction in unnecessary steps and actions, will reduce travel distances and motion, to lower fatigue.*
- *The reduction in unnecessary steps and actions, will reduce travel distances and motion, to minimize the chance of accidents and injury.*
- *The reduction in necessary steps and actions, will make the changeover task, simpler and easier to*

The ABC's of Fast Diecutting Press Changeover!

minimize stress and frustration.



however, they represent a very different way of looking at work organization. By creating customized Just-In-Time work areas, we have combined the best ideas of everyone in the team, we have standardized a key part of the system of press changeover, and we have created an environment, which will induce everyone involved to be as efficient and as effective as possible.

Just-In-Time Organization: The Benefits of Change

"Lose an hour in the morning, and you will spend all day looking for it." ~Richard Whately

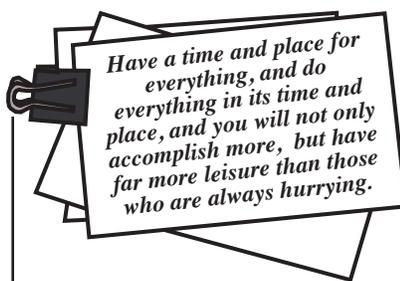
When seeking to improve changeover performance it is



○ ○ ●
Methods Practices Procedures

obvious we need to keep coming back to standardize, stabilize and streamline.

We have to stabilize, because if everyone is doing it differently, and there are no methods to coerce participants to even be consistent from one cycle to the next, we will



never achieve a unified system of changeover, or establish benchmarks to assess progress toward productivity goals.

We have to standardize, because without a standard work area, what would be the point of attempting to create a standard operating procedure. In fact, as we have described in earlier sections, standardization is the cornerstone of training, of faster processing, and of greater operating consistency.

We have to streamline, because it is essential to make the work area and the procedures as spare, as lean, and as fast

as possible. This requires a standard approach, which everyone is familiar with, and by funneling every team member into this consistent work format we will improve knowledge, skill, and the flow of suggestions to make it even easier.

The benefit of adopting Just-In-Time organization principles is the focus on

7 Waste Sources

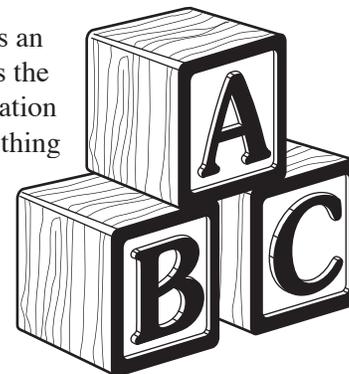
	Time
	Motion
	Processing
	Defects
	Over-Production
	Inventory
	Transportation

timing every activity and the placement of everything involved in the activity to reflect that time based approach, forces everyone into a more cooperative, and a more consistent way of doing things.

The introduction to the ideas of the seven forms of waste in manufacturing, and the practice of evaluating every move and every placement of everything involved, based around value added or non-value added time, is a critical advantage in the way the work teams organize all of their activity.

Just-In-Time organization is an effective training system, as the stabilization and standardization of a work area makes everything easier to understand, faster to assimilate, and simpler to master.

Just-In-Time organization is close-loop of activity, as



the adherence to a standardized methodology for procedures and work area organization, reinforces the principles during every changeover cycle.

Ultimately, the Just-In-Time discipline makes the work easier to execute, it makes it simpler to get everyone working together, and it drives improved performance changeover to changeover.

Just-In-Time Organization:

Recommended Actions

“Time is at once the most valuable and the most perishable of all our possessions.” ~John Randolph

Just-In-Time is not a difficult concept for the teams to understand, however, implementation requires breaking down years of ingrained habit, and considerable resistance to change. Slow and steady is the most effective approach.

- ➔ ***The first step in any new project must be to get the entire work team together to describe the project, to outline the potential benefits of the change, to discuss the obstacles and challenges, and to brainstorm methods and practices for starting the project.***
- ➔ ***The work team should adopt the description of the Hospital Emergency Room as the model for the reorganization of key areas of activity or work areas, on-press and off-press.***
- ➔ ***The work team should define the work areas or activity centers on press.***
- ➔ ***The next step is to prioritize these work areas or work cells, for Just-In-Time Calibration.***
- ➔ ***With the specific work cell selected, the organization of the work area can begin. This requires listing everything required to complete the activity, and without leaving the work area.***
- ➔ ***The principle here is once you have started an activity, there should be no reason to leave the work cell other than for a scheduled break, a toilet break, or a personal emergency.***
- ➔ ***One of the disadvantages of the standard press platform is it is often too small to properly organize and to execute a team make-ready. By rotating one adjoining press or by extending the standard press platform, we can create a more effective and a safer working area.***

The ABC's of Fast Diecutting Press Changeover!

- ➔ ***The next step requires creating an accurate map of the press and the surrounding areas, particularly if these areas are involved in press changeover, or are used as staging areas for new and old tools.***
- ➔ ***The next step requires using the map to position all of the tools, supplies and components which will be used in make-ready.***
- ➔ ***It is important to remember using pull down overhead tool and material holders.***
- ➔ ***An important point in this organization system, is that personal tools are not allowed.***
- ➔ ***Remember an earlier requirement of high speed manufacturing. You can do this job any way you want as long as you all do it the same way!***
- ➔ ***Where necessary, tools must be duplicated, and where possible fastened in position using a retractable, spring loaded wire or nylon hawser.***
- ➔ ***One of the interesting modifications made to Western equipment by the early Japanese pioneers of Just-In-Time was to modify all of the heads of the bolts, and all of the sockets of the Allen bolts, to have the same size bolt head or the same size Allen wrench.***
- ➔ ***It is an advantage to pre-plan the pre-positioning of tools, equipment, materials and parts in each work area, however, it usually proves effective to implement the set-up over several changeovers.***
- ➔ ***It is also an advantage to work on one area, to minimize any potential disruption, and also to expedite the completion of one area.***
- ➔ ***Naturally, when the Just-In-Time organization of each work area is complete, the area should be mapped on paper and on videotape, with every tool, every material, and every component position identified and marked.***

As you can see this is not a difficult project to organize, however, the steps and the progress will be slow, as everyone in the work teams learn to think in terms of value added time and non-value added time. And to return everything back where they got it from!

memo:

“If we don't change direction, we'll end up where we're going!”

Section Twelve:

Just-In-Time Organization: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ In the simplest terms Just-In-Time is a manufacturing and stock-control system in which goods are produced and delivered as they are required. The technique is designed to eliminate waste and to avoid the need for large inventories.
- ✓ As with all manufacturing, commercial pressure has forced a change in the way we price and cost our products and services. In the beginning it was simple. We added our costs and the profit we thought was fair to determine our price. Naturally, this Time plus Materials approach to manufacturing was safe and good for the manufacturer. However, increased competition led to Market Driven Pricing, in which the price is determined by the market, and profit is calculated by subtracting cost from the price. This is obviously good for the purchaser. However, our ability to survive is predicated on adopting Productivity Driven Pricing. In this method Costs are specified by subtracting our required profitability from the price driven by the marketplace!
- ✓ Tradition is a wonderful legacy for each generation to learn from and to build upon. However, the assumption is in this flow from one generation to the next, the established tradition is continually mixed with new ideas, so the best of the old is integrated with the best of the new, to create a new tradition. Unfortunately, there is often a lag time or a period where some companies hold-on to traditional ways and means too long, and they are replaced by more flexible and more rapidly adaptive organizations.
- ✓ The reason we find ourselves struggling to increase speed, to lower cost and to improve consistency, is because we have ignored the most important element of manufacturing control, time! Our practice is to concentrate on hours and not minutes, and certainly not seconds. How many times have you heard someone say, *"It will only take a few*

minutes to find the tools?" Everything we do is measured in Activity Time and Elapsed time, and seconds do count. It is because we do not really value and measure, and conserve time, that we have fallen behind the productivity curve. In practice, we hold technology and equipment in higher regard than we do people, and while we concentrate on machine efficiency, we generally ignore work area efficiency and people efficiency.

- ✓ The cause of this problem is a commitment to introspection and isolation! We talk about training and education, but we rarely attend industry shows in any numbers, we fail to invest in the seminars and training programs we need, we fail to participate in Trade Associations, where we can gain new ideas and insights, and we fail to travel to Europe, (which is often less expensive than traveling within the United States), where we can visit similar companies without the problem of competitive position.
- ✓ In a specialized hospital operating room every single item is pre-determined and pre-checked; everything is in optimal condition; everything is stored as close to the action as possible, without crowding the activity; everything is stored in the identical location it was stored in every other time the work area was used; every material, every supply, every tool, every piece of equipment, every piece of information, and every component, is stored in a predetermined location, and consistently applied location; everything that is needed is available and nothing that is not needed, the area is as compact as possible, but not so compact as to inhibit the activity; at the end of every cycle, the work area is purged, restocked, and prepared for the next emergency; during the activity the work area is restricted with only essential personnel admitted; every team player has a designated role and a designated position during the activity; and every team player understands the sequence of events and is ready on cue to provide the technical assistance required.

Section Twelve:

Just-In-Time Organization: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ What is the Just-In-Time Discipline?
- ✓ When did Just-In-Time organization first appear in the America and why was it so important?
- ✓ Explain how Time and Materials pricing works?
- ✓ Explain how Market Driven pricing works?
- ✓ Explain how Productivity Driven pricing works?
- ✓ What is Advanced Work Flow method of organizing press layout and press manning?
- ✓ What is Just-In-Time Work Flow method of organizing press layout and press manning?
- ✓ Why do minutes and seconds count in the Just-In-Time Discipline?
- ✓ What is value added time and non value added time and why is this such an important discipline?
- ✓ What are the Seven Waste Sources in Manufacturing?
- ✓ Why do you think the Hospital Operating Room was defined as the perfect example for Just-In-Time organization in press changeover?
- ✓ Name three of the On-Press Work Areas, and suggest two off-press work areas?
- ✓ What are we hoping to achieve creating a map of the press layout?
- ✓ What is the purpose of listing and giving every tool, material, part, supply, component, material and piece of equipment in use in press changeover?
- ✓ Why is the position and the location of tools so critical in the Just-In-Time Discipline?
- ✓ What should be done to the press platform to improve the efficiency of press changeover?
- ✓ How could we ensure the tools required for a specific area stay in that area?
- ✓ What is the critical rule about the way everyone does things in key activities?
- ✓ What is the base time block in Just-In-Time organization?
- ✓ Do you believe Just-In-Time is practical?

Manufacturing System of Organization

Section 13: Single Minute Exchange of Die (SMED)

Key Definitions: ... Single Minute Exchange of Die represents a set of principles and procedures, designed to continuously reduce waste in manufacturing ... SMED provides a rapid and an efficient way of changeover from one production process to the next ... it is a concept which states that all tool changeovers can be accomplished in 10 minutes or less...

The SMED Mission Statement: "It is the mission of the work teams to reduce the time consumed in changeover from one production job to the next, by separating Internal (on-press) from External (off-press) activity, by converting Internal activity to External Activity, and by streamlining External Activity and implementing pre-preparation for the next set-up."

Single Minute Exchange of Die:

An Overview

"Waste neither time nor money, but make the best use of both. Without industry and frugality, nothing will do, and with them everything."

~Benjamin Franklin

Single Minute Exchange of Die (SMED) is one of the most successful lean production methods for reducing waste in a manufacturing process. It provides a rapid and efficient way of changing over a manufacturing process from running the current production run, to running the next production run. It is also often referred to as Quick Changeover. It is a concept that says all changeovers can and should take less than 10 minutes ... hence the phrase Single Minute. Closely associated is an advanced concept of "One-Touch Exchange of Die", which says changeovers can and should take less than 100 seconds for each tool set.

There are a number of other key organization concepts integrated into this discipline, including "One-Touch Processing," which means the tool is only touched during changeover in installation and in deinstallation. (And why do we see it as necessary or even acceptable to work on tools on press?)

"Make-Ready improvement should generate defect free products from the first impression. It makes no sense to speed up changeover unless diecut product quality is enhanced."

The second important principle is "Mistake Proofing." This reflects an effort made in advance of a process to make it impossible or very difficult to do something in a wrong manner or to use a tool in an incorrect manner. One of

the best known examples of this is the inability to remove a car key from the ignition switch of an automobile if the transmission is not first put in the "Park," so that the driver is unable to leave the car in an unsafe parking condition where the wheels are not locked against movement.

THE S.M.E.D. PROCESS

There are Seven basic steps in the SMED system:

1. Observe current Methods
2. Separate Internal & External activity.
3. Convert Internal activity to External activity.
4. Streamline the remaining Internal activities, by simplifying them.
5. Streamline the External activities, by simplifying them.
6. Document & teach the new procedure.
7. Do it all again!

Many of these concepts and fast changeover practices were developed and fine tuned by the late Dr. Shigeo Shingo, who was a very successful industrial engineer in the Japanese manufacturing revolution after the second world war, where he played a key role in revolutionizing the way we all manufacture goods.

Shingo was born in Japan in 1909, and graduated in Mechanical Engineering in 1930. In 1955 he took charge of industrial engineering and factory improvement training at Toyota for both its employees and parts suppliers. During the period 1956-58 at Mitsubishi, Shingo was responsible for reducing the time for hull assembly of a super-tanker from 4 months to 2 months. This established a new world record in shipbuilding, and the system spread to every shipyard in Japan.

SINGLE MINUTE EXCHANGE OF DIE
The theory and the practice of performing set-up, changeover, or make-ready in under ten minutes per male and female tool exchange.

In terms of quality, Shingo's paramount contribution was his development in the 1960s of poka-yoke (mistake proofing) and source inspection systems. In 1970 he originated the SMED System (Single Minute Exchange of Die) which is part of the Just in Time system. The SMED system was born out of necessity in order to achieve Just-In-Time production, a cornerstone of effective manufacturing.

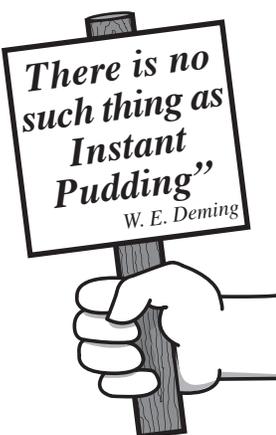
The ABC's of Fast Diecutting Press Changeover!



This system was developed to cut set-up times, enabling smaller batch sizes to be produced. The set-up procedures were simplified by using common or similar set-up elements whenever possible. This approach was in complete contrast with traditional manufacturing procedures, as Shingo pointed out: *“It is generally and erroneously believed, that the most effective policies for dealing with set-ups address the problem in terms of skill. Although many companies have set up policies designed to raise the skill level of the workers, few have implemented strategies that lower the skill level required by the set-up itself.”*

Single Minute Exchange of Die, Mistake Proofing, and One Touch Processing are practices which have generated great success in every different type of manufacturing process, including diecutting.

Single Minute Exchange of Die, Mistake Proofing, and One Touch Processing are practices which have generated great success in every different type of manufacturing process, including diecutting.



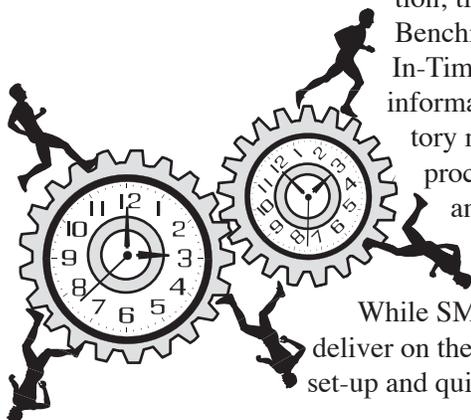
Single Minute Exchange of Die:

Problems & Solutions

“I must govern the clock, not be governed by it.”

~Golda Meir

One of the reasons the world wide success of Single Minute Exchange of Die has not more fully penetrated the Converting Industry in the US, is SMED is built around and depends upon, other consistently applied organizational disciplines being in place. These would include standardization; procedurally based training and education; time management, Benchmarking and Just-In-Time organization; information and inventory management, and process simplification and process measurement.



While SMED will and does deliver on the promise of faster set-up and quicker changeover,

it requires a disciplined workforce and a consistently applied system of manufacturing. SMED is far less effective, when the diecutting operation is poorly organized. Therefore, whether before or during the implementation of SMED, it is essential to begin adopting many of the disciplines outlined in other sections. In fact the implementation of SMED integrates many of the subjects covered by earlier sections of this manual.

The problem we face, is we will certainly fail if we think we can introduce SMED as a quick fix or as *“Instant Pudding”*, as Deming stated, or as an overnight solution, or simply the equivalent of a cure all pill for diecutting. If you have read the previous sections it is obvious there are no difficult or complex challenges in terms of organizing each process improvement discipline. The greatest challenge with all of these initiatives is getting the work teams to commit to participating enthusiastically.

Each of these projects, including Single Minute Exchange of Die, requires a team approach and great deal of team work and team discussion, the creation of a unifying team consensus, a degree of training and research, careful preparation, and steady step-by-step implementation. This is where we short change ourselves. Whenever a project is adopted in a carton or a container operation, there is so much pressure to *“Get Started”* and to *“Show Results”* the project is rushed, pushed and crushed.

Four goals of improvement:

- 1) *make things easier*
- 2) *better*
- 3) *faster and,*
- 4) *cheaper.*

To achieve this we must

- 1) *focus on goals*
- 2) *recognize multiple goals*
- 3) *pursue goals systematically gradually toward the higher level of underlying goals.*

Shigeo Shingo

We need to analyze problems based on 5 elements:

- 1) *Object* *“What”*
- 2) *Agent* *“Who”*
- 3) *Method* *“How”*
- 4) *Space* *“Where”*
- 5) *Time* *“When”*

We must not forget to observe both process and operation.

Shigeo Shingo

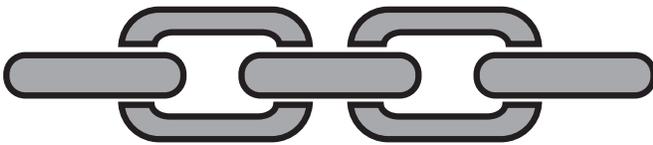
Premature project implementation encounters natural resistance from the entire work team, to rapid widespread change, for a *“flavor of the month”* project.

SMED is the integration of a number of simple, interdependent

disciplines, which if applied slowly and carefully in the beginning, will rapidly gain pace, and capture the minds and the enthusiasm of the work team. But we need to be civil, courteous and considerate, and be polite, patient, and persistent, as we market and sell the need for a radical change in the current system of diecutting converting.

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

The reaction of most diecutting professionals to the introduction of Single Minute Exchange of Die, is implementation is primarily about common sense. This is not a complex discipline, and the principles and practices are not difficult to learn or to master.



The problems we face are in two critical areas.

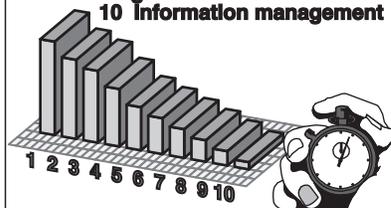
The first is in adopting and implementing standardized methods of executing key tasks. While everyone accepts the concept of procedural uniformity, it is difficult for each individual to modify and to accept a method of working which represents the consensus of the entire work team, and is different to the way they have been working for many years.

The second is in Parallel Processing. This simply means attacking changeover using a team approach, and that two or three changeover activities are happening simultaneously. The challenge here is working as a team, working safely and cooperatively, and communicating, discussing and resolving inevitable disputes or disagreements amicably. It is important they realize team building is a process to, and where we begin and where we end are two different places. It is important to bolster the team effort as this is the cornerstone of our future in diecutting converting.

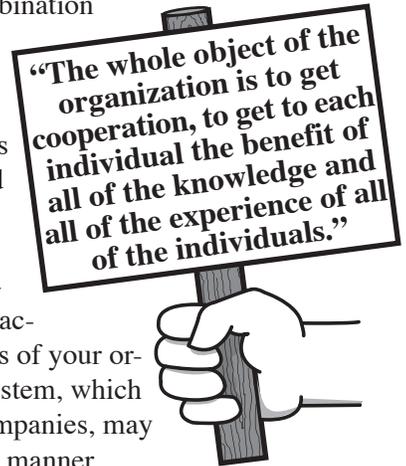
The challenge is to get everyone involved and truly committed to the project, and to keep an open mind as the process evolves.

CHANGEOVER: TIME ALLOCATION

- 01 Tool adjustment & modification
- 02 Trial manufacturing & adjustment
- 03 Installation of tooling
- 04 Press breakdown & resetting
- 05 Product inspection & testing
- 06 Deinstallation of tooling
- 07 Loading & qualifying materials
- 08 Production approval procedures
- 09 Cleaning & maintenance
- 10 Information management



Single Minute Exchange of Die is not a rigid set of pre-determined activities but rather a series of principles and concepts, which when combined with team knowledge and diecutting experience, will create a more effective system of manufacturing. The new system, which represents a combination of SMED, the unique knowledge and skill of the team members involved, and the methods and practices developed by the work teams.



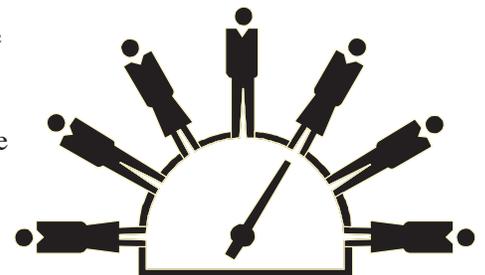
This will become a customized system, which accurately meets the needs of your organization, but it is a system, which other teams in other companies, may customize in a different manner.

SMED is simple, straightforward, flexible, and innovative, and represents guidelines rather than rules. So how did we paint ourselves into the corner we now occupy?

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

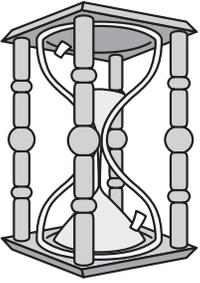
The primary cause of the current performance problem is we do not value time. In fact it would be more accurate to say, we do not value small increments of time, such as 3 minutes or 25 seconds. We all know that there are 60 seconds in a minute and 60 minutes in an hour, and every second has the same value as every other second. However, although we accept the seconds steadily accumulate, and inexorably build minutes, hours and days, our filter is only set to large segments of time such as hours.

It is as though we are panning for gold in a stream and the filter we are using catches



15 ounce/minute gold nuggets, but anything less passes through. In the course of a day you may find one nugget of this size, but if we made the grid in the filter smaller, to catch 1 ounce/minute gold nuggets, we would capture 50 to a hundred one ounce/minute gold nuggets each day! The bottom line, if we do not measure and think in

The ABC's of Fast Diecutting Press Changeover!



terms of minutes, we do not value or protect them. And of course, 15 one ounce nuggets, while not as individually impressive as the 15 ounce nugget, have an identical value. And it is simpler and easier to capture the one ounce nuggets, than it is to capture the 15 ounce nuggets.

If we attacked press changeover with the goal of saving every minute we could, you would end up using all of the tools provided by Single Minute Exchange of Die. The cause of our problem is we simply do not focus on minutes, and our time measurement filter is not set to small enough gradients. I constantly hear the words; *“but it only takes a minute!”* But if we valued every minute with the same passion we have for quarter, half or complete hours, we would immediately see the current system of manufacturing is extraordinarily wasteful in terms of time consumption.

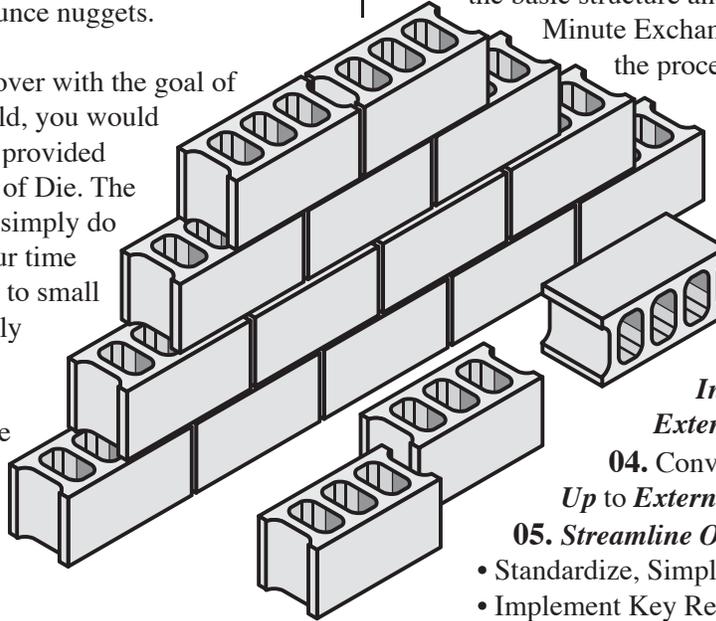
When we build a house from concrete blocks, each block is insignificant in terms of the finished home, but by adding one block to the next, we gradually build impressive structures. Every minute is like a building block in a race to construct an effective make-ready structure, everyone is important, and everyone contributes to the whole.

The message of Single Minute Exchange of Die is simple. When we make every second count and every minute count, the hours will take care of themselves.

Single Minute Exchange of Die concentrates on saving seconds and minutes, because each one is a building block of time, and each one saved contributes to the finished structure. In SMED our first step requires finding out what we are currently doing in press make-ready.

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

Before we even begin to look at solutions, let us examine the basic structure and the principles of Single Minute Exchange of Die. The basic steps in the process include:



01. Utilize Semi-Autonomous Work Teams.
02. Focus upon Activity Time, Elapsed Time and Speed of Execution as Key Measurements.
03. Distinguish between *Internal (On-Press) Set-Up* & *External (Off-Press) Set-Up*.
04. Convert *Internal (On-Press) Set-Up* to *External (Off-Press) Set-Up*.
05. *Streamline On-Press (Internal) Set-Up*.

- Standardize, Simplify & Streamline.
- Implement Key Result Analysis.
- Develop Just-In-Time Work Areas.
- Implement One-Touch Processing.
- Format the Press & the Equipment.
- Implement Parallel Processing.
- Implement Work Planning.
- Close the Loop on every cycle.

06. *Streamline External (Off-Press/Pre-Press) Set-Up*.

- Standardize, Simplify & Streamline.
- Implement Key Result Analysis.
- Develop Just-In-Time Work Areas.
- Implement One-Touch Processing.
- Format the Press & the Equipment.
- Implement Parallel Processing.
- Implement Work Planning.
- Close the Loop on every cycle.

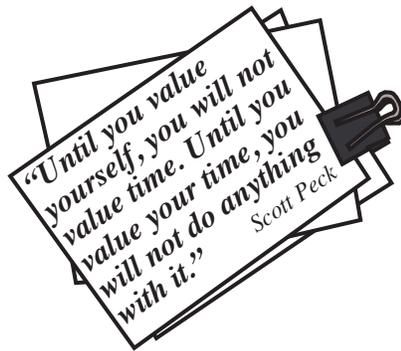
07. Create checklists, visual guides, and job aids.

08. Videotape Key Activities/Procedures.

09. Isolate one activity every changeover cycle, measure, brainstorm, discuss and revise.

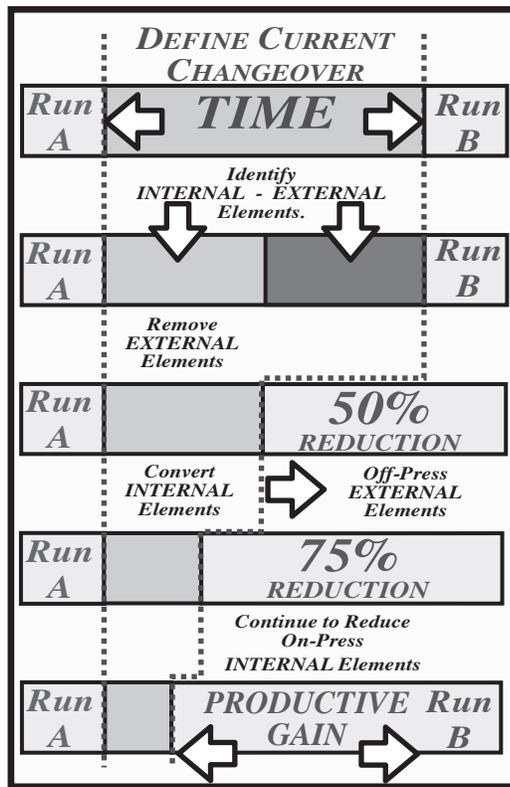
10. Upgrade methods, practices, organization and procedures, and begin the process again!

As you can see this is a series of simple, straightforward and common sense activities, which when executed precisely and consistently, will generate progressive improvement from one changeover cycle to the next.



The diagram to the right shows the results many companies experience, and the speed of progress is directly dependent upon the intensity of the focus, and the quality of the teamwork applied to the SMED program.

Changeover is defined in the diagram as the difference between production run A and production run B. The next step requires examining the changeover process and determining what are Internal Elements and External Elements. The next step assumes we have removed all of the external elements, showing an average of a 50% reduction in changeover. (Remember, this is not an instant pudding, it will take time, and the time taken will be a reflection of the effort you and the work teams make in the SMED improvement process.)



→ **Production**

We have managed to delude ourselves, with an approach to diecutting productivity, which makes performance appear much better than it really is. After make-ready is complete and the production run has started, any stoppage must be classified as being back in make-ready. What happens when the press stops? We make adjustments to the press and make corrections or fine tune the tools. Which is exactly what we do in make-ready.

By allowing the classification of time as Lost Time or Down Time, we are actually avoiding facing the fact that the make-ready we just finished was not good enough for the press to run, without further

The next stage focuses on analyzing the remaining internal elements and converting them to external elements, which on average, demonstrates a 75% reduction in press make-ready time. The final stage requires analysis of the external elements, with the goal of refining and reducing the time and the work involved in these activities.

Of course the first question you will have is what Internal Activities can be taken off-press and converted into External Activity?

Before we address this subject there is a very important distinction to make about the process of running a diecutting press. We stated earlier that most industry professionals recognize there are three types of activity on press. These are:

- **Make-Ready**
- **Production**
- **Lost Time**

This is actually not correct, because there are only two types of activity on-press, which are:

- **Make-Ready**

tuning and adjustment. We have become complacent, and we allow the damaging practice of working on-tools on press as though it were normal, when in fact it simply means the tools were specified and designed incorrectly, the tools are too worn and damaged for effective diecutting, the tools were not made well enough, or the tools were installed incorrectly.

This has created a completely false reading of our productive ability. When we say the make-ready was 2 hours, and we subsequently experienced 3 hours of die time, the make-ready is actually 5 hours! This is the only honest way to look at our performance, and boy do we need to improve!

LOST TIME CLASSIFICATION

Lost diecutting press production time, other than the result of mechanical failure, should be measured, and classified as a continuation of press make-ready.

The graph shows two bars representing 'Lost Time' and 'Make Ready' over a series of 'JOBS'. The 'Lost Time' bar is shaded and extends from the end of the 'Make Ready' bar, indicating that lost time is a continuation of the make-ready period. Below the graph is an illustration of a diecutting press.

Examples of Internal On-Press Conversion to External On-Press Activity?

These activities could include:

- **Press Calibration**
- **Steel Rule Die Calibration**
- **Steel Rule Die Nicking**
- **Installation of Patch-Up Sheet**
- **Patch-Up Station Numbers**
- **Installation of Matrix on die**

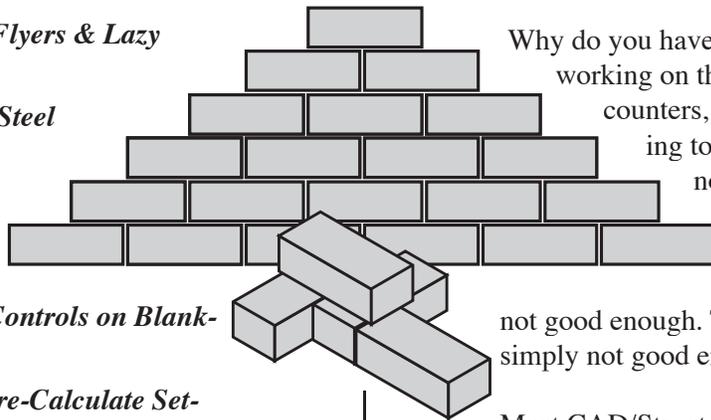
The ABC's of Fast Diecutting Press Changeover!

- Installation of Counters on die
- Pressure Calculation
- Preparation of Sheet Flyers & Lazy Fingers
- Pressure Balance the Steel Rule Die
- Installation of Sheet Controls on Stripping Tools
- Installation of Sheet Controls on Blanking Tools
- Format the Press & Pre-Calculate Settings
- More effective Tool Design & Specification
- Verify all tool converting parameters are pre-tested against the paperboard in use
- More effective Tool Machining & Fabrication
- A more effective tool verification and purge cycle.
- Progressive Tool Design in Stripping
- Progressive Tool Design in Blanking
- Aggressive Pre-Preparation program
- Just-In-Time Organization of Press Work Areas
- Press & Changeover System Inspection prior to Changeover
- Implement System Maintenance to ensure all press fittings, components, and equipment is in optimal position
- Thoroughly preview the job to ensure familiarity with product key features and critical design points
- Verification of Work-In-Progress and pre-positioning and proper sequencing of materials

This list represents some, but not all of the things we can do to remove on-press or Internal Activity, and convert them to off-press or External Activity. And although some of these specified actions may be controversial or they may be new concepts, they are painfully simple. So the bottom line is brutal.

For a significant number of changeover activities, if you simply

did what you do now, but did it off press, you could reduce most make-ready by 50% immediately.



Why do you have to spend so much time working on the steel rule, the matrix or counters, the stripping and the blanking tools? Is it because you are not competent or experienced enough to overcome the challenges press set-up requires, or are the tools just not good enough. The answer? The tools are simply not good enough? Why is this?

Most CAD/Structural Designers, and most Diemakers, have limited knowledge about the diecutting process, and yet they are the architects of success or failure. As an apprentice diemaker I started at 15 years of age in a folding carton factory, and endured my first

SINGLE MINUTE EXCHANGE OF DIE

The theory and practice of performing set-up, changeover, make-ready in under 10 minutes per male & female tool change.

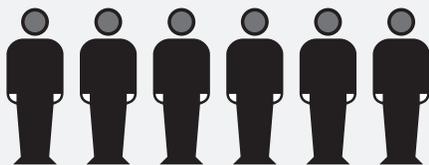
interview with my very aggressive new supervisor. He told me I would be spending three years in diecutting, before I could begin my diemaking apprenticeship! Seeing the look on my face he explained: *“Son, as 75% plus of press downtime has something to do with the steel rule die, how can you possible have the arrogance to even think of making a die, until you fully understand all the challenges of diecutting?”*

Little did I know he made the same practiced speed to the other victim starting at the same time as a Diecutting

Apprentice. I was told it went something like this. *“Son, as 75% plus of press downtime has something to do with the steel rule die, how can you possible have the arrogance to even think of running a press, until you fully understand all the challenges of diemaking?”*

This made good sense then and it makes even more sense today. Therefore, at least once per month, and preferably once per week, the changeover teams we will describe in a later section, should include the team players shown in the illustration. Can

TEAM PLAYERS



**TOOL DESIGNER
DIEMAKER
PRE-PRESS
PRESS OPERATOR
UTILITY MEMBER
GUEST (SUPPLIER)**

MAKE-READY ANALYSIS : 49" - 1260 Bobst Press			
STEP	TASK DESCRIPTION	ACTIVITY TIME	ELAPSED TIME
1	Set Interior Gate		
2	Positioning & Skiving of Matrix		
3	Feed Table Set-Up		
4	Strike In Job		
5	Cutting Set-Up		
6	Remove old Stripping Tool Set		
7	Installation of Lower Stripping Tool		
8	Delivery Set-Up & Stripper Light		
9	Installation of Upper Stripping Tool		
10	Placement of Bottom Pins & Breaks		
11	Final Check Steps 01 thru 10		
12			

foundation and as a support, and it helps the one above to stabilize and to gain strength and structural stiffness. We need to analyze the process to see what is happening, to find out where we expend the greatest time consumption, and to unify and benchmark our current approach to press set-up.

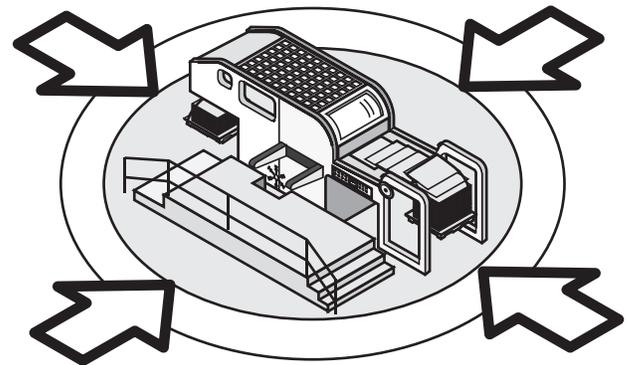
In this logical step-by-step process, or brick-by-brick construction of an effective system of press changeover, the tool we use to analyze current activity is a variation on the Key Result Analysis system discussed in an earlier section.

The KRA form to the left has a similar construction and features to some of the forms we illustrated in the Systems of Measurement Section.

Starting from the left, there is a column for the sequence and the order in which each step is executed. The next column contains the names or a description of each step. The next column is broken down into 16 x 5 minute cells, for a potential total of eighty minutes next to each step. This is for recording Activity Time, or the amount of time expended on each step.

you possibly believe ignorance of the details of diecutting can make you a professional diemaker. Of course not. This is a not a logical statement, but it is an illogical problem, undermining diecutting performance throughout the industry!

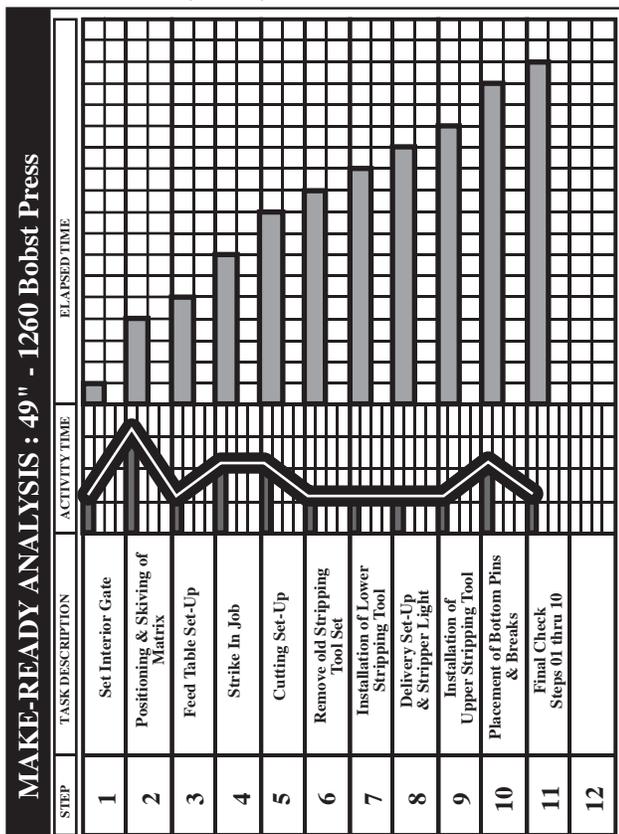
Now back to Single Minute Exchange of Die. Just like building a wall, you start at the bottom and work your way up. And just like the wall, there are no unimportant bricks, and every one you add uses the one below as a



The final column is divided into 36 x 15 minute cells for a total of 9 hours. This column is for recording Elapsed Time, or the accumulated Activity Time from each step in the process.

This form has been used to record the first level of make-ready analysis for a 49" or 1260 Bobst Press. This basic analysis is relatively simple, however it does represent a consensus of the work team in this organization. In spite of the final simplicity, it took 4 meetings to get everyone to agree upon the final sequence of activity. Then we conducted 5 make-ready analysis and averaged out the time consumed on each activity to give the form you see.

If the completed form is rotated through 90 degrees, the Activity column find a very clear indication that the



The ABC's of Fast Diecutting Press Changeover!

majority of time was expended in positioning & skiving matrix. The next obvious step is to investigate and to complete an analysis of the selection, the installation and the preparation of matrix. However, this is a perfect example of converting an Internal Activity to an off-press External Activity. When the management team calculated the cost of this activity, they changed their matrix distributor and selected a more expensive brand, however, one which had a broader adhesive base, a built in sheet flow ramp, a better matrix cutting tool, and one which required minimal skiving to eliminate product marking.

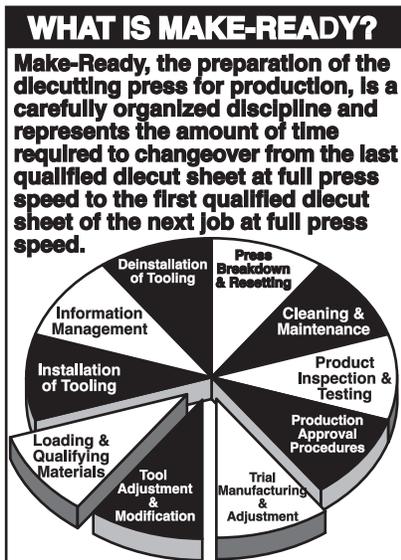
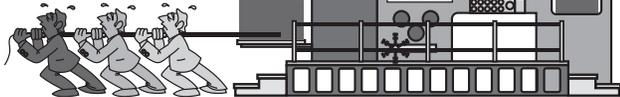
Time on press was significantly reduced, and the additional cost of the improved matrix was more than made up by the savings in make-ready time, and the gain from faster processing and greater throughput.

The Single Minute Exchange of Die incorporates a number of key disciplines, some of which we have covered in earlier sections. These would include:

- *Workplace Safety (Always Number One!)*
- *Training & Skill Development*
- *Standardize & Benchmark*
- *Information Management*
- *Time Management*
- *Measurement Systems*
- *Just-In-Time Organization*

As we move forward we will expand the discipline by addressing *Simplification, Inventory Management, Tool-making & Pre-Press Organization* and of course *Team Changeover*.

SLOW MAKE-READY



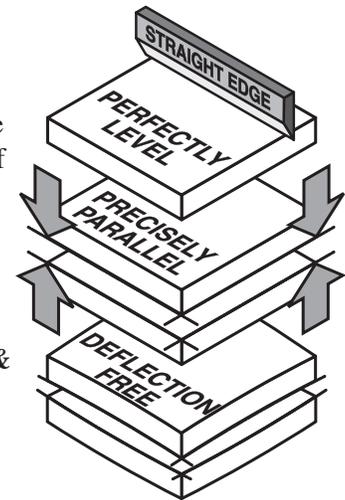
Team Changeover is most effective when based upon a NASCAR Pit Crew Changeover, and outlining these choices will define and expand upon another SMED discipline, Parallel Processing. However, an important part of SMED is One Touch Processing. This is the concept of striving to only touch a tool once during installation and deinstallation; one touch adjustment, such as pressure setting; and one touch setting, which could relate to setting the controls on the feeder, for example.

How do we incorporate this concept into diecutting?

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

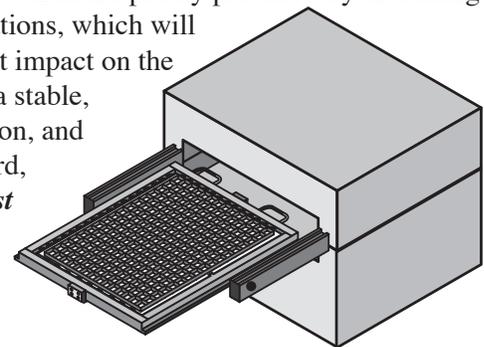
In diecutting, when we examine press make-ready, two key disciplines consume a disproportionate amount of changeover time. These are:

- *Tool Adjustment & Modification*
- *Trial Manufacturing & Adjustment*



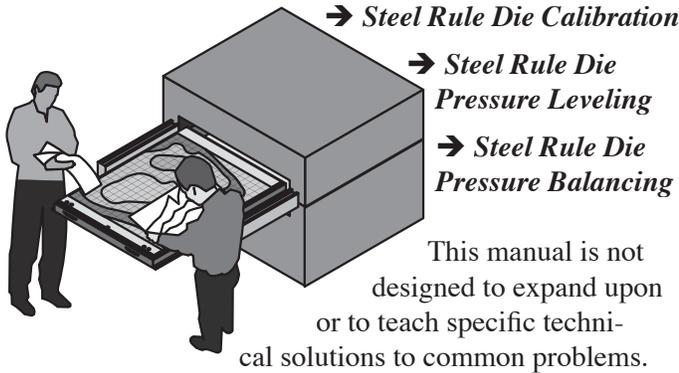
In practice, a large proportion of the time consumed is absorbed by getting a 100% kiss-cut make-ready, and generating a stable cutting impression, which will minimize or even eliminate production stoppages to add more patch-up tape!

What are the important actions we could take to get this activity as close to a one touch process as possible. There are 5 disciplines, which are poorly practiced by diecutting converting operations, which will have a significant impact on the speed of setting a stable, kiss cut impression, and in working toward, "Selling the First Impression."



These are:

- *Press Calibration*
- *Pressure Management & Calculation*

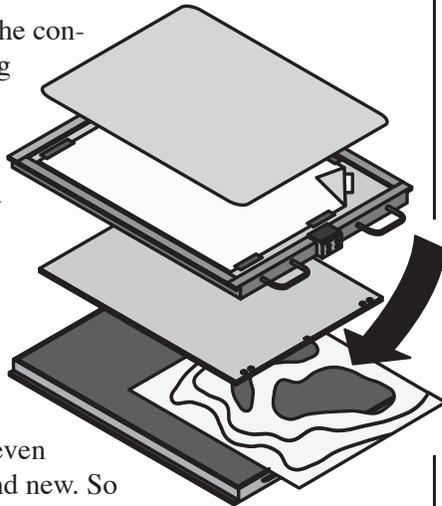


This manual is not designed to expand upon or to teach specific technical solutions to common problems.

But if you apply all of these basic and simple foundation principles of effective press preparation and steel rule die calibration, you will see extraordinary improvement.

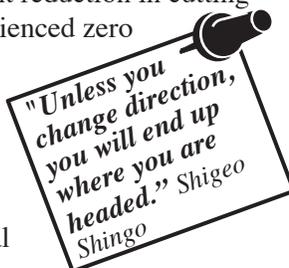
However, let us examine one of these disciplines in more detail. Press Calibration.

We invest heavily in the concept that the diecutting press critical tool mounting and cutting surfaces are perfectly flat, they are precisely parallel, and they are resistant to any form of deflection under load. *See left.* This is impossible from an engineering and from a scientific standard, even when the press is brand new. So how do we measure and compensate for the potential variation?

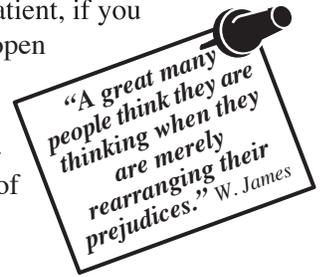


To Map the Press and measure the variation we need to make a full size *“Grid-Mapping-Die”*, *see left*, and carefully measure and map the degree of variation. This activity generates a *“Pressure Distribution or Pressure Imbalance Pattern.”* *See top of column.* This pattern enables the creation of a multi-layered foil, compensation underlay, which is inserted under the cutting plate. *See above.* This is certainly a short and brief overview of the Press Calibration, but many of the companies who practice this discipline show significant reduction in cutting make-ready, and some have experienced zero patch-up!

It would be natural to assume, given the apparent complexity of the diecutting process, that One-Touch Processing is an impractical



concept, however, if you are patient, if you persevere, and if you have an open mind you will discover more and more ways in which this principle can be effectively applied to many of the activities of press changeover.

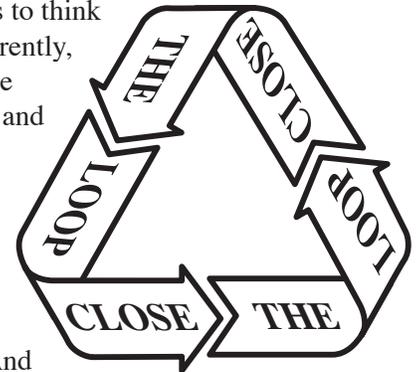


This technique is a powerful example at seeking one-touch processing in diecutting, and like so many other missing disciplines, it is driven by the SMED analysis of thinking in different ways!

The Goals of Single Minute Exchange of Die

“Have a time and place for everything, and do everything in its time and place, and you will not only accomplish more, but have far more leisure than those who are always hurrying.” ~Tyron Edwards

This entire manual is about Single Minute Exchange of Die or SMED, and every section it contains has elements of the SMED discipline integrated into the recommended methods and practices. The goals of Single Minute Exchange of Die are clearly defined by the title of the discipline, however, the broader challenge of this focus on press changeover is to think laterally, to think differently, and to think outside the constraints of tradition and current methods.



We know the current system of changeover is less than effective, or you would not be reading this manual. And that is another way of saying, the way we plan, the way we organize and the way we execute tasks, needs radical change to overcome the current technical and organizational bottle necks. Change requires reassessment, re-thinking, and considering alternative methods and technical options.

The key challenge from our current approach to thinking and to development of alternatives, is we are not very effective at teamwork, team building, brainstorming and discussion. We dislike meetings because they are generally poorly organized and managed, or they are confrontational or eerily quiet and uninspiring! The importance of holding effective meetings and brainstorming sessions

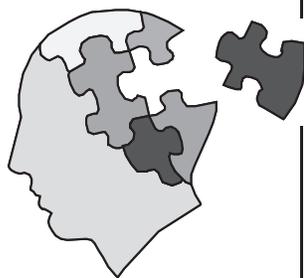
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is if we could capture all of the knowledge, all of the experience, and all of the intellectual fire power inherent in any group of people, then ideas would flow, discussion would be stimulating and productive, and new and better ways to do things would rapidly emerge. We have the ability to change everything, the only obstacle we face is our ability to imagine a different future.

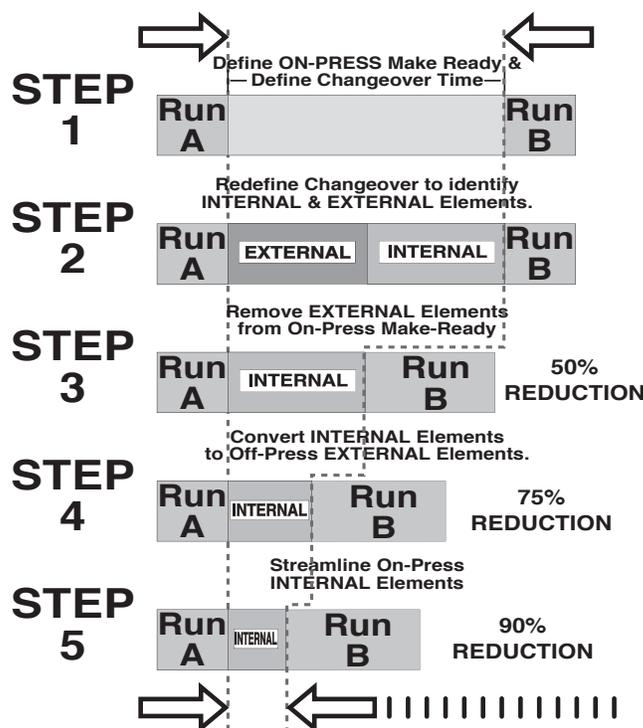
The final thought on SMED goals is it is vital to commit to a willingness to lead and/or a willingness to accept leadership. When we create teams we need team leaders, we need team members, and we need team activists. Diecutting technicians currently operate like independent contractors who participate in the diecutting enterprise, often on their own terms and with clear lines of demarcation. Now more than ever our future lies in a willingness to work with others, to be patient and respectful of your colleagues, to appreciate and to praise their efforts, and to accept their ideas and suggestions, as they accept your ideas and suggestions.

To summarize the goals of Single Minute Exchange of Die:

- *To think differently and constructively, and to encourage others to voice their ideas and opinions.*
- *To be positively skeptical, but to have an open mind, and to try new techniques or practices before reaching conclusions.*
- *To communicate openly and honestly, and to listen with intensity and enthusiasm.*
- *To work in teams, as both a leader and as a team member.*



Obviously, SMED is directed at Fast Press Changeover, but if you ignore all of the underpinnings of progressive change, the journey will be rocky, and the destination



uncertain.

Single Minute Exchange of Die:

Methods & Practices

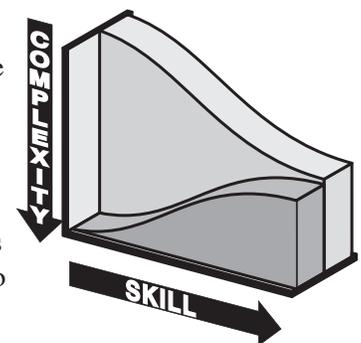
"We must use time as a tool, not as a crutch."

~John F. Kennedy

Single Minute Exchange of Die has key basic tenants of the discipline at its core. However, the methods and practices used to achieve these requirements will vary from company to company. The basic steps in the process include:

01. Utilize Teams & Teamwork.
02. Focus upon Activity Time & Elapsed Time.
03. Distinguish between *Internal (On-Press) Set-Up* & *External (Off-Press) Set-Up*.
04. Convert *Internal (On-Press) Set-Up* to *External (Off-Press) Set-Up*.
05. *Streamline On-Press (Internal) Set-Up*.
06. *Streamline External (Off-Press/Pre-Press) Set-Up*.
07. Create checklists, visual guides, and job aids.
08. Videotape Key Activities/Procedures.
09. Attack one activity every changeover cycle.
10. Upgrade methods, and begin again!

Although any and all of the disciplines covered in the various sections require an intense focus at the beginning, and certainly will initially complicate existing practices and procedures, it is important to recognize and remember as we are developing and implementing new procedures, that our goal must be to improve knowledge and skill, but at the same time to lower complexity and make it easier to master the new methods. In a number of ways Single Minute Exchange of Die is about simplification and a reduction in complexity, and this is one of the reasons it is so successful.



**Single Minute Exchange of Die:
The Benefits of Change**

“Learn to use ten minutes intelligently. It will pay you huge dividends.” ~William A. Irwin

One of the key benefits of adopting Single Minute Exchange of Die, is outlined in the quotation above. SMED focuses our attention on Activity Time, Elapsed Time, and the consumption of time. But it is by working with minutes and seconds, where we currently think in terms of hours and days. Therefore, the first benefit of SMED is in practicing and developing our skills at this technique, we gain a more accurate and a more disciplined approach to the value of time, even when the increments seem small and insignificant.



process improvement discipline is co-operation. Diecutting is a toolmaking process. The press is merely a toolholder, and converting happens when an upper and lower tool sandwich a substrate and transform it into a component or a product of higher value. The diecutter does not control tool design and fabrication, but the CAD/Structural Design Team, the Diemaking/Toolmaking Team, and the Pre-Press Team do! Therefore, we are not going to achieve fast tool changeover unless these key players in the Customer-Supplier Chain are actively involved in the project.

The fifth benefit of SMED is training. The diecutting converting industry is not very effective or honest about training. We talk and talk and talk, and either ignore the

PARETO PRINCIPLE

This process is statistically based on determining in diecutting for example, that approximately 80 percent of the trouble comes from 20 percent of the problems. This 80-20 rule can be applied to many areas of the business. For example in sales it is not unusual to find that twenty percent of the customers account for eighty percent of the business.

The second important benefit is to implement SMED effectively we must stabilize, standardize and streamline the changeover and the diecutting process. The three words or activities, stabilize, standardize, and streamline, have important implications in terms of the way we work. In adopting these disciplines, teamwork is the first obstacle to overcome; developing a consensus approach is the next; developing a benchmark starting point and then applying increasingly improved benchmark performance is the next; and then attacking the standard operating procedure by standardizing and simplifying the work areas.

The third benefit of SMED is the focus on teamwork, and team building and on working together, in an entirely different and a more cooperative manner. The majority of diecutting operations talk and discuss teamwork endlessly, but are in reality as far from a team driven environment as you can find in manufacturing. SMED is based upon a cooperative involvement of as many people as possible, to ensure we can focus every idea, suggestion, and innovation on the problem at hand, and in the shortest time possible.

The fourth benefit of adopting the SMED

PARETO BENEFITS

The Pareto diagram helps you to sort out the few really important problems from the more numerous but less important problems. In the Diecutting Key Result Analysis System (KRA) the use of the pareto techniques will help to highlight the most critical diecutting problems where the focus of improvement is needed. In addition, continued charting will graphically demonstrate the results of change and show a positive or negative impact on performance.

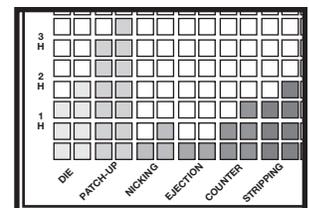
knowledge and uniformity of applied skill. As we re-engineer current procedures and practices, the Training Map we discussed in an earlier section becomes a vital and an essential management tool in stabilizing performance ability across the team.

The final benefit of SMED is Self Esteem. In every implementation of this program, many of the best ideas and the most creative solutions come from the quietest members of the existing team, and also from the least experienced members of the team. The application of time management to the current process, and the inevitably reworking of basic methods and procedures, levels the playing field and pulls everyone into the discussion on a more equal basis. In implementing SMED we are in practice stabilizing the workforce by creating an equality of knowledge of skill and of experience.

PARETO ANALYSIS

The Pareto Chart or diagram was named after the Italian economist Vilfredo Pareto (1848-1923) who developed a method of arranging problem causes by their relative importance. The diagrams are often referred to as the basis for the concept the “vital few” and the “trivial many” in problem analysis.

Single Minute Exchange of Die is a revolutionary method of rapidly and fundamentally transforming the diecutting manufacturing process. If it is implemented honestly and pur-



The ABC's of Fast Diecutting Press Changeover!

sued with determination, the benefits and the rewards to everyone involved are significant, as we can only succeed as a team.

Single Minute Exchange of Die:

Recommended Actions

“Time is an equal opportunity employer. Each human being has exactly the same number of hours and minutes every day. Rich people can't buy more hours. Scientists can't invent new minutes. And you can't save time to spend it on another day. Even so, time is amazingly fair and forgiving. No matter how much time you've wasted in the past, you still have an entire tomorrow. Success depends upon using it wisely--by planning and setting priorities.” ~Dennis Waitely

There are many ways to approach Single Minute Exchange of Die to be effective, with the most important action being persistence in the face of opposition or of perceived difficulty! The summary of actions would include:

- 01.** Utilize Semi-Autonomous Work Teams.
- 02.** Focus upon Activity Time, Elapsed Time and Speed of Execution as Key Measurements.
- 03.** Distinguish between *Internal (On-Press) Set-Up* & *External (Off-Press) Set-Up*.
- 04.** Convert *Internal (On-Press) Set-Up* to

DEFINE CURRENT BENCHMARKS

Define current benchmark standards?

(Where are you NOW?)

Define new system benchmark standards?

(Where are you GOING?)

Determine personnel & organization changes necessary to optimize the new methods?

(How will you get THERE?)

External (Off-Press) Set-Up.

05. Streamline On-Press (Internal) Set-Up.

- Standardize, Simplify & Streamline.
- Implement Key Result Analysis.
- Develop Just-In-Time Work Areas.
- Implement One-Touch Processing.
- Format the Press & the Equipment.
- Implement Parallel Processing.
- Implement Work Planning.
- Close the Loop on every cycle.

06. Streamline External (Off-Press/Pre-Press) Set-Up.

- Standardize, Simplify & Streamline.
- Implement Key Result Analysis.
- Develop Just-In-Time Work Areas.
- Implement One-Touch Processing.
- Format the Press & the Equipment.
- Implement Parallel Processing.
- Implement Work Planning.
- Close the Loop on every cycle.

07. Create checklists, visual guides, and job aids.

08. Videotape Key Activities/Procedures.

09. Isolate one activity every changeover cycle, measure, brainstorm, discuss and revise.

10. Upgrade methods, practices, organization and procedures, and begin the process again!

We also defined some key goals, however, they are equally effective when designated as actions!

- ***To think differently and constructively, and to encourage others to voice their ideas and opinions.***
- ***To be positively skeptical, but to have an open mind, and to try new techniques or practices before reaching conclusions.***
- ***To communicate openly and honestly, and to listen with intensity and enthusiasm.***
- ***To work in teams, as both a leader and as a team member.***

In terms of forming a plan of action for Single Minute Exchange of Die it is important to recognize SMED incorporates a number of key disciplines, covered in earlier sections. These would include:

- ***Workplace Safety (Always Number One!)***
- ***Training & Skill Development***
- ***Standardize & Benchmark***
- ***Information Management***
- ***Time Management***
- ***Measurement Systems***
- ***Just-In-Time Organization***

As we move forward we will expand the discipline by addressing ***Simplification, Inventory Management, Toolmaking & Pre-Press Organization*** and of course

Section Thirteen:

Single Minute Exchange of Die (SMED): Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ **Single Minute Exchange of Die (SMED)** is one of the most successful lean production methods for reducing waste in a manufacturing process. It provides a rapid and efficient way of changing over a manufacturing process from running the current production run to running the next production run. It is also often referred to as Quick Changeover. It is a concept that says all changeovers can and should take less than 10 minutes ... hence the phrase Single Minute. Closely associated is an advanced concept of **“One-Touch Exchange of Die”**, which says changeovers can and should take less than 100 seconds for each tool set.
- ✓ One of the reasons the world wide success of Single Minute Exchange of Die has not enabled it to more fully penetrate the Converting Industry in the US, is SMED is built around and depends upon other consistently applied organizational disciplines being in place. These would include standardization; procedurally based training and education; time management, Benchmarking and Just-In-Time organization; information and inventory management, and process simplification and process measurement.
- ✓ The first step in SMED is in implementing standardized methods of executing key tasks. While everyone accepts the concept of procedural uniformity, it is difficult for each individual to modify and to accept a method of working which represents the consensus of the entire work team, and is differences to the way they have been working for many years.
- ✓ The second important discipline in SMED is Parallel Processing. This simply means attacking changeover using a team approach, and that two or three changeover activities are happening simultaneously. The challenge here is working as a team, working safely and cooperatively, and communi-

cating, discussing and resolving inevitable disputes or disagreements amicably. It is important they realize team building is a process to, and where we begin and where we end are two different places. It is important to bolster the team effort as this is the cornerstone of our future in diecutting converting.

- ✓ **There are Ten basic steps in the SMED system:**
 01. Utilize Teams & Teamwork.
 02. Focus upon Activity Time & Elapsed Time.
 03. Distinguish between **Internal (On-Press) Set-Up & External (Off-Press) Set-Up.**
 04. Convert **Internal (On-Press) Set-Up to External (Off-Press) Set-Up.**
 05. **Streamline On-Press (Internal) Set-Up.**
 06. **Streamline External (Off-Press/Pre-Press) Set-Up.**
 07. Create checklists, visual guides, and job aids.
 08. Videotape Key Activities/Procedures.
 09. Attack one activity every changeover cycle.
 10. Upgrade methods, and begin again!
- ✓ To summarize the goals of Single Minute Exchange of Die:
 - ➔ **To think differently and constructively, and to encourage others to voice their ideas and opinions.**
 - ➔ **To be positively skeptical, but to have an open mind, and to try new techniques or practices before reaching conclusions.**
 - ➔ **To communicate openly and honestly, and to listen with intensity and enthusiasm.**
 - ➔ **To work in teams, as both a leader and as a team member.**
- ✓ SMED incorporates a number of key disciplines, covered in earlier sections. These would include:
 - ➔ **Workplace Safety (Always Number One!)**
 - ➔ **Training & Skill Development**
 - ➔ **Standardize & Benchmark**
 - ➔ **Information Management**
 - ➔ **Time Management**
 - ➔ **Measurement Systems**
 - ➔ **Just-In-Time Organization**

Section Thirteen:

Single Minute Exchange of Die (SMED): Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ What does SMED stand for, and how would you explain the discipline?
- ✓ Why is SHigeo Shingo and what was his profession?
- ✓ What is the difference between Internal & External Activity during press changeover?
- ✓ What does “One-Touch Processing” mean?
- ✓ What does “Parallel Processing” mean?
- ✓ What are the Four Goals for Improvement?
- ✓ Why is Teamwork so important in the implementation of SMED?
- ✓ Define two or three ways in which we could convert Internal On-Press Activity to External Off Press Activity?
- ✓ How does Key Result Analysis factor into the SMED discipline?
- ✓ What are the three commonly perceived activity on-press, and how should they be more

accurately identified?

- ✓ Provide three examples of current Internal Press Activity we could immediately convert to External Press Activity?
- ✓ What is the statistical reason toolmaking or diemaking is so important in platen diecutting?
- ✓ In an effort to improve the performance attributes of the tools, which should be regularly involved in press changeover?
- ✓ What is the base unit of time used in Time & Motion and Just-In-Time organization?
- ✓ Why is it important to implement Press Calibration as a SMED discipline?
- ✓ Name two of the four goals of SMED specific in this section?
- ✓ How do you see videotaping changeover as a help in implementing SMED?
- ✓ Why is a focus upon time measurement such an important feature of the SMED discipline?
- ✓ How does training and skill development fit into the SMED discipline?
- ✓ What is Pareto Analysis?
- ✓ How does Pareto Analysis work?

Manufacturing System of Organization

Section 14: Inventory Management

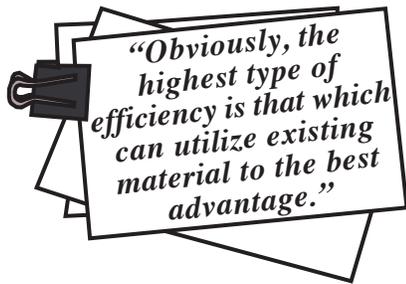
Key Definitions: ... *Inventory Management and Control* refers to the provision of all resources necessary for completing manufacturing activities, and their flow in the right quantity, at the right time, and in the right place ... *inventory control* is the management of everything required, but nothing more, to complete a activity or a series of activities in manufacturing

The Inventory Management Statement: "It is the mission of the work team to develop a lean manufacturing operation in which inventory control and management disciplines are used to minimize waste of inventory, of materials, of space, of time, of transportation, of over-production, of defects, of labor, of money, and of resource waste."

Inventory Management: An Overview

"Nothing is particularly hard if you divide it into small jobs." ~Henry Ford

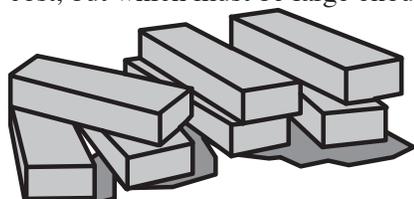
There are many different materials, tools, components, parts, supplies, information, and work-in-process re-



sources required to complete each step in the manufacturing process. These activities could include ruling a steel rule dieboard, it could be locking the die in the chase, it could

be rubbering the die, it could be nicking a die, it could be taking an impression, and it could be patching up the job to achieve a kiss cut impression.

Everyone of these activities requires tools and equipment, materials and supplies, parts and components, and information to complete the specific task. Every one of these resources is either permanently located at the site of the activity; or it is temporarily delivered to the site of the activity, and is returned to a dedicated storage location; or it is a consumable resource, which must be replenished as it is used; or it is work-in-process, which is transformed by the activity; or it is product and waste, which must be managed and delivered to the correct location; or it is information, which is required to guide the activity, and information, which is generated by the activity, which must be managed and delivered to the correct location; it is the space itself, which must be minimized to reduced cost, but which must be large enough to accommodate



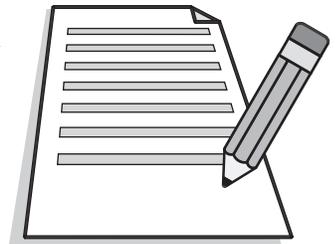
the safe execution of the activity; and it is the integration with the internal and external customer-

supplier chain to coordinate the delivery of everything needed to execute each task in a lean and an efficient manner.



The goal is to be able to complete a specific diecutting-converting task with minimal preparation time, and with movement from and around the activity to access tools and materials and information and resources.

For example, if it became necessary to add nicks to a die on-press, how would inventory management and control impact this activity?



As nicking the die is a common on-press activity, the nick grinder, and a complete inventory of wheels, nicking device tools, safety glasses, and an extension power cord or an air line, depending upon the type of grinder, should be stored in a retractable overhead tool rack, or in a shadow box, mounted on the face of the press or in the immediate proximity of the platen well.

As this activity will probably require the removal and repositioning of ejection material, we also need pliers to remove the rubber, a scraper to clean the dieboard surface, a supply of different ejection materials, a cutting tool to cut the rubber to size, the correct adhesive based upon the type of rubber, and a method of replenishing all of the consumable items as they are used!



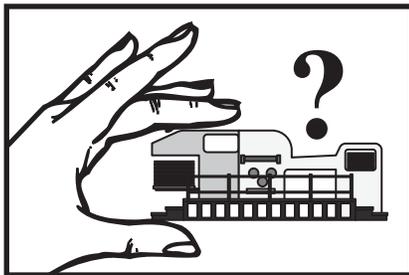
Inventory management and control is not only making sure you have everything

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

How have we managed to avoid the impact of time management in diecutting for so long? This is an interesting question, as almost any well organized process improvement program has to grapple with standardization, procedural uniformity, and benchmarking. Clearly, the target has shifted and the performance bar has been raised by several rungs in the past decade. This simply means current performance standards are outdated, and the methods and practices used to execute key activities has and is being superseded by better, faster, and simpler methods.

"We must not, in trying to think about how we can make a big difference, ignore the small daily differences we can make which, over time, add up to big differences that we often cannot foresee."

Marian Wright Edelman



Unfortunately, the threat level from national competitors and from an ever expanding global competition has changed the ball game, particularly

in terms of pricing. But this in itself does not explain our complacency or our lack of urgency?

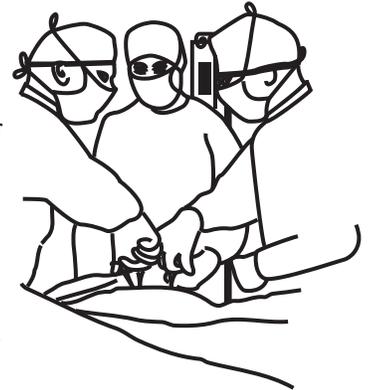
We have repeatedly defined the first stages of any process improvement program is to stabilize, to standardize and to streamline. If any of these activities were applied to diecutting converting in a disciplined fashion, particularly standardization, it is difficult to see how Time Management, Just-In-Time organization, and Inventory Control, would not command our attention? Therefore, the most logical explanation of our failure to accept the market challenge to faster, better, and cheaper, is we have simply not implemented or perhaps truly persisted in standardization of press changeover?

Perhaps Confucius explained it best, when he said; *"Real knowledge is to know the extent of one's ignorance."*



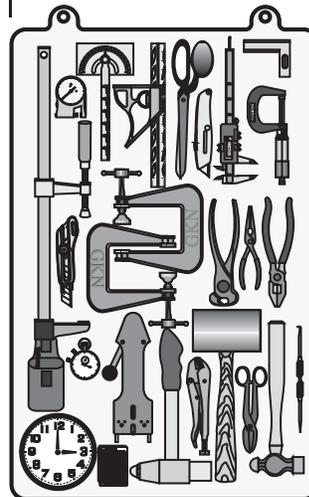
SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

The model for press changeover organization we described in an earlier section was the hospital emergency or operating room. We used the following description to define how the principles of Just-In-Time organization apply to this activity. However, when you read it this time, think in terms of all of the tools, materials, and supplies, which must be in place, and which must be replenished to keep this key area in optimal operating condition.



In this specialized environment, every single item is pre-determined and pre-checked; everything is in optimal condition; everything is

stored as close to the action as possible, without crowding the activity; everything is stored in the identical location it was stored in, as it was every other time the work area was used; every material, every supply, every tool, every piece of equipment, every piece of information, and every component, is stored in a predetermined location, and consistently applied location; everything that is needed is available and nothing that is



not needed, the area is as compact as possible, but not so compact as to inhibit the activity; at the end of every cycle, the work area is purged, restocked, and prepared for the next emergency; during the activity the work area is restricted with only essential personnel admitted; every team player has a designated role and a designated position during the activity; and every team player understands the sequence of events and is ready on cue to provide the technical assistance required.

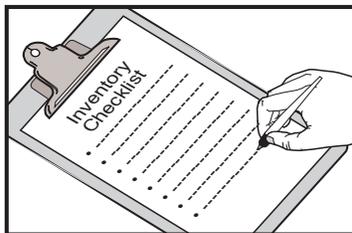
Each participant became a member of this elite team after extensive training and education. Is this the same as press changeover? You may disagree, but in principle

The ABC's of Fast Diecutting Press Changeover!

the only difference is the activity, the tools, and the skills being applied. The principles and the practices of how this room or work area is organized is identical to the principles and practices used to organize fast press changeover. And this approach is identical to our inventory management requirements to make sure everything is where it is needed and when it is needed.



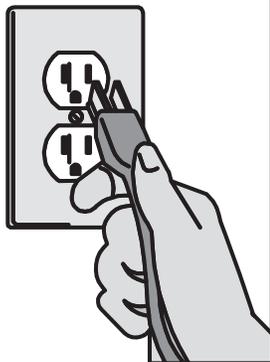
- The first step in any new project must be to get the entire work team together to describe the project, to outline the potential benefits of the change, to discuss the obstacles and challenges, and to brainstorm methods and practices for starting the project.
- The work team should adopt the description of the Hospital Emergency Room as the model for the reorganization of key on-press and off-press areas of activity.



- The work team should define the work areas or activity centers on press. These will include the operator side of the press, the off-lay or gear side of the press, the end of the feeder and the end of the delivery. In addition, we must include the underside of a unit and the inside of a press unit. These work areas could include:

- * The Press Feeder
- * The Press Feedboard
- * The Platen Stack
- * The Platen Well
- * The Stripping Unit
- * The Blanking Unit
- * The Delivery
- * The Waste Extraction System

- The next step is to prioritize these work areas or work cells for Inventory Control preparation. My suggestion would be to begin at the Platen Stack or Diecutting Section as this is where the majority of work takes place.



- With the specific work cell selected, the organization

of the work area can begin. This requires listing everything required to complete the activity, and without leaving the work area. This would include:

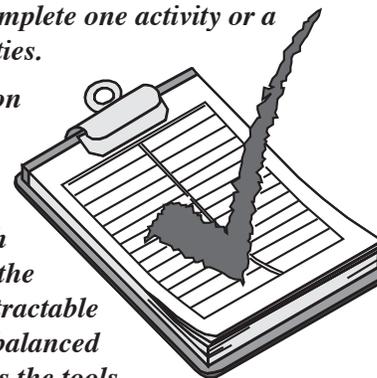
- * Job Information & Storage
- * All Hand Tools
- * All Power Tools
- * All Power Outlets
- * All Air Outlets
- * All Converting Tools
- * All Materials
- * All Supplies
- * All Parts & Components
- * All Equipment
- * All Safety Gear
- * All Maintenance Equipment
- * All Maintenance Supplies
- * Any First Aid Supplies
- * Work-In-Progress Storage



- Every component listed above must be given an identification number, and a permanent or a temporary on-press storage location.

- The storage location could be a single location shadow box, preferably color coded, which is mounted on the face of the press, or if it is a temporary tool it would be mounted on a mobile tool module which has color coded, single location shadow boxes, to hold temporary tool and material required to complete one activity or a sequence of activities.

- The storage location could be a single location Shadow Box, preferably color coded, which is mounted above the work area on a retractable overhead counterbalanced gantry. This allows the tools to be accessed and replaced instantly. However, when not in use the gantry can be locked in the retracted position.

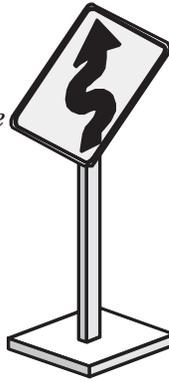


- Some of the materials and supplies are consumable items, such as patch-up tape, carbon paper, grinding wheels, ejection material, and patch-up sheets, to specify a few. Some of these materials are kept on-press permanently, as they can be required at any time, however, some of the consumables are only required during a press

changeover. Therefore, all of the consumable items must be subjected to a post-process checklist immediately after each changeover to ensure they are always in optimal condition and in the correct quantity.

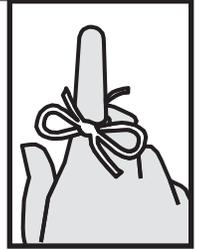
→ To manage the inventory control system, it is essential to create a series of checklists for each work area on-press, to be executed before the last production run is complete, to verify everything is in position for the next changeover.

→ It should be recognized, that until the final layout, organization, and placement of every tool, material, and component, it would be most effective to develop this inventory control system on a single press. This has the advantage of giving everyone time to assimilate the new ideas, and to react, and to add their comments and suggestions.

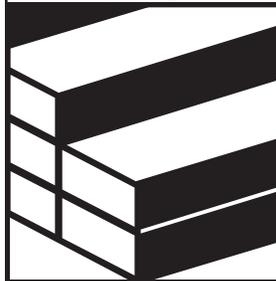


INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

It is obviously important to standardize the inventory control distribution of tools, materials, and components, to ensure everything is maintained in the approved positions, and to create a master blueprint to record changes and progressive upgrades to the system. To manage the layout:



→ The next step requires creating an accurate map of the press and the surrounding areas, particularly if these areas are involved in press changeover, or are used as staging areas for new and old tools. The map should be executed on graph paper, or directly programmed into a CAD System, using a scale such as 1/4" per foot.



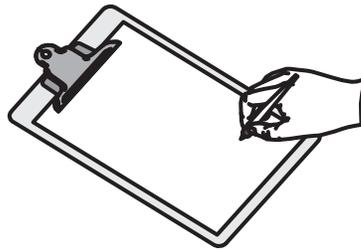
→ The next step requires using the map to position all of the tools, supplies and components, which will be used in make-ready.

→ The positioning of tools and materials is critical. Every step we take, every time we reach for a tool consumes the base time block of time management, 6 seconds. Also we defined transportation as one of the potential waste sources in manufacturing. Therefore, all of the tools, the materials, the components, and the parts must be positioned as close to where they will be used as possible.

→ Where necessary tools must be duplicated, and where possible fastened in position using a retractable, spring loaded wire or nylon hawser. This will ensure the tools are where they are needed, when they are needed, and it will be impossible to inadvertently remove a key tool from the work area.

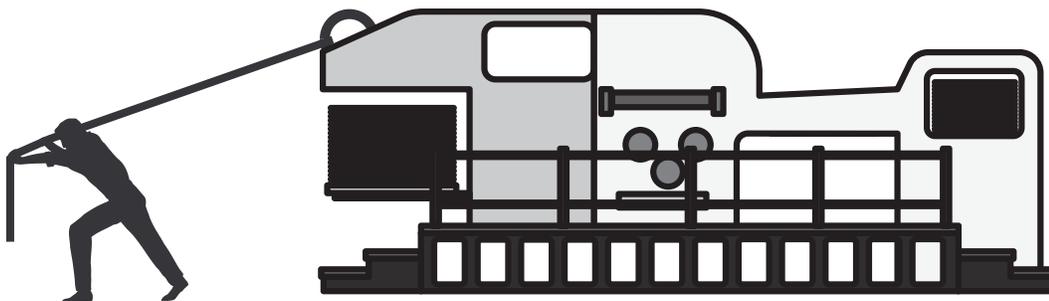
→ It is an advantage to pre-plan the pre-positioning of tools, equipment, materials and parts in each work area, however, it usually proves effective to implement the set-up over several changeovers. This is important

These organization principles and practices should be common sense. Just imagine you are a building roofer. How many times do you need to climb down and back-up, if all the tools you used and the roof tiles, were stored on the ground in-front of the house? Of course this does not make sense. Roofers have all their tools either in a tool belt or on a platform beside them on the roof as they work. In fact, the standard practice is to first pre-position all the stacks of roof tiles evenly across the roof, so there is minimal effort during roofing to get to everything they need.



INVENTORY

Diecutting is very similar. You have a task to complete on-press, and the inventory management and control checklists are simply there to make sure you have everything you need to complete the activity as fast as possible, as easy as possible, and in the least amount of time.



The ABC's of Fast Diecutting Press Changeover!

as planning on-paper is rather different to the actual process on-press. It will usually take several sessions to fully customize a work area.

→ It is also an advantage to work on one area, to minimize any potential disruption, and also to expedite the completion of one area. When the first area is complete, the next area can be started.

→ Naturally, when the Inventory Control organization of each work area is complete, the area should be mapped, on paper and on videotape, with every tool, every material, and every component position identified and marked. (In practice an area is never completely finished as progressive changeover cycles will reinforce the optimal layout and expose changes to improve utilization of the area.)



This is not a difficult concept nor is it a difficult project to organize, however, there is often a great deal of emotional attachment to the old ways of doing things. Even when existing methods have clearly failed to stay in touch with current commercial or technical standards. As with all

of these projects, the watch word is patience, followed by lots of communication and discussion!

The Goals of Inventory Management

"The organized person ... makes the most of his time and goes to bed for the night perfectly relaxed for rest and renewal." ~George Matthew Adams

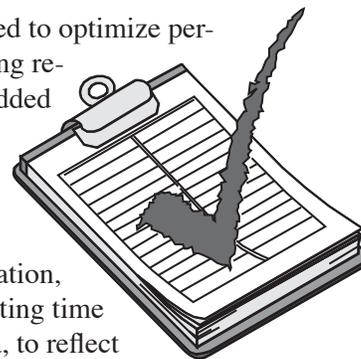
The primary goals of Inventory Management is to identify, to specify, to approve, to position, and to support the position of everything needed to complete each activity in diecutting converting, as safely, as quickly, as easily and at the lowest cost possible.

This system of organization is designed to improve performance by providing each team member with an identical workspace, in which everything required for the most effective and the most efficient execution

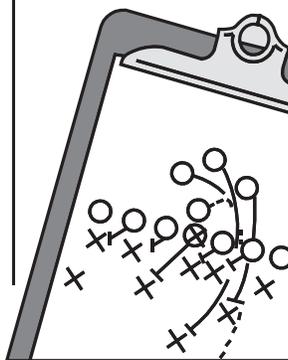


of each task, has been determined, approved, and stabilized with the participation of the entire team.

Each workspace is designed to optimize performance, while minimizing resource waste, non-value added time, and unnecessary motion. This is a work environment, in which each participant adapts to the work area and organization, rather than the person wasting time customizing the work area, to reflect their own knowledge and experience.



The system of inventory management and control represents all of the best ideas from all of the team members. The entire team will have cooperated in creating the original layout for each work area, and then by applying benchmarking and process postmortem, they will continually improve the system of manufacturing.



The system of inventory management and control is designed to reduce complexity, and to level the knowledge and the skill playing field. This is accomplished by making it as simple as possible to execute key tasks, and to customize work areas to eliminate variation and mistakes.

Simply stated, the inventory management and control system is designed to improve performance, while making each activity easier, less tiring, less stressful, and less complex.

Inventory Management: Methods & Practices

"The person who plans his day in advance goes about his work logically and efficiently. When there is no organization of schedule, there is no place to begin."

~Anonymous

There are multiple projects specified in this manual. Fortunately, Inventory Management & Control is one that can be simplified by selecting one press on which to implement the program, and by selecting one-press team to work on the project. Naturally, if the press is run two or three shifts, then the group would have to be expanded



"All organizations engage in the three basic activities of strategy, tactics, and logistics. Strategy defines the job. Tactics does the job. Logistics provide the resources to get the job done---not only material resources, but also manpower, materials, and data."
Robert L. Siegel

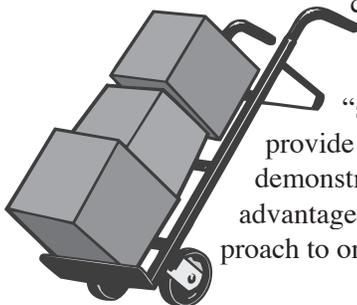
to include all of the press team members. By constraining the project to a small team the program can be implemented more quickly, with less time expended and at a lower cost. There are even some distinct advantages in this

approach.

As a single press can be customized, it can also be evaluated and improved quickly because with a limited number of participants, discussion, brainstorming and decision making will be accelerated. In addition, the system of on-press organization can be tested more quickly over fewer cycles and a provisional **"Version 1.00"** of the inventory control set-up can be established in a shorter period of time.

This version of the set-up can be field tested by other press crews or individual operators who swap over to conduct a number of press changeovers using the new system. The execution of each make-ready can be used by one or more members of the original press team to observe the actions of the transferred technician. This will allow them to capture his or her comments in real time, and they can complete a close-out at the end of each changeover cycle. This information is then evaluated and the on press organization of work areas upgraded and fine tuned to reflect the feedback. This trial run could be implemented with a number of press personnel, to ensure we maximize the experience of as many team members as possible.

When the team feel they has accomplished all it can, then benchmarking trials should be conducted between the customized press and an identical piece of equipment, which is still in the "standard" mode. This will provide more information and demonstrate to the entire team the advantages of an operating room approach to on-press organization.

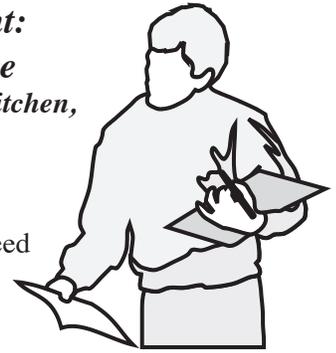


"Facts do not cease to exist because they are ignored."
Aldous Huxley

Inventory Management: The Benefits of Change

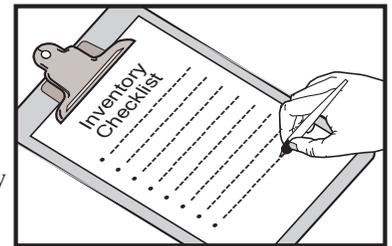
"If you can organize your kitchen, you can organize your life."

~Louis Parrish



To improve the process we need to bring together the entire team and generate a consensus about the best ways to do things and the best way to organize the process. This initial focus on stabilization, standardization, and streamlining, will help everyone to gain an understanding of the process of change and of the future they are facing.

The next step of getting everyone to perform the benchmark standard operating procedures in a consistent manner, even though they were all intimately involved and thoroughly consulted about each procedure, is the greatest challenge in the project. However, this essential discipline provides the greatest potential reward, because when we have everyone using the same methods and practices, it is easier to manage and to adjust the improvement process, and the re-training of every operator and technician to use the new procedures, is far less complex. Standardizing the work areas and the procedures used to execute every activity, will ultimately help everyone in the work teams to be better, faster, and more competent at what they do, in a far shorter time, than they would by using any other method.



In addition, there will obviously be a marked reduction in press changeover time and a significant increase in productive output.

Therefore, the primary benefit of the Inventory Management Project is it demonstrates quickly and powerfully the business and the personal benefits of integrating Just-In-Time practices and Inventory Control organization methods, to make the work of diecutting, simpler, faster, better and less costly.



Inventory Management:

Recommended Actions

“All organizations engage in the three basic activities of strategy, tactics, and logistics. Strategy defines the job. Tactics does the job. Logistics provide the resources to get the job done--- not only material resources, but also manpower, funds, and data.” ~Robert L. Siegel



The initial project should be described and discussed in detail with the entire work team, however, to limit the degree of chaos, which could be caused by everyone working on the project at the same time, it would be more pragmatic to limit the project to one press and to one press team.

- *The first step in any new project must be to get the entire work team together to describe the project, to outline the potential benefits of the change,*



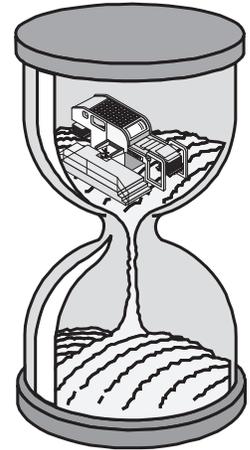
Is this Step Adding Value or is it simply Adding Cost?

to discuss the obstacles and challenges, and to brainstorm methods and practices for starting the project.

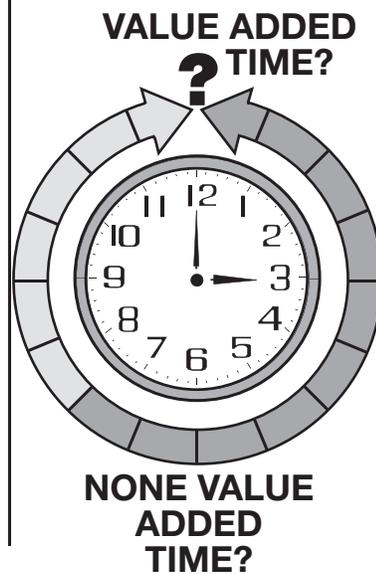
- *To simplify the project and to ensure the key benefits of the on-press combination of JIT and Inventory Control, it would be more effective to select or to seek volunteers to form a small team, on one press to work on this project.*
- *The work team should define the work areas or activity centers on press.*
- *The next step is to prioritize these work areas or work cells, for Inventory Control preparation. My suggestion would be to begin at the Platen Stack or Diecutting Section as this is where the majority of work takes place.*
- *With the specific work cell selected, the organization of the work area can begin. This requires listing everything required to complete the activ-*

ity, and without leaving the work area.

- *Every component listed above must be given an identification number, and a permanent or a temporary on-press storage location.*
- *The storage location could be a single location shadow box, preferably color coded, which is mounted on the face of the press, or if it is a temporary tool, it would be mounted on a mobile tool module, which has color coded, single location shadow boxes, to hold temporary tool and material required to complete one or a sequence of activities.*
- *Some of the materials and supplies are consumable items, therefore, all of the consumable items must be subjected to a post-process checklist, to ensure they are always in optimal condition and in the correct quantity.*
- *To manage the inventory control system, it is essential to create a series of checklists for each work area on-press, to be executed before the last production run is complete, to verify everything is in position for the next changeover.*



We have reiterated a number of times, that the organization of this project is not a complex challenge, but getting everyone to give up their individual ways of doing things, is not an easy task. In my experience, everyone genuinely believes their method of completing each diecutting activity is the best method for themselves, the



team and the company, It will require support, positive reinforcement, and ultimately discipline, to get through the first stage of what ever project is selected. Fortunately, the inevitable outcome of this project will be to convince everyone involved that this is more effective, it is safer, it is easier, it is less stressful, and ultimately, it is a more productive way of doing things.

Section Fourteen:

Inventory Management: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ There are many different materials, tools, components, parts, supplies, information, and work-in-process resources required to complete each step in the manufacturing process. These activities could include ruling a steel rule dieboard, it could be locking the die in the chase, it could be rubbering the die, it could be nicking a die, it could be taking an impression, and it could be patching up the job to achieve a kiss cut impression.
- ✓ Everyone of these activities requires tools and equipment, materials and supplies, parts and components, and information to complete the specific task. Every one of these resources is either permanently located at the site of the activity; or it is temporarily delivered to the site of the activity, and is returned to a dedicated storage location; or it is a consumable resource, which must be replenished as it is used; or it is work-in-process, which is transformed by the activity; or it is product and waste, which must be managed and delivered to the correct location; or it is information, which is required to guide the activity, and information, which is generated by the activity, which must be managed and delivered to the correct location; it is the space itself, which must be minimized to reduced cost, but which must be large enough to accommodate the safe execution of the activity; and it is the integration with the internal and external customer-supplier chain to coordinate the delivery of everything needed to execute each task in a lean and an efficient manner.
- ✓ The goal is to be able to complete a specific diecutting-converting task with minimal preparation time, and with movement from and around the activity to access tools and materials and information and resources.
- ✓ Inventory management and control is not only making sure you have everything you need to complete an activity immediately to hand, but what ever activity is being executed, it is organized in a manner to minimize time to access everything that is needed, and all of the consumable items are replenished to the correct supply levels.
- ✓ Just-In-Time and Inventory management & Control are closely integrated, because Just-In-Time helps us to understand how to organize the workplace in terms of time and motion, and inventory management and control helps us specify what goes where, when and why. In reality, just like SMED and all of the other disciplines specified in each of the manual sections, effective inventory management and control, is essential to fast press changeover.
- ✓ If you walked from press to press through your operation you should notice that the organization of tools, materials, parts and components is very different, from one press to the next. In the past we have always respected and allowed individuals to do their job in any reasonable manner they saw fit. This is no longer practical, nor is it acceptable, nor commercially viable.
- ✓ The model for press changeover organization we described in an earlier section was the hospital emergency or operating room. We used the following description to define how the principles of Just-In-Time organization apply to this activity. However, when you read it this time, think in terms of all of the tools, materials, and supplies which must be in place, and which must be replenished to keep this key area in optimal operating condition.
- ✓ The challenge we face is to look around the industry, to look around the country, to look around the world, and to recognize the established commercial structure has radically changed, and the degree and the speed of change is accelerating every day. Our jobs, our future, and our security, require an aggressive reorganization of all of our skills, our resources, and our colleagues, so we can become the world class manufacturing organization we have the talent to achieve.

Section Fourteen:

Inventory Management: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Describe the principles and the practices of Inventory management & Control as it is applied to the diecutting process, and to press changeover in particular?
- ✓ Describe how you would organize a work area to put together the lower bottom pin frame and telescopic pin placement?
- ✓ How do you think the quote by Benjamin Franklin, *“A place for everything, everything in its place,”* can be used to organize on-press work areas?
- ✓ Describe how and why the Just-In-Time discipline and the Inventory management Control system work hand-in-hand together?
- ✓ If you stood on each of the platforms of each of the presses in your operation, how would you rate their organization preparedness for fast press changeover?
- ✓ How do you see Inventory management & Control impacting value added time and non-value added time?
- ✓ How do you see Inventory management & Control impacting speed of execution, and the time required to complete a press changeover?
- ✓ How do you see Inventory Control reducing the cost of manufacturing?
- ✓ Is it practical to develop an effective standard operating procedure when the work area in which the activity takes place, is random and inconsistently organized?
- ✓ Identify four of the on-press work areas where the inventory management system should be organized?
- ✓ Identify two of the off-press work areas where the inventory management system should be organized?
- ✓ Identify six of the tools, components, supplies or materials, which should be included in an inventory management and control system?
- ✓ What is the purpose of a shadow box and how would it prove to be an advantage in this system?
- ✓ What is the purpose of color coding and how would it prove to be an advantage in this system?
- ✓ How would you handle tools which are used on press permanently and tools which are only required during press changeover?
- ✓ How would you deal with consumable items and name three examples of these materials?
- ✓ How could we minimize the initial complexity of the Inventory management & Control Process?

Manufacturing System of Organization

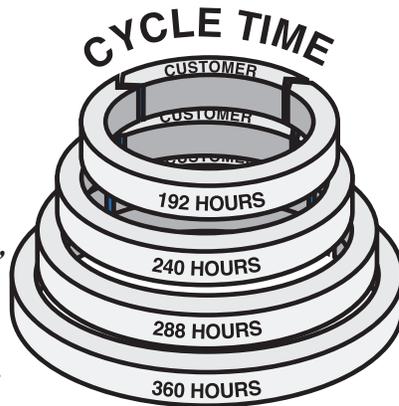
Section 15: Make it as Simple as Possible!

Key Definitions: ... to reduce to basic essentials ... to diminish in scope or complexity or extent ... to reduce to fundamental parts ... to make something less complicated and therefore easier to do or understand ... an explanation that omits superfluous details and reduces complexity ... the act of reducing complexity ... to reduce what is complex to greater simplicity

The Mission Statement: "It is the mission of the work team to reduce the complexity of work planning, to pare down procedures to the simplest possible state, to refine and organize the work areas to improve safety and to minimize waste in terms of time, motion and resources, and to close the loop after each cycle to seek simplification and streamlining."

Make it as Simple as Possible: An Overview
"When the solution is simple, God is answering." ~Albert Einstein

In focusing intensely on the rapid development of a productive operation, there is a real danger of adding unnecessary layers of complexity. The primary goal in manufacturing is one of constant refinement, and an aggressive daily focus on streamlining existing methods and practices. The buzz word of the moment is "Lean Manufacturing," however, whether you are involved in a lean manufacturing initiative, or a Six Sigma discipline, the bottom line is an urgent need to make everything simpler and easier.



Albert Einstein defined this balance perfectly when he stated; "Make everything as simple as possible, but no simpler." In developing and elegantly defining one of the most comprehensive principles of modern physics, Einstein practiced what he preached; "Out of clutter, find simplicity. From discord, find harmony. In the middle of difficulty lies opportunity."

In manufacturing five questions are constantly asked to drive this simplification initiative. These are:

- Where are we now?
- Where are we going?
- How will we get there?
- How will we know it is better?
- What is our next action?

The key measurement of this discipline is the ability to reduce cycle time by reducing turnaround and increasing throughput.



A pragmatic example of this type of initiative was found in Japanese Manufacturing organizations. When purchasing Western built technology, they were astounded by the number of different tools required to adjust a piece of machinery. It was not an uncommon practice to saw the heads off the many different sized bolts used in a piece of equipment and weld on a replacement standard bolt head, which resulted in every adjustment required a single tool.

This action obviously speeds up and simplifies processing, and the investment pays for itself in a remarkably short time. Think about how much time is lost in looking for tools, in sorting through tools, in walking backward and forward retrieving tools, in putting one tool down and picking the right one up?

Why would each pre-press technician or press operator not wear the same tools belt used by construction



workers, and store the tools in this highly effective manner? This simple change has been proven time and time again to reduce preparation time and press changeover by as much as 10%. Not only does this simplify the process, it reduces fatigue, it makes every task easier, it reduces stress, and it

ensures every team member involved in press changeover is as well organized as every other team member.

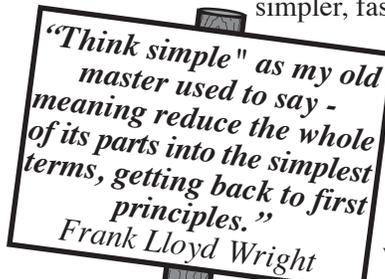
The ABC's of Fast Diecutting Press Changeover!

Make it as Simple as Possible:

Problems & Solutions

"Genius is the ability to reduce the complicated to the simple." ~C. W. Ceram

The majority of existing activities in diecutting contain excess waste and non value-added time. There are always



"Think simple" as my old master used to say - meaning reduce the whole of its parts into the simplest terms, getting back to first principles."

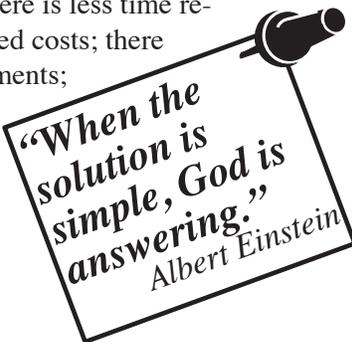
Frank Lloyd Wright

simpler, faster and better alternatives if we would drive a daily focus on process simplification. This is particularly important as we introduce new players to the work teams. Training and teaching all of the methods and practices,

and skills and abilities, in the shortest time possible, is a daunting challenge. Although expenditure on training and skill development

is a high priority, few organizations focus on lowering the knowledge bar, or reducing the complexity of what needs to be taught.

Every simplification refinement has multiple benefits. There is less to remember and less to be taught; there is less opportunity to make errors; there is less opportunity for fatigue and accidents; there is less time required, and therefore, reduced costs; there are lower man time requirements; there are lower skill needs; there is less training time; there are consistently lower costs; and there is greater throughput, with higher productivity and increased profitability.

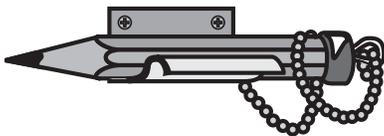


"When the solution is simple, God is answering."

Albert Einstein

If companies are to survive, let alone prosper, they must focus on becoming the fastest producer, at the lowest cost, with the highest acceptable quality. Therefore, as important as productive improvement is, it should not obscure a foundation discipline of effective manufacturing. Simpler is generally better.

As Dr. An Wang explained; *"No matter how complicated a problem is, it usually can be reduced to a simple, comprehensible form, which is often the best solution."*



PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

A key goal of every diecutting operation should be to make things easier, unfortunately, our reality is we make things more complex. In addition, the implementation of these projects directed at improving press changeover performance, will unfortunately complicate everything for a period of time.

In fact, the initial difficulty of implementation is often what deflects and ultimately brings these projects to a halt. The degree of complexity in every activity will certainly rise as we stabi-

lize, standardize and attempt to eventually streamline the operation. Most of the effort required to get from where we are to where we need to be, must be expended in the early stages of each project, where the greatest resistance to change will appear.

Many examples of this from a sports orientated society can be used to illustrate the challenge. Leading athletes achieve greatness when they make seemingly impossible plays look simple. Their level of performance is generally achieved by paring away unnecessary movement, by eliminating excess effort, by careful refinement of each step, and by conserving and directing the minimum amount of energy at each specific outcome.

Naturally, outstanding performance is the result of careful coaching and practice, practice, practice, and more practice! But with sports as with diecutting, the simpler the



process the easier each tasks becomes to execute. Reducing the complexity of any activity cuts time, it cuts cost, it cuts down on fatigue, it cuts opportunity to make errors, it cuts the chance of an accident, and it cuts the complex-



"Making the simple complicated is commonplace; making the complicated simple, that's awesomely simple, that's creativity."

Charles Mingus

ity of training.

However, the promise of this effort is best described by Andrew S. Grow, when he stated; *"In the first round of work simplification ... you can reasonably expect a 30 to 50 percent reduction ... to imple-*

ment the actual simplification, you must question why each step is performed. Typically, you will find that many steps exist in your work flow for no good reason. Often they are there by tradition or because formal procedure demands it, and nothing practical ordains it."

The challenge of simplifying and eliminating unnecessary complexity for the diecutting process is it is hard



work in the beginning. And the hardest work is getting the entire work team to buy into the concept and to persist in the effort, until the inevitable benefits begin to capture their interest and to fuel their enthusiasm.

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

What is the cause of the layers and layers of unnecessary complexity we have accumulated in diecutting converting? The primary cause is everyone does the same job differently! If the procedures are different from person to person, and different from job to job, the process gradually becomes more complex & contains more and more non-value added activity.

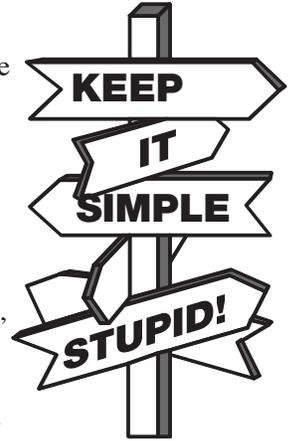
Tradition, is an important part of the technical resource of knowledge and experience, which should be passed from one generation to the next. However, in this mentor-student hand over, many superfluous actions, steps, and frankly bad habits, get passed on and obviously endorsed by the master craft professional. Because the trainee is simply that, a trainee, they lack the ability or the strength of character to question the validity of every



"Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius - and a lot of courage - to move in the opposite direction."
Ernst F. Schumacher

step and every action of every procedure. As a result, when conducting a technical audit of diecutting and the question is asked; *"Why do you do that?"* The answer is generally; *"We have always done it that way!"* And as every trainer and every qualified press operator in an organization has a unique and individualized approach to key activities, the trainee builds layer upon layer of techniques and methods, which contain more and more superfluous actions.

If companies commit to stabilize, to standardize and to streamline the process, the integration of all of the methods and practices into a unified approach to press set-up, inevitably strips away the majority of the non-essential actions. This is driven by three simple but often hard to answer questions in diecutting:



- 1: What worked well?**
- 2: What worked badly?**
- 3: What do we need to change for the next cycle?**

If every key activity and every procedure is executed consistently by every team member, and every procedure is regularly reviewed and upgraded, the process rapidly become less complex and the majority of non-value added time is gradually eliminated.

It is also important to factor in the impact of progressive and of aggressive change. Each person greets change with a different degree of uncertainty. The unpredictability of the future generates apprehension in one person, and an adrenaline rush in the next person. Constant change is a facet and an unavoidable dynamic of our lives, and it is a mistake to exclude this force from day to day activity in diecutting.

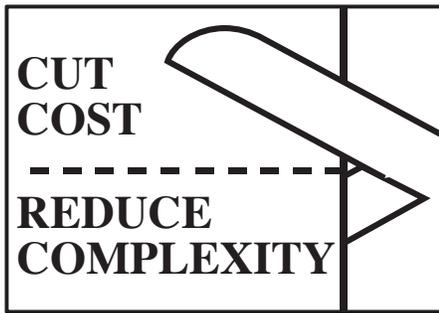
But although change is constant, it is not consistent.



Change is rarely predictable, neat, clean, or tidy, and even when we expect it, there is always a degree of surprise. Change can be described as a wave motion, but waves that undulate wildly and vary enormously from crest to trough. Accelerating and decelerating,

The ABC's of Fast Diecutting Press Changeover!

always moving and never at rest. Imagine trying to do your job as you ride a surfboard? As soon as you get your balance, you will concentrate on what you are supposed to be doing! The problem we face in diecutting is very similar. As soon as we get our balance and a feeling for the change, we are unbalanced again!



Knowledge, skill and experience used to last an entire career, with minimal change. Now it is estimated each person entering our industry will need retraining several times during their working life! Traditional trade skills are giving way to techniques, procedures, and practices, which must be flexible, which must be adaptive, which must be faster to learn and simpler to perform. A long term employee may soon be defined as someone who remains with the company 5 years or less!

The old ways of doing things are no longer effective. We have to continually stabilize the process, standardize procedures and activity, regularly benchmark performance, and aggressively simplify the system of diecutting manufacturing. And those who are unwilling to adapt, or who fail to respond to the challenge quickly enough, will simply go out of business!



SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

An early statement in this manual said; *"If we are unable to measure it, it is impossible to manage."* Simplification will and does emanate from developing a consensus with the entire work team during the process of stabilizing and standardizing current procedures. The brainstorming, discussions,

Make it as Simple as Possible!



and often heated exchanges which accompany resolving different approaches and selecting a unified practice, are excellent superfluous activity detectors, and many unnecessary moves and actions are stripped away.

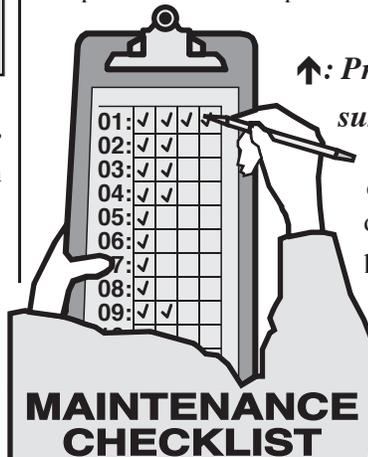
The next stage of the process, benchmarking, the established standard immediately imposes a different type of process measurement system, in the form of smaller time increments. This competitive working and reworking of a key procedure, is a very effective tool in streamlining the process.

Standardizing the layout of a work area, and applying Just-In-Time organization skills and Inventory Management and Control disciplines to the procedure, and to the area the procedure is executed in, is a powerful tool for exposing wasted time and motion.

The discipline of problem solving is inevitably about simplification and streamlining. If you can apply a solution to a perennial problem, or even better, if you can integrate the solution into the process and thereby prevent the problem occurring in the first place, the process is simpler, easier, and better.

The solution to the problem of reducing complexity in manufacturing, simply requires implementing disciplines such as Time Management, Just-In-Time organization, Single Minute Exchange of Die, Inventory Management & Control, as they are all built around a rationalization of the work involved, with the added goal of stabilization, standardization, and simplification.

What are some of the examples of making the process simpler and less complex? These could include:



↑: **Pre-Calculating the Pressure to Diecut.**

(One of the most complex tasks facing the diecutter is to select the pressure to diecut. Too high, and damaged knives, excess patching, high waste and low productivity are the outcome. When the pressure is pre-calculated cor-

"Genius is the ability to reduce the complicated to the simple."

rectly, it greatly reduces the time and the complexity of setting and sustaining a kiss-cut impression.)



“Life is not complex. We are complex. Life is simple, and the simple thing is the right thing.”

Oscar Wilde

↑: **Press Calibration.**

(One of the reasons the cutting Impression is so difficult to predict and to manage, is the platen is often not level, not parallel, and deflection under load is poorly managed.)

↑: **Implement Two-Sheet Patch-Up.**

(Leveling the impression using a “Pressure Reduction” approach, significantly lowers potential die damage and ensures a stiffer, stable and more consistent cutting impression, which can be achieved in a third of the time of standard procedures.)

↑: **Steel Rule Die Calibration.**

(Any assumption that the steel rule die is perfectly leveled and that every knife and rule is seated at the exact same height as every other rule is dangerous. A properly calibrated and pressure balanced steel rule die will significantly lower the complexity of press set-up.)

↑: **Implement Progressive Tooling.**

(The implementation of multi-height, incremental, or progressive tooling in Stripping and in Blanking will significantly lower the complexity of high speed waste removal and product stacking.)

↑: **Using Tool Belts.**

(When pre-positioned tools, and duplicated tools are introduced into the system of changeover, and combined with the development of a specialized diecutter tool belt, the reduction in unnecessary movement and non-value added time, is significant.)

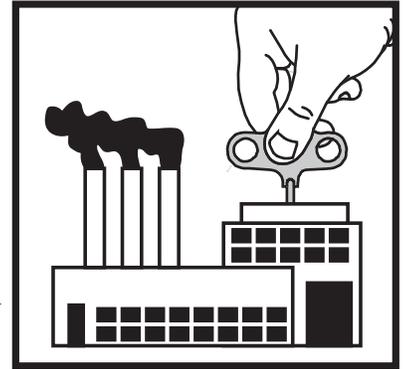
↑: **Implement JIT, SMED, & Inventory Control.**

(By finding the most efficient and effective layout for the work area and for the execution of key tasks, the work area forces each team member to replace their existing random methods and practices with a system which enforces a method of manufacturing, which reflects the best ideas of the entire team.)

Simplification comes out of the implementation of the



disciplines of stabilization, standardization, and simplification, which are integral parts of the disciplines outlined in this manual. However, it is important to seize these opportunities, and for the entire team to recognize the value of streamlining and the reduction in complexity.



However, because the subject of this section is often a by-product of the implementation of disciplines specified in other sections, do not under-estimate the power of aggressively pursuing simplification of everything involved in diecutting. As Ralph Waldo Emerson stated; “To be simple is to be great.” The great world-class diecutting operations have a common and a distinctive approach to manufacturing. They relentlessly pursue the paring down of every action and the minimization of every activity, until it is as simple as possible, but no simpler. Faster, Simpler, Better and Lower Cost, is our new mission, and standardization, simplification and streamlining are the tools we use to develop this approach.

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

Simplification of procedures and work areas will certainly emerge from team brainstorming and discussions as new standardized methods and work areas are designed, however, the most effective tool for clearly illustrating reducing complexity, is videotaping.

In early sections we have suggested digital videotaping of press changeover by a team member or by an outsider or by a facilitator. Some companies prefer to set-up a single camera on a gantry over the press work area and to capture the action remotely. This has the advantage of lowering the cost of filming and it has the advantage of eliminating the distraction of a camera person.



The great advantage of the film is it can be viewed by the entire

The ABC's of Fast Diecutting Press Changeover!

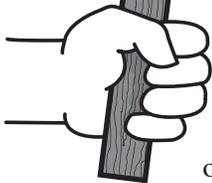
team, and the accompanying discussion is a powerful tool to spot opportunity, to share ideas, and to collaborate. In addition, it is a great learning opportunity, as there are so many aspects of each changeover, which can be critiqued. As with any of these initiatives, the code of conduct for respectful, positive comments, must be applied.

Ultimately, part of the record for the sequence of a procedure, and the set-up of a work area, will be a videotaped overview of the changeover process by one of the team members. This will provide a simpler, and less complex training tool for new recruits.

The Goals of Making it as Simple as Possible:

"Success is simple. Do what's right, the right way, at the right time." ~Arnold Glasgow

"Reduce the complexity of life by eliminating the needless wants of life, and the labors of life reduce themselves." ~Edwin Way Teale



The goals of process simplification are very straightforward.

They are to make the process faster, easier, better, and less costly.

Ultimately, simplification is by far the best investment, because all of the other goals contained in this statement carry inherent risk. Working faster, without simplification of the system of manufacturing is dangerous. Improving quality and diecut part consistency is always a valid and a valuable initiative, however, it has limited impact on operating cost. And cutting cost, without changing the process, generally makes the process less effective.

So simplification and streamlining, while difficult to quantify, as they are inherent to every process improvement activity, are non the less very important to the future of the diecutting organization. In fact cutting complexity, should be one of the highest priorities of closing the loop and in conducting process postmortems.



This is also a goal without a target, as the effort to simplify and to streamline is constantly evolving and changing. As soon as we make progress and established the latest standards for procedures and for work areas, new problems arise or new opportunity to reduce complexity reveals itself.

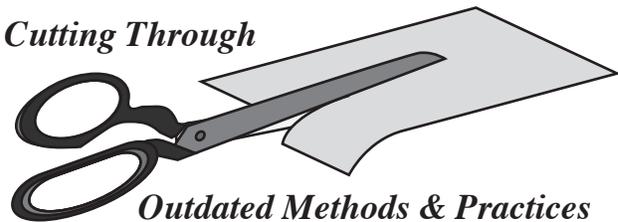
Make it as Simple as Possible: Methods & Practices

"It is always the simple that produces the marvelous."
~ Amelia E Barr

There are no defined methods and practice for pursuing simplification and streamlining, however, it should be included in every planning session, every procedural review, every reorganization of a work area, and it is particularly important when closing the loop. The standard questions should be augmented with an additional question, which reflects the importance of the initiative.

- : ***What worked well?***
- : ***What worked badly?***
- : ***What can we simplify or streamline?***
- : ***What do we change for the next cycle?***

Cutting Through



Outdated Methods & Practices

What is most important, is simplification and streamlining the process will be an integral part of the restructuring of the process, however, it is once everyone is working in the same manner, and every work area is organized in an identical manner, that the pace of simplification will increase.

Cutting complexity will work immediately, but it is far more difficult to gather and assess the benefit of a proposed change to the current non-standard and inconsistently applied methods, when every one is working in a different manner. If we are determined to gain the obvious benefit of making the process faster, simpler and better, the first step must be to standardize procedures and to standardize work areas.

As each activity is complete, the first phase of standardization and each work area has been stabilized and reorganized around Just-In-Time practices, the search for faster and less complex will gather momentum.

Make it as Simple as Possible:

The Benefits of Change

“In character, in manner, in style, in all things, the supreme excellence is simplicity.” ~ Henry W. Longfellow

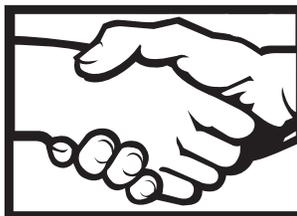
We actually covered this subject in an earlier section entitled Standardize, Simplify & Streamline, however, we have added a section dedicated to reinforcing the importance of this critical discipline. As you will see from the many benefits which are derived from focusing on simplification, the investment in time and effort is more than paid for by the benefits accrued. These would include:



- *Faster Press Changeover*
- *Easier & Simpler task execution*
- *A less complex process*
- *Shorter training and more effective training time*
- *Lower operating cost*
- *Faster turnaround & increased throughput*
- *Faster speed to market & shorter cycle time*
- *A safer workplace*
- *Lower manpower & better resource utilization*
- *Improved diecut part quality*
- *Faster press speed & higher yield*

Simplification is one of the more important disciplines to be generated by this focus on Fast Press Changeover. In the beginning the benefits of reducing complexity are less obvious. But as the organization is restructured around standardization, the ability to pare down unnecessary or duplicated actions, to fine tune the layout to eliminate non-value added time, and the customization of simpler more effective diecutting techniques, will generate considerable productive benefit to the operation.

TEAMWORK



SIMPLIFIES

Make it as Simple as Possible:

Recommended Actions

“Simplicity is the ultimate sophistication.” ~ Leonardo DaVinci

Simplification requires an action to be taken or a situation to be analyzed to enable the complexity of the action or the situation to be simplified. In the beginning, because the majority of procedures are not standardized, nor are the existing methods executed consistently, and because every identical work area is organized in a different and continually changing manner, process simplification will not yield impressive results. Attempting to simplify a random activity is impractical.

Therefore, simplification of the process will only begin to yield results as the procedures are standardized and the work areas are organized. This does not mean that simplification should take a back burner. In the beginning of this project the focus should be upon Technical Simplification, as these methods and practices are largely unchanged by the reorganization of the process.

This is particularly appropriate when you consider more than 80% of press lost time is expended working on different cutting, stripping, and blanking tools. Therefore, the first stage of simplification should focus upon the following technical challenges.

- *Press Leveling*
- *Stripping*
- *Blanking*

Obviously, others can be added, such as Creasing, Nicking, and/or Ejection. However, the areas of the greatest weakness in diecutting, where the press team should focus their technical simplification activity are:

- *Press Calibration*
- *Two Sheet Patch-Up*
- *Pressure Calculation*
- *Steel Rule Die Calibration*
- *Progressive Stripping & Blanking*

Simplifying these technical activities will significantly improve press changeover performance, they will improve press speed & yield, and they will improve diecut part quality.

Section Fifteen:

Make it as Simple as Possible: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ In focusing intensely on the rapid development of a productive operations, there is a real danger of adding unnecessary layers of complexity. The primary goal in manufacturing is one of constant refinement, and an aggressive daily focus on streamlining existing methods and practices. The buzz word of the moment is "**Lean Manufacturing**," however, whether you are involved in a lean manufacturing initiative, or a Six Sigma discipline, the bottom line is to make everything simpler and easier.
- ✓ Why would each pre-press technician or press operator not wear the same tools belt used by construction workers, and store the tools in this highly effective manner. This simple change has been proven time and time again to reduce preparation time and press changeover by as much as 10%. Not only does this simplify the process, it reduces fatigue, it makes every task easier, it reduces fatigue, and it ensures every team member involved in press changeover is as well organized as every other team member.
- ✓ The majority of existing activities in diecutting contained excess waste and non-value added time. There are always simpler, faster and better alternatives, is we would drive a daily focus on process simplification. This is particularly important as we introduce new players to the work teams. Training and teaching all of the methods and practices, and skills and abilities, in the shortest time possible is a daunting challenge. Although expenditure on training and skill development is a high priority, few organizations focus on lowering the knowledge bar, or reducing the complexity of what needs to be taught.
- ✓ Every simplification refinement has multiple benefits. There is less to remember and less to be taught; there is less opportunity to make errors; there is less opportunity for fatigue and accidents; there is less time required, and therefore, reduced costs; there is a lower man time requirements; there are lower skill needs; there is less training time; there are consistently lower costs; and there is greater throughput, with higher productivity and increased profitability.
- ✓ A key goal of every diecutting operation should be to make things easier, unfortunately, our reality is we make things more complex. In addition, the implementation of these projects directed at improving press changeover performance, will unfortunately complicate everything for a period of time.
- ✓ In fact the initial difficulty of implementation is often what deflects and ultimately brings these projects to a halt. The degree of complexity in every activity will certainly rise as we stabilize, standardize and attempt to eventually streamline the operation. Most of the effort required to get from where we are to where we need to be, must be expended in the early stages of each project where the greatest resistance to change will appear.
- ✓ Tradition, is an important part of the technical resource of knowledge and experience which should be passed from one generation to the next. However, in this mentor-student hand over, many superfluous actions, steps, and frankly bad habits, get passed on and obviously endorsed by the master craft professional. Because the trainee is simply that, a trainee, they lack the ability or the strength of character, to question the validity of every step and every action of every procedure. As a result, when conducting a technical audit of diecutting and the question is asked; "**Why do you do that?**" The answer is generally; "**We have always done it that way!**" And as every trainer and every qualified press operator in an organization has a unique and individualized approach to key activities, the trainee builds layer upon layer of techniques and methods which contain more and more superfluous actions.

Section Fifteen:

Make it as Simple as Possible: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ What is the focus of Lean Manufacturing?
- ✓ What are the five questions which drive the simplification and streamlining initiative?
- ✓ What actions were taken by Japanese Manufacturers, to simplify the use of Western Equipment?
- ✓ What are the advantages and benefits of using Tool Belts during press changeover?
- ✓ How does successful process simplification impact the complexity of training?
- ✓ What do you think is the connection between inconsistently applied procedures and the layers of complexity?
- ✓ What do you think will be the most difficult part of establishing a simplification project?
- ✓ How do traditions impact the current level of complexity in procedures and in the organization of work areas?
- ✓ What are the three key questions of process improvement in diecutting converting?
- ✓ Give three examples of technical simplification?
- ✓ What is the connection between Just-In-Time organization, Inventory Management & Control, SMED and simplification and streamlining?
- ✓ How can Videotaping Press Changeover assist with the simplification project?
- ✓ What question should be added to closing-the-loop or process postmortem to focus upon simplification and streamlining?
- ✓ Name five of the benefits of implementing an effective simplification and streamlining program?
- ✓ What is the role or teamwork in the simplification of the changeover process?
- ✓ How would a simplification action be approved and integrated into the appropriate procedure or layout of a work area?
- ✓ Where should the simplification project be implemented?

Manufacturing System of Organization

Section 16: Computer-Integrated-Manufacturing!

Key Definitions: ... *Computer Integrated Manufacturing (CIM) embodies three components essential to the implementation of flexible design & manufacturing -- the means for information storage, retrieval, manipulation and presentation; the means for machining and shaping materials & finished tool products, and the means to integrate each toolmaking process.*

The Computer-Integrated-Manufacturing Mission Statement: *"It is the mission of the work teams to learn and to utilize various computer technologies to integrate diecut product design, tool fabrication, and converting manufacturing, with the technical information required to ensure the toolmaking and the diecutting process perform seamlessly and flawlessly."*

Computer-Integrated-Manufacturing: An Overview

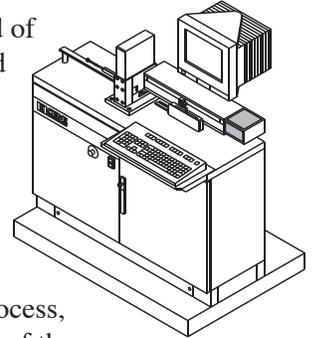
"Technology is dominated by two types of people: those who understand what they do not manage, and those who manage what they do not understand." ~Putt's Law

The introduction of Computer-Aided-Design and Computer-Aided-Manufacturing technology provided converting companies with a powerful tool to integrate and to systematically improve the entire manufacturing process. The strategic emphasis on CAD should be to integrate a seamless flow between the converting manufacturing units. Webster defines a system as; ***"A group of interrelated, interacting, or interdependent constituents forming a complex whole ... harmonious, orderly interaction ... a method or a procedure."***

Computer-Aided-Design and Manufacturing systems are most effective when they initially simplify the creation of the original design, and then provide a flow of information, derived from the design, which ensures each manufacturing unit in the operation is able to make the tools and to adjust the process, to ensure a precise and a consistent conformance with the approved design and the customer needs. This success is predicated upon using computing power to control the design, the specification, the machining, the fabrication, and the finishing of all of the tools used in the converting process.

Unfortunately, few organizations recognize or utilize the full benefit of the CAD-CAM information, design and control abilities. In most operations CAD-CAM is perceived

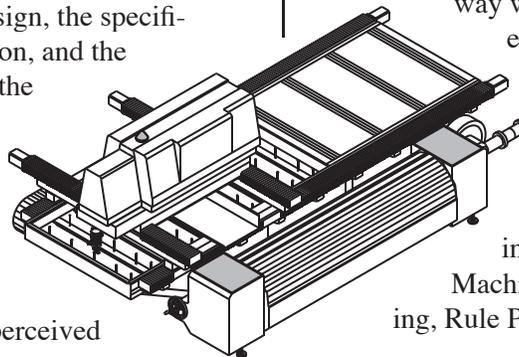
as a rapid and a reliable method of producing accurate samples and prototypes as part of an intense marketing and sales effort. A majority of companies use the system to integrate Graphics, Platemaking, and Die Fabrication. Although these are important extensions to the design process, they are only using a small part of the potential of this technology.



Designing and making tools is obviously critical in Printing and Diecutting, however, so is the way we use the tools, and obviously Press Changeover is simply changing one set of tools for the next set of tools. And we certainly do not have a track record of doing this well, or of ensuring the tools we install and synchronize, perform to the potential of the press technology. One of the reasons this happens is because we have too narrow a focus on CAD-CAM and on how we use it in diecutting converting.

The most effective way to describe the technology we use is Computer-Integrated-Manufacturing or CIM. In fact this term is being replaced by the term Manufacturing Process Management, as this is a more comprehensive description of the integration of different computer resources in manufacturing. So what is wrong with the way we are currently using Computer-Aided-Design and Manufacturing technology?

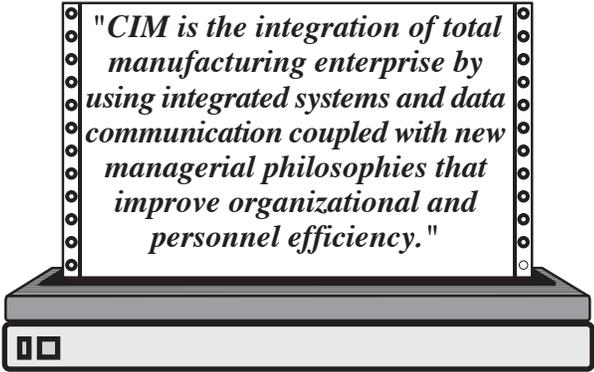
The original CAD systems were developed and introduced to drive numerically controlled tool machining systems, such as Laser Cutting Machines, Counter Manufacturing, Routing, Rule Processing, and now WaterJet Cutting



The ABC's of Fast Diecutting Press Changeover!

is added to the toolmaking technology list. Although hindsight is a remarkably accurate tool, it is obvious we started in the middle of the process, rather than at the front end, and while the development of these systems has certainly filled many of the gaps, we are still far from seeing CAD or CIM as the manufacturing control technologies they are inherently capable of becoming.

We fail to maximize the potential of our investment!



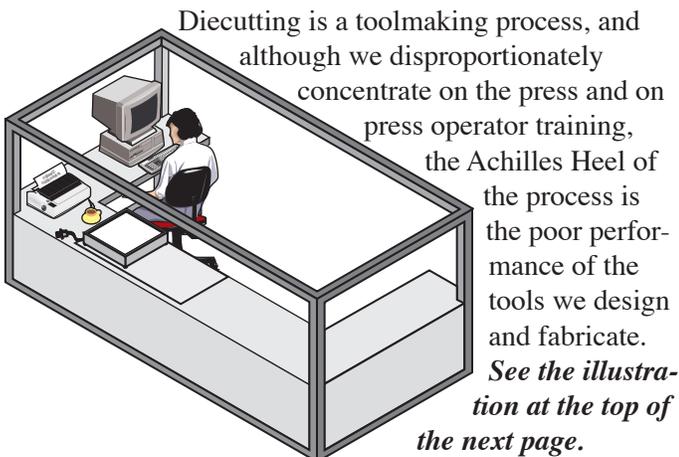
"CIM is the integration of total manufacturing enterprise by using integrated systems and data communication coupled with new managerial philosophies that improve organizational and personnel efficiency."

Computer-Integrated-Manufacturing: Problems & Solutions

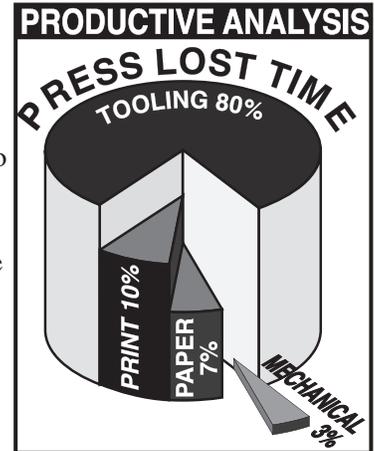
"Zymurgys First Law of Evolving System Dynamics: Once you open a can of worms, the only way to re-can them is to use a larger can." ~Anonymous

The quote illustrated above and continued here, is critically important to our new application of computer technology. ***"CIM is the integration of total manufacturing enterprise by using integrated systems and data communication coupled with new managerial philosophies that improve organizational and personnel efficiency."***

Unfortunately, our use of the technology rather follows ***"Zymurgys First Law"*** below the title of this part of the section! Why is this?



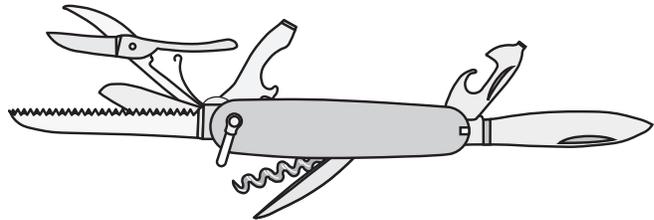
Computer-Integrated-Manufacturing is most effective when it is a closed loop of information and activities, which recycle to continuously increase our body of knowledge about the process we claim to be experts in.



How does a diemaker, a pre-press technician, or a diecutter access this key information resource, and how does he or she feedback changes, corrections, suggestions and problems?

Computer-Integrated-Manufacturing is most effective when it is a distributed system, with access and input sites at key locations throughout the diecutting converting operation.

How does a diemaker, a pre-press technician, or a diecutter access this key information resource, and how does he or she feedback changes, corrections, suggestions and problems?



Computer-Integrated-Manufacturing is most effective when it is a distributed system, with access and input to the most important information resource in diecutting; ***"The Design and Specification of Tooling, and the selection of tool converting parameters."***

How does a diemaker, a pre-press technician, or a diecutter access this key information resource, and how does he or she feedback changes, corrections, suggestions and problems?

The bottom line is a powerful indictment of how poorly we use the Computer-Integrated Resources at our disposal.

Computer-Aided-Design and Manufacturing is generally too distant from the action where the results of the decisions made in tool design, become apparent. This disconnect is a key reason the operation struggles with effective

tools design and manufacturing, and as a result, why the

"CIM is a manufacturing philosophy in which the functions for the organization, from product definition to the disposition of the final product, are designed and integrated to achieve clearly enunciated organizational goals, most efficiently and effectively. The coordination of the functions is achieved using computer, communication, and information technologies."



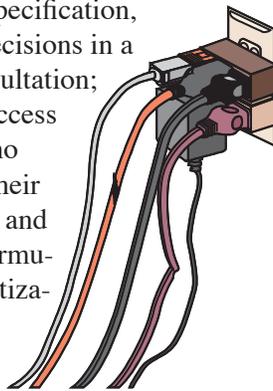
operation has such difficulty in fast press changeover.

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

The source of this problem is a failure to see an effective technical information data base as a critical and a unique ingredient and as a key resource of the organization.

This is the information which makes your organization unique; it is the information, which enables you to successfully convert products; and it is the information which is lost and squandered in every production cycle!

Currently, we make all of the key specification, design and converting parameter decisions in a remote location; with minimal consultation; with no way for the work team to access or to review the information; with no method for the work teams to add their ideas, corrections and suggestions; and we persist in using a "standard" formulae, which is the basis for commoditization of the products we produce.



This is the complete antithesis of teamwork, and of course it works poorly. Compounding this problem, is the CAD-CAM team are often stretched and stressed to keep up with an increasingly larger and diversified requirements of a more sophisticated tools and of new toolmaking technology.

Manufacturing is about the movement of information and material, therefore, why do we exclude the very people who use the information to complete their work?

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

What is the cause of the current stalemate in implementing an effective Computer-Integrated-System?

The first is obviously a lack of leadership imagination! Without a vision of a potential productive future using this technology, nothing will, and nothing has happened? Every manufacturing company, in every industry, in every country is turning to Computer-Aided-Manufacturing for Speed, for Simplicity, for Quality, and for Lower Operating Cost. What do they know that we have seemed to ignore?

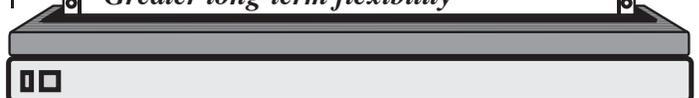
The second is simply the CAD team is usually overwhelmed with work, and over-accessed with questions, and never seem to have enough time to do the things they are already committed to doing! The instant success of the Structural Design power of these systems, has made it a powerful tool for sales and for getting the process underway quickly and simply. However, the CAD-CAM department's list of responsibilities and duties expand on a weekly basis! They barely have time to learn the system they are supposed to be experts in using.



The third reason we are not investing in a distributed computer-integrated-manufacturing system is perceived costs. Without the knowledge or the experience to put together a cogent return-on-investment plan or to justify the initial disruption as the system is implemented, nothing gets done!

POTENTIAL BENEFITS OF CIM

- Shorter time to market with new products
- Increase in manufacturing productivity
- Shorter customer lead times
- Improved quality
- Improved customer service
- Shorter vendor lead times
- Reduced inventory levels
- Greater flexibility and responsiveness
- Lower total cost
- Greater long-term flexibility



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"When computers (people) are networked, their power multiplies geometrically. Not only can people share all that information inside their machines, but they can reach out and instantly tap the power of other machines (people), essentially making the entire network their computer." Peter Drucker

confidence in the manufacturing team, and their ability to manage their part of the information resource.

So the cause of the failure to do what every other manufacturing operation is doing to be successful, is a lack of a vision, the lack of time, the lack of an investment plan and a lack of confidence!

However, rather than adopt a massive and a comprehensive program which would involve every department at once, why not implement a piecemeal program, step-by-step, to simplify implementation and to make as few waves as possible?



SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

This is a project, which crosses Customer-Supplier lines, and integrates almost every part of the converting process. It is obviously necessary to form a Computer-Integrated-Manufacturing Team, however, simply from a logistics point of view, it may be necessary to make the team two tier. The general team, which involves everyone impacted by a distributed CIM system, and a smaller group to act upon and reflect the wishes of the larger team. Therefore, some of the activities which must be started include the following:

- ➔ *The first step in any new project must be to form a Computer-Integrated-Manufacturing Team, and get them together to describe the project, to outline the potential benefits of the change, to discuss the obstacles and challenges, and to brainstorm methods and practices for starting the project.*
- ➔ *The important nature and the potential impact and consequences of the activity of this team, should*

The fourth reason is, who would lead the project, who would organize the program, who would teach and train, and who would lead the initiative on a day-to-day basis? Naturally, this implies an incorrect lack of

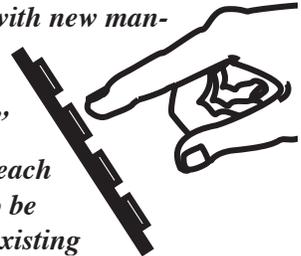
require the team to be led by a member of the Management Team.

- ➔ *Team Members should include members from the following functions:*

- * *Team Leader (CAD-CAM Leader)*
- * *CAD-CAM/Structural Design*
- * *Graphics Design*
- * *Platemaking & Printing*
- * *Toolmaking/Diecutting*
- * *External Toolmaking Supplier*
- * *Pre-Press*
- * *Diecutting*
- * *Finishing*
- * *Quality Control*



- ➔ *The Team Mission is the following quotation: "CIM is the integration of total manufacturing enterprise by using integrated systems and data communication coupled with new managerial philosophies that improve organizational and personnel efficiency."*



- ➔ *Select key members from each department or function to be trained in the use of the existing CAD-CAM system. These should include:*

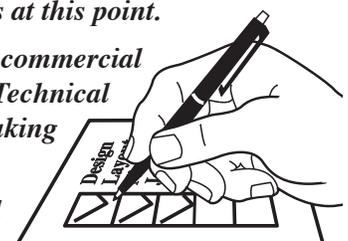
- * *Two Diemaker/Toolmakers*
- * *Two Pre-Press Technicians*
- * *Two Press Operators*

- ➔ *Selecting two members from each department provides a logical back-up, however, one of the two candidates from each department, should be further trained to provide a stand-in for the CAD team, in case of emergency and to assist the structural design team when the work load is excessive.*

- ➔ *Set up a distributed network with computer units in the Diemaking area, the Pre-Press Area, and the Diecutting area, with restricted access and limited user privileges at this point.*

- ➔ *Customize a standard commercial data base to set-up a Technical Data Base for Toolmaking and for Diecutting.*

- ➔ *The Data Base should*



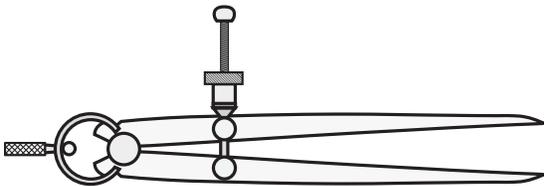
initially focus upon collecting, organizing and verifying technical information in eight (8) key areas. They would include detailed and approved (current) standards for the following activities:



- * The Specification of All Tools
- * The Design of All Tools
- * The Selection of All Converting Parameters
- * The Machining of All Tools
- * The Fabrication of All Tools
- * The Finishing of All Tools
- * Diecutting Pressure Management
- * Qualification Parameters for All Tools

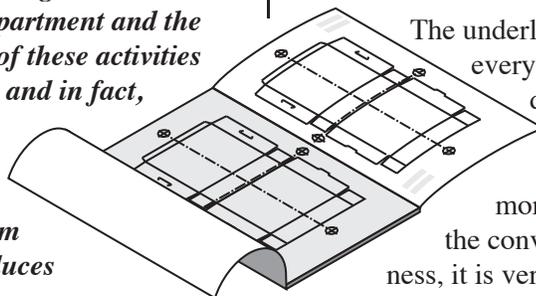
→ As this is a large project, the obvious first step would be to start with the last item specified, which is:

- * Qualification Parameters for All Tools



→ At the start of the project provide all network systems with limited access and input privileges. For example, all data, information, corrections, questions and suggestions, should be capable of being input and collected, however, core information would only be upgraded after review by the CIM team.

→ Move the Tangential Plotting Table to the Pre-Press Area. This may surprise many, but it makes perfect logistical sense. If you examine the work of the Structural Design Team, their primary function is structural design and the creation of a customer approved sample. Multiple samples, vinyl's, masks, drawings, varnish Lithography blanket cutting, and tool ordering should be handled by the diemaking department and the pre-press department. Many of these activities are like production activities, and in fact, many companies schedule these volume activities to the second shift, where a member of the manufacturing team operates the plotter, and produces



all the tools previously designed.

→ The major mistake we have made with Computer-Aided-Design is to largely overlook Computer-Aided-Manufacturing. Did you know, there are more than 40 tools which can be simply and quickly made using the large Tangential Plotter, which can be used in diecutting to reduce on-press time and complexity!

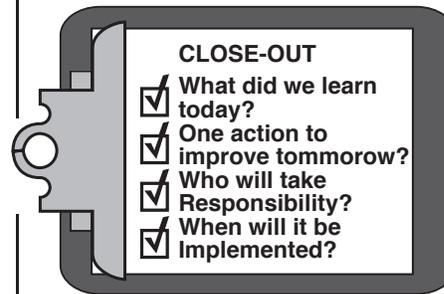
→ In the first stages of the project, each remote workstation would be password accessed, and the password must be changed weekly.

→ In the first stages of the project, each remote workstation, would be have the ability to print to a central printer in the pre-press area, and/or to

be added to the queue for the large format plotter.

→ In the first stages of the project, each remote workstation would have no ability to change data, or to

copy data, or to have any provision for a peripheral devices to be connected to the workstation.



CLOSE-OUT

- What did we learn today?
- One action to improve tomorrow?
- Who will take Responsibility?
- When will it be Implemented?

This is by no means all of the things we can do with the existing CAD-CAM system, however, this will give the CIM team a heads-up on some of the changes we could productively implement.

To ensure the success of this project, and given we will have multiple projects being worked on simultaneously, it is wise to take a pedantic and a steady step-by-step approach to the Computer-Integrated-Manufacturing project.

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

The underlying goal of this initiative, is to get everyone involved in key positions in the diecutting manufacturing process, to be capable and competent to use computers fluently. As more and more computer technology is entering the converting industry and general business, it is very important to implement some

The ABC's of Fast Diecutting Press Changeover!

form of computer and software training for key members of the work force. There are three important areas where a concentrated burst of education and training would drive this process forward. These are:

→ **Send the CAD CAM Team Leader to a local commercial program which teaches the use of Computer-Integrated-Manufacturing technology. These courses are run in all of the major cities, through Universities, Colleges and Trade Schools.**

→ **Send the individual department CIM team leaders, and particularly the person selected to back-up the CAD team, to a training program for the specific CAD CAM system the organizations uses. However, this initiative will be wasted if the person or people sent are not able to access the computer and start to use the software on a daily or a weekly basis.**

→ **Organize General Business Computing training for all the people involved in the CIM Project. The subjects to be taught would include:**

- * **Word Processing**
- * **Data Base Systems**
- * **Excel**
- * **Time Management Software**
- * **PowerPoint Presentation Software**
- * **A Forms Creation Program**

The goal is to give the CIM team members the basic tools to drive the Computer-Integrated-Manufacturing process, and accelerate the productive use of computer technology in diecutting converting.

The Goals of Computer-Integrated-Manufacturing:

"Man is the most extraordinary computer of all." ~John Fitzgerald Kennedy

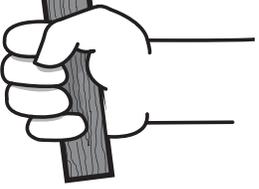
The goals of Computer-Integrated-Manufacturing are to make diecutting faster, to make it simpler, to make it better, and to make it at the lowest cost possible. The irony is we have invested



An individual without information cannot take responsibility; an individual who is given information cannot help but take responsibility.
Jan Carlzon

in the creation of the information resident in the design and the computer program that created it, the question now is, are we going to maximize the value of what we have already created!

We use technical information to make the tools, but we do not use it to make the tools work. We use it to make the tools, but we use such generic commodity specifications, we end up generating commodity products. We use it to make the tools, but we treat paperboard and design as though every carton or diecut part were identical, and every paperboard uniform in every property, and we act surprised when the product does not consistently meet



"Once a new technology rolls over you, if you're not part of the steamroller, you're part of the road."
Stewart Brand

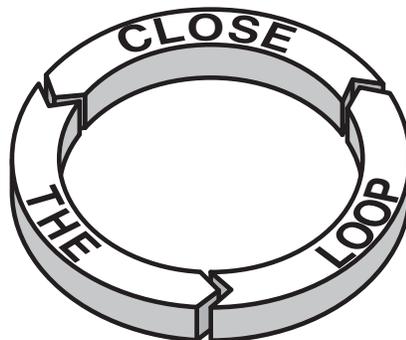
The fabrication of diecut products from raw materials using skilled personnel requires precise, timely information to be generated, collected, evaluated, organized, shared, & distributed evenly, to ensure effective control of an efficient manufacturing flow.

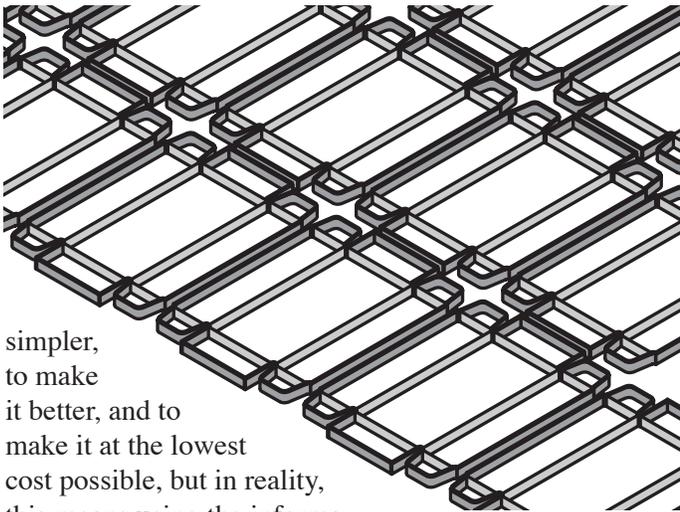
customer requirements. We use it to make the tools, but we have not a clue why 80 percent of on-press downtime is expended continuing the work on these tools made with the best technology available. We use it to make the tools, but we

attack low speed and poor press yield by using identical parameters for the next set of tools. We use it too make the tools, but see no connection between pressure, design and paperboard, and we fail to use the power of computing to resolve these perennial problems.

Frankly, we use the existing power of CAD-CAM systems extraordinarily poorly, and we do not even understand the source of the problem. The most damning statistic in diecutting is in the last 30 years, although tools, materials, and press technology has improved exponentially, we still manage less than 50% yield on a diecutting press!

We have the information we need to solve these problems, but if we constrain the potential of computer-integrated manufacturing, we will remain locked out from the very solutions we invested in. The stated goals of Computer-Integrated-Manufacturing are to make diecutter faster, to make it



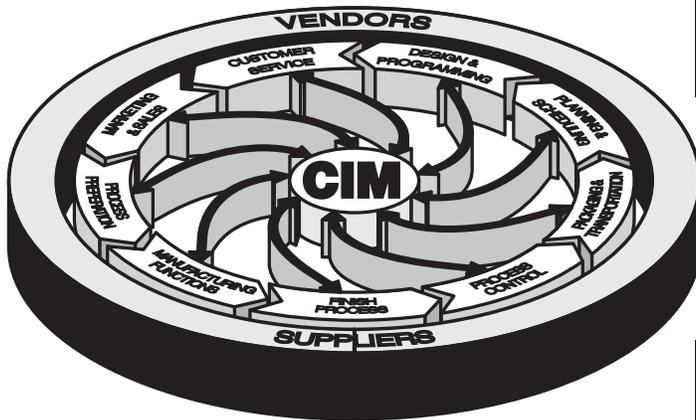


simpler, to make it better, and to make it at the lowest cost possible, but in reality, this means using the information, generated by the system, every time a diecut part is designed.

Computer-Integrated-Manufacturing: Methods & Practices

“One machine can do the work of fifty ordinary men. No machine can do the work of one extraordinary man.” ~Elbert Hubbard

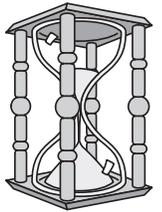
The only way this project can begin, is if there is a commitment from senior management to the Computer-Inte-



grated-Manufacturing system in principle, to the investment in hardware and workstations, and to the investment in time and training. Earlier, in the Solutions section we defined the starting point as the following top priority.

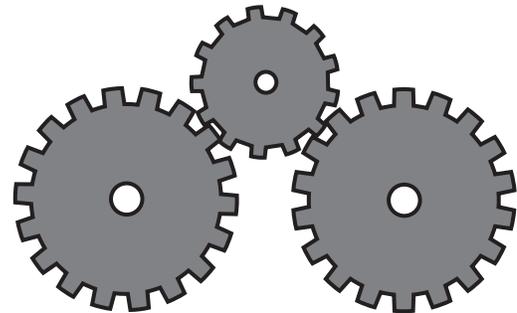
➔ *The first step in any new project must be to form a Computer-Integrated-Manufacturing Team, and get them together to describe the project, to outline the potential benefits of the change, to discuss the obstacles and challenges, and to brainstorm methods and practices for starting the project.*

However, there are two ways to approach the mission of this team.



The first is to follow the series of recommendations outlined in the Solutions section, but only if the management team and the technical team are confident of the viability of Computer-Integrated-Manufacturing in the diecutting converting operation. If there is not a majority in favor then the second focus of the team should be to investigate and to visit general manufacturing companies using CIM, and if possible to investigate and to visit any diecutting converting companies using this type of technology.

Visiting a general manufacturing company using Computer-Integrated-Manufacturing will be much easier as there are certainly local companies who are heavily



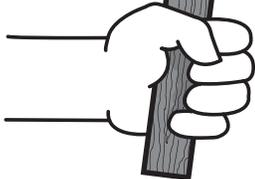
invested in this mode of manufacturing. Unfortunately, in direct contrast there are fewer converting companies using this approach to manufacturing, and when one is available the potential competitive conflict is generally a barrier to a visit.

Alternatively, it is possible to start the project with a single workstation in either the diemaking department or the pre-press discipline. Costs and organization time would be far less, however, the benefits of this approach could be evaluated, and fine tuned to generate a valuable information resource. This would also provide the team with a test bed and a research project, to more fully evaluate the

Computer Integrated Manufacturing is a system in which individual engineering, production, and support functions of a manufacturing enterprise are organized into a computer-integrated system. Functional areas such as design, analysis, planning, purchasing, cost accounting, inventory control, and distribution are linked through the computer with factory floor functions such as materials handling and management, providing direct control and monitoring of all process operations.

The ABC's of Fast Diecutting Press Changeover!

In the average plant 20 to 25 percent of the cost of goods sold is spent on finding and correcting errors. And many of the workers do not actually produce anything-- they just correct mistakes.
Henry J. Johansson



project, before advancing to a more widespread and a more expensive commitment.

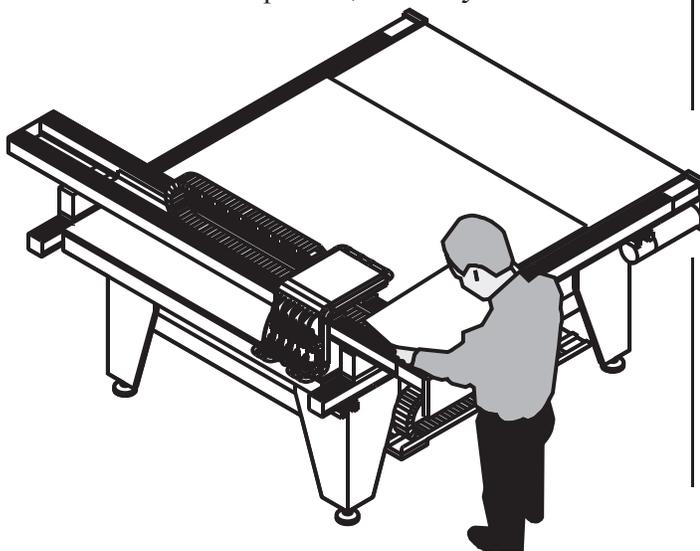
Computer-Integrated-Manufacturing is the driving force behind the majority of successful manufacturing organizations. How can your organization accept the risk of being left behind?

Computer-Integrated-Manufacturing: The Benefits of Change

"The workers and professionals in the world will soon be divided into two distinct groups. Those who will control computers and those who will be controlled by computers. It would be best for you to be in the former group." ~Larry D. Eigen

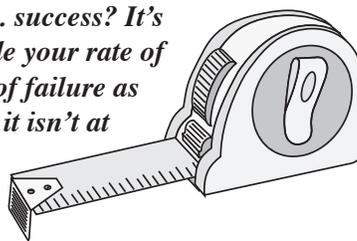
Ultimately, we find many of the answers which trouble us, which cause bottlenecks, which cause mistakes, and which reduce the effectiveness and the efficiency of the diecutting operation. No matter how long the make-ready, it will eventually come to an end. No matter how much we chase the cutting impression, it will eventually stabilize. No matter how many times we re-adjust the press or fiddle with the tools, the production run will end!

It may seem hard to accept, but this type of frustration is extraordinarily valuable, because it educates each one of us about what does not work, and it narrows the search for the methods and practices, which will work! As Thomas Watson explained; *"Would you like me*



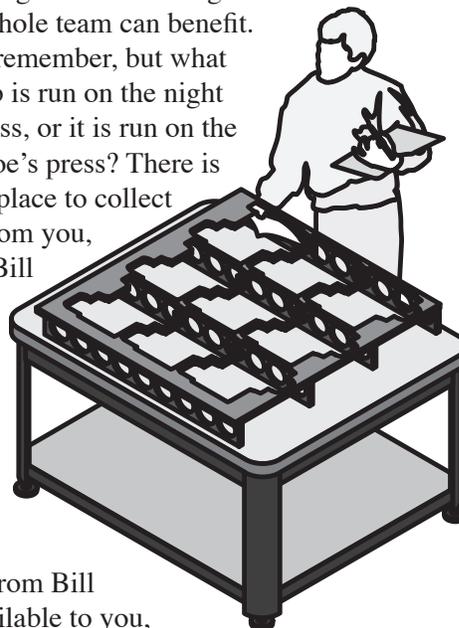
to give you a formula for... success? It's quite simple, really. Double your rate of failure... You're thinking of failure as the enemy of success. But it isn't at all... You can be discouraged by failure -- or you can learn from it. So go ahead and make mistakes.

Make all you can. Because, remember that's where you'll find success. On the far side of failure."



The problem with our current organization is we have no method of collecting and distributing the solution to each problem, so the whole team can benefit.

You say you will remember, but what happens if this job is run on the night shift, on Bill's press, or it is run on the second shift, on Joe's press? There is no mechanism in place to collect the information from you, and share it with Bill and Joe, at the appropriate time when they are facing the same challenge. And equally frustrating, there is no system in place to collect solutions from Bill and Joe, to be available to you, should you face a problem, they have already found a solution for?



This simple factor is why we struggle. Just imagine a disciplined system of information collection and management was in place, which collected problems, which identified causes, which recommended solutions, and which suggested innovations? This is one of the key attributes of having a distributed, computer-integrated-manufacturing system. We are all linked together, we can all pool our knowledge and experience, we can all share from the inevitable challenges of a difficult process.

This is just one facet of a Computer-Integrated-Manufacturing System.

It makes diecutting converting faster, easier, better, and a great deal less costly. As Confucius stated; *"A person who has committed a mistake and doesn't correct it is committing another mistake."*

Our current system of manufacturing is not a learning, sharing, or a team education process. Computer-Integrated-Manufacturing closes this loop!

Computer-Integrated-Manufacturing: Recommended Actions

“Technology is a way of organizing the universe so that man doesn't have to experience it.” ~Max Frisch

Each of the recommended projects contained in this manual resonate with a fundamental common sense. Reading each one, adding your knowledge and experience, it is relatively easy to decide if the project is one you think has merit and one you can quickly determine, what action to take, or where to begin.

Computer-Integrated-Manufacturing is much less clear. The information resource we are talking about is largely an invisible resource, and we have to use our imagination, to conjure up a picture of how this system would work in diecutting converting. I am confident you have already read about or have heard about the successful use of Computer-Integrated-Manufacturing systems in general manufacturing, so the power of this type of technology is not the question.

How difficult will it be to develop a customized system to meet your needs? How much will it cost, how long will it take, and how can you tell it will deliver on the promise it has delivered in other industries? You are also well aware of the lack of information management discipline already an issue in diecutting, so how do you persuade all of the work teams to adopt this sweeping change to current methods and practices?

Usually at this point in all of the other sections we sum-

marized the recommended actions and add some additional comments or guidelines. However, this is a project, which requires detailed research, careful consideration, and meticulous planning.

Therefore, the recommendation is as follows:

- ➔ *The first step in any new project must be to form a strong Computer-Integrated-Manufacturing Team, and get them together to describe the project, to outline the potential benefits of the change, to discuss the obstacles and challenges, and to brainstorm the most effective course of action.*
- ➔ *The second step should be to investigate companies who develop and implement this technology to gain a basic understanding of the process, and to see if they have any experience with converting.*
- ➔ *The third step should be to take the team to see a general manufacturing operation, who are successfully using Computer-Integrated-Manufacturing.*
- ➔ *The fourth step should be to investigate converting organizations, who are using CIM technology in the US and in Europe, and inquire about access.*
- ➔ *The fifth step, would require a minimal commitment by determining to experiment with a single workstation in a single department, and to proceed step-by-step, with the team making an ongoing assessment and adjustment of methods and practices.*
- ➔ *The final step is for the entire team to make a unified decision on the correct course of action.*

The first step toward achieving Computer-Integrated-Manufacturing flexibility is in establishing an information system that can be reshaped whenever necessary. This system will be capable of responding to the changing requirements of the enterprise and the environment. What's more, this reshaping must be accomplished with minimal cost and disruption to the enterprise.

No doubt automation will play a key role in this information system. But automation alone cannot shorten lead times, reduce inventories, and minimize excess capacity to the extent required by today's enterprise. This can only be accomplished by integrating information throughout the enterprise. The result is that individual departments will be able to work, communicate, and respond as a team.

Section Sixteen:

Computer-Integrated-Manufacturing: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ The introduction of Computer-Aided-Design and Computer-Aided-Manufacturing technology provided converting companies with a powerful tool to integrate and to systematically improve the entire manufacturing process. The strategic emphasis on CAD should be to integrate a seamless flow between the converting manufacturing units. Webster defines a system as; "A group of interrelated, interacting, or interdependent constituents forming a complex whole ... harmonious, orderly interaction ... a method or a procedure."
- ✓ Unfortunately, few organizations recognize or utilize the full benefit of the CAD-CAM information, design and control abilities. In most operations CAD-CAM is perceived as a rapid and a reliable method of producing accurate samples and prototypes as part of an intense marketing and sales effort. A majority of companies use the system to integrate Graphics, Platemaking, and Die Fabrication. Although these are important extensions to the design process, they are only using a small part of the potential of this technology.
- ✓ The most effective way to describe the technology we use is Computer-Integrated-Manufacturing or CIM. In fact this term is being replaced by the term Manufacturing Process Management, as this is a more comprehensive description of the integration of different computer resources in manufacturing. So what is wrong with the way we are currently using Computer-Aided-Design and Manufacturing technology.
- ✓ ***"CIM is the integration of total manufacturing enterprise by using integrated systems and data communication coupled with new managerial philosophies that improve organizational and personnel efficiency."***
- ✓ Computer-Integrated-Manufacturing is most effective when it is a distributed system, with access and input sites at key locations throughout the diecutting converting operation.
- ✓ Computer-Aided-Design and Manufacturing is generally too distant from the action where the results of the decisions made in tool design become apparent. This disconnect is a key reason, the operation struggles with effective tools design and manufacturing, and as a result, why the operation has such difficulty in fast press changeover.
- ✓ Currently, we make all of the key specification, design and converting parameter decisions in a remote location; with minimal consultation; with no way for the work team to access or to review the information; with no method for the work teams to add their ideas, corrections and suggestions; using a ***"standard"*** formulae, which is the basis for commoditization of the products we produce.
- ✓ What is the cause of the current stalemate in implementing an effective Computer-Integrated-System? The first is obviously a lack of leadership imagination, without a vision of a potential productive future using this technology, nothing will, and nothing has happened? Every manufacturing company, in every industry, in every country is turning to Computer-Aided-Manufacturing for Speed, for Simplicity, for Quality, and for Lower Operating Cost. What do they know that we have seemed to ignore?
- ✓ The Computer-Integrated-Manufacturing system is one which crosses Customer-Supplier lines, and integrates almost every part of the converting process. It is obviously necessary to form a Computer-Integrated-Manufacturing Team, however, simply from a logistics point of view it may be necessary to make the team two tier. The general team, which involves everyone impacted by a distributed CIM system, and a smaller group to act upon and reflect the wishes of the larger team.

Section Sixteen:

Computer-Integrated-Manufacturing: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Do you see Computer-Integrated-Manufacturing as a viable project in your operation, and how would you see it initially working?
- ✓ What is your reaction to positioning the large tangentially controlled plotter in the pre-press department?
- ✓ Who in your organization, should lead this project, and who would you recommend participating in the Computer-Integrated-Manufacturing team?
- ✓ What is the difference between Computer-Aided-Design & Manufacturing and Computer-Integrated Manufacturing?
- ✓ What were the original CAD-CAM systems designed to achieve?
- ✓ How does your organization currently collect, manage and share technical information?
- ✓ What is the critical problem with the current isolation of the CAD-CAM system from diemaking, pre-press, and diecutting?
- ✓ Name five benefits of implementing a Computer-Integrated-Manufacturing system?
- ✓ Name five members of the Computer-Integrated-Manufacturing Development Team?
- ✓ Which department members should be trained as back-up for the CAD CAM Structural Designer?
- ✓ Where would be the most effective location for each workstation in the network?
- ✓ What are the technical toolmaking areas that information standards, should be developed for?
- ✓ What access parameters do you think are appropriate for each remote workstation?
- ✓ Would you see an advantage in the work teams learning and having access to general business software?
- ✓ What general business software would you recommend the manufacturing team learning?
- ✓ If the implementation of Computer-Integrated-Manufacturing system is not planned, what alternative system would you recommend?
- ✓ How would you see Computer-Integrated-Manufacturing improving the Speed, The Simplicity, the Quality and the Cost of Manufacturing?

Manufacturing System of Organization

Section 17: Diemaking & Toolmaking Organization

Key Definitions: ... diemaking represents the specification, the design, the machining and the fabrication of an integrated and a synchronized set of male and female tools ... which are installed in a reciprocating press ... which is in turn designed to stamp a sheet or a web of a substrate ... to create products and components of a higher value than the original material ...

The Diemaking/Toolmaking Mission Statement: "It is the mission of the diemaking work team to analyze the customer product and application, and analyze, specify, design, machine, fabricate, and finish, male and female converting tools, which are precisely registered and synchronized, to productively convert diecut products, which meet or exceed customer requirements."

Diemaking & Toolmaking Organization: An Overview

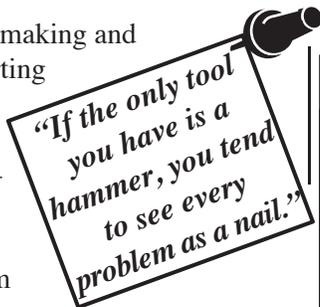
"Every company has two organizational structures: the formal one is written on the charts; the other is the living relationship of the men and women in the organization." ~Harold Geneen

As an apprentice in England I spent three years focusing upon the entire converting process, (specializing in diecutting), before I was certified, ready to begin the final two years of my apprenticeship, specializing in diemaking training. The underlying philosophy was sound, simple, and applied rigorously. "If you wish to become a professional diemaker, you must first achieve and prove competence in every element of effective diecutting. If you wish to become a professional diecutter, you must first achieve and prove competence in diemaking and toolmaking."

This long term approach to training is clearly outdated in the diemaking and the diecutting industry, but the basic principles of this approach to training and skill development are truer now than they have ever been. Diecutting is a toolmaking process, and statistically the majority of changeover time and lost time during production is expended working on the tools. Clearly, either the tools were not correct in the beginning, or they have to be continuously reworked to complete the production cycle.

There are ten key issues with diemaking and toolmaking in and for the converting industry. These are as follows:

The major problem is the separation and isolation of diemaking from the Pre-Press Discipline, from Press Changeover, and from



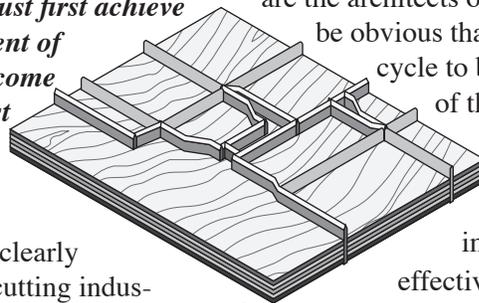
Press Production. The diemaker is not involved, they are not part of the diecutting problem solving or process improvement process, and they are not seen as being partially responsible for the ineffective on-press performance of the tools they designed and created. **This does not make sense!**

There is no doubt that the tool designer and the diemaker are the architects of diecutting success. It should also be obvious that for any tool design and toolmaking cycle to be a success, the greater the knowledge of the end use application of the tool, the more effectively the tool will meet the performance standards of the process it will be used in. So for this critically important role in converting, we have no effective training programs? **This does not make sense!**

The diecutting press is simply a toolholder, and although the competence of the press technician is critical to success, he did not specify, design, or fabricate the tool, and he is putting all of his faith in a diemaker who has a rudimentary knowledge of diecutting, at best? **This does not make sense!**



"If you wish to become a professional diecutter, you must first achieve competence in diemaking and toolmaking. If you wish to become a professional diemaker, you must first achieve competence in diecutting."



It could be that the on-press changeover and produc-

What is Toolmaking?

- ✓ An Engineering/Toolmaking Process
- ✓ A Pressure Balancing/Management System
- ✓ An Integration/Registration Process
- ✓ A Synchronization Process
- ✓ A Modular Production Line
- ✓ A Data/Information Processing System

The ABC's of Fast Diecutting Press Changeover!

"Imagination is our strongest tool - the ability to see ordinary things in new ways."

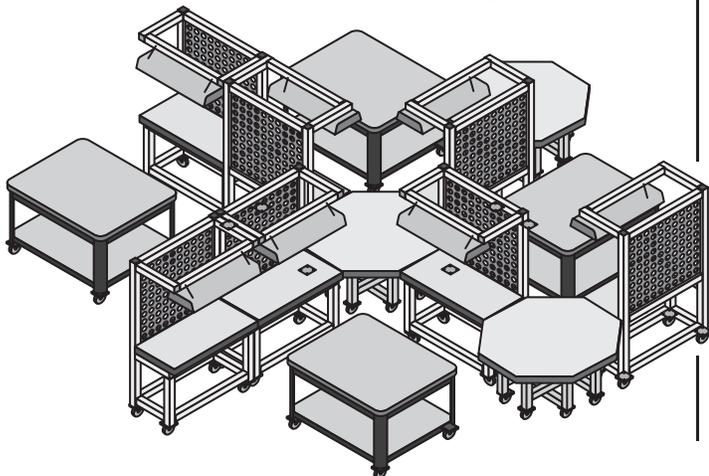
tion issues in your operation are the result of poorly trained press operators, but this must mean every operator in every company is poorly trained, because the national press yield is so abysmally poor? Is it possible the tool is not properly specified, designed and effectively manufactured for the on-press application?

This does not make sense!

The important Customer-Supplier chain of integrated partnerships, which every industry recognizes as critical to success, is a fractured disaster in diecutting converting! So how can we possibly improve the entire process if we are not cooperating and working closely together? **This does not make sense!**

James Anthony Froude explained the next problem perfectly, when he said; **"Instruction does not prevent waste of time or mistakes; and mistakes themselves are often the best teachers of all."** But how can we possibly learn from any mistakes or opportunities to improve the way we make our tools if we are not actively involved in the diecutting Close-Out-Loop? If the diemaker does not see or get feedback on the performance of the tools he or she made, how can they possibly improve? **This does not make sense!**

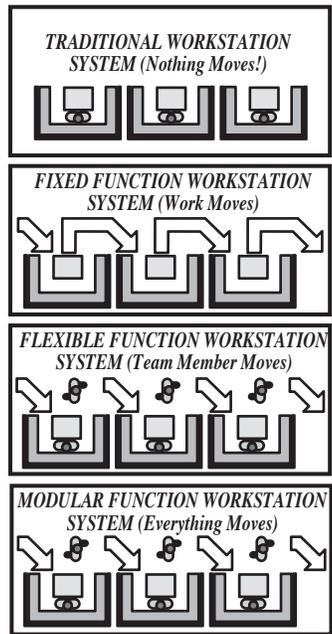
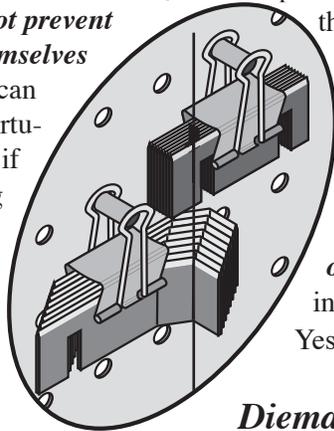
The greatest problem facing the commercial and in practice, the in-house diemaker, is the solid perception that tools are commodity products. No toolmaker agrees with this, myself included, but the customer is always right, and they are simply saying, no matter which company I purchase tools from, I see no change in produc-



tive output! Of course, as all diemakers will tell you, the customer is wrong! **This does not make sense!**

You may be able to pick holes in some of these arguments but the preponderance of evidence is that the tools the diemaker designs and fabricates are simply not good enough to do the job! **Now this, unfortunately, does make sense!**

It is easy to take cheap shots at any group, there are enough productivity problems to go around, but there is too much evidence to dismiss poor diecutting performance, as the inability of the customer or the diecutter to manage their own process. And if we are so confident, why do we attach a label, which states we have no responsibility for the tool after the first impression? Imagine the auto salesman yelling this after you as you drive away from the dealership. **"Hey, you are on your own now!"** Now there is confidence, there is integrity, there is world class customer service. Yes you are right. **This does not make sense!**



Diemaking & Toolmaking Organization:

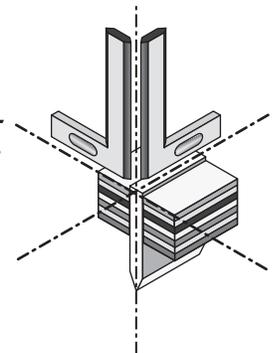
Problems & Solutions

"With the finest of personnel, an illogical organization structure makes waste through internal friction and lost motion; it fails to retain and develop good men and invite into its membership new men of high quality."

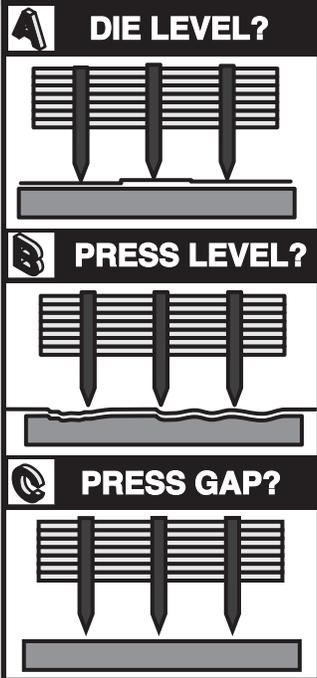
~Henry S. Dennison

As the quote above alludes to, the primary problem in commercial and in in-house diemaking and toolmaking is isolation from the customer and from the customer diecutting converting process. As Winston Churchill noted: **"If we are together nothing is impossible. If we are divided all will fail."**

We have nothing to be fearful of. By working more closely with our diecutting customer, we can



WHAT IS WRONG?



only gain knowledge, gain respect, and gain a partner in becoming a better diemaker and a better diecutter.

The source of this illogical breakdown in communication and feedback is more difficult to understand. It is as though the diemaker and the diecutter are both guilty of misunderstanding the true cause of on-press failure. The diecutter thinks it is his or her fault, and the diemaker agrees! Unfortunately, they are both wrong.

The only true test of any die, counter, male and female stripping tool, and male and female blanking tool, is

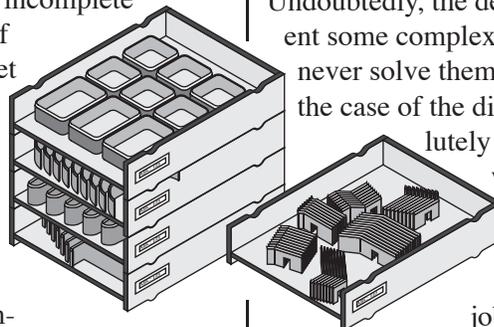
on-press performance. Any conclusion that poor performance is entirely the responsibility of incomplete operator training is obviously false. Of course, the diecutter can and should get better at diecutting, but why should the diemaker be so fearful of getting involved in this mutually beneficial analysis of press make-ready and press production?

We will not solve the technical or commercial problems of diecutting and of diemaking at a distance. If we are going to succeed, we must succeed together, because if either part fails, ultimately, we all fail!

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

The overwhelming evidence and constant feedback from diecutting is the tools do not perform the way they are supposed to perform. What is the critical problem causing consistency on-press failure?

There are 6 stages in Diemaking/Toolmaking production. These are:



1: Information

Management & Analysis.

2: Specification of

Tools &

Selection of Key

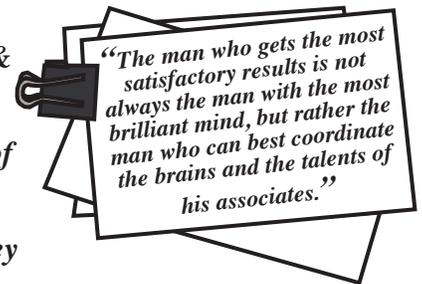
Parameters.

3: Design of Tools and Tool Integration.

4: Machining of Tools and Tool Components.

5: Fabrication & Assembly of Tools & of Tool Components.

6: Tool Inspection and Tool Finishing.

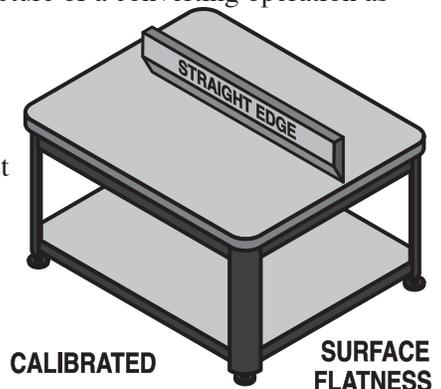


But how can we plan and design a tool without consulting with the tool user, particularly when they are often a two to three minute walk away? The answer must be, that we also believe tools are commodities, and nothing we do will make a difference?

Undoubtedly, the demands of high speed diecutting present some complex technical challenges, but we will never solve them by hiding our head in the sand, or in the case of the diemaker, in the sawdust! It is absolutely essential to recognize our customer, whether in plant or across the country, is a committed partner in a productive battle, where failure on either side, will ultimately undermine the job security of every person involved.

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

The primary cause of the problem is a failure to recognize the internal structure of a converting operation as a series of independent, but interdependent business units, which are designed to seamlessly interact on several cooperative levels. What is missing from these ineffective relationships?



The ABC's of Fast Diecutting Press Changeover!

→ A failure to build a professional customer-supplier relationship between our internal suppliers, and with our internal customers.

MIXING KNIFE BEVELS - BENEFITS

- Inside/Outside Diecutting
- Pressure Leveling & Balancing
- Eliminate Flaking & Delamination
- Strengthen Nick Holding Power
- Knife Concentration Compensation
- Kiss Cutting Control
- Faster Material Penetration
- Improve Cut/Crease Performance
- Eliminate Pressure Ridging
- Improve Scoring Performance

→ A failure to specify and document precise and unambiguous criteria for accepting information, for accepting work-in-process, and of for accepting materials and supplies to be used in our process.

→ A failure to work with our suppliers to develop a protocol for the transfer of work from one department to the next, and how and who would approve the transfer.

→ A failure to set-up regular training and cross training programs between department personnel and supplier personnel, to develop a more pragmatic understanding of the limits and current constraints on each process.

→ A failure for establishing a customer-supplier team from both departments to regularly discuss and find solutions to problems, issues, and non-conformance.

→ A failure to appoint one person, and a back-up, in the department to act as supplier liaison and to coordinate activity between each department.

→ A failure to specify and document precise and unambiguous criteria for delivering information, for delivering work-in-process, and/or for delivering materials and supplies to be used in our customer's process.

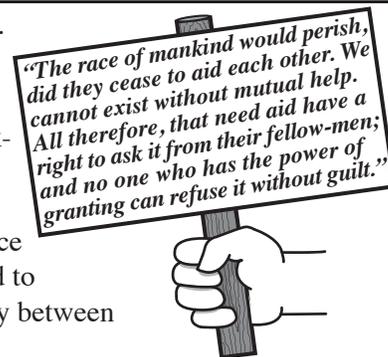
→ A failure to work with our customer to develop a protocol for the transfer of work from one department to the next, and how and who would approve the transfer.

→ A failure to set-up regular training and cross training programs between department personnel and customer personnel, to develop a more pragmatic understanding of the limits and current constraints on each process.

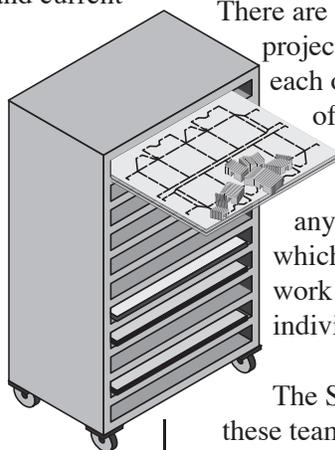
→ A failure for establishing a customer-supplier team from both departments to regularly discuss and find solutions to problems, issues, and

non-conformance.

→ A failure to appoint one person and a back-up in the department to act as customer-service representative and to coordinate activity between each department.



This organization structure may seem overly complex, but particularly because these are internal processes, because the people involved are working side-by-side, and because everyone has a basic understanding of each process, implementation is relatively easy, and daily execution is simple.

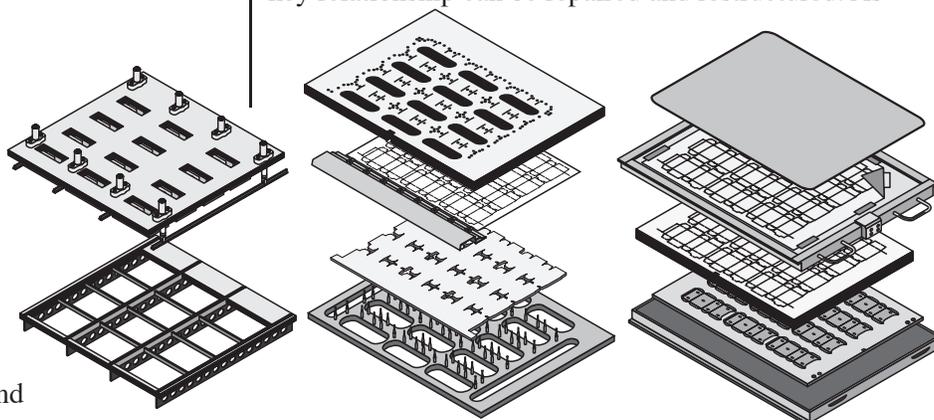


There are more than twenty five key sections in this project, and while it is not essential to implement each one completely, there are certainly elements of each section which are critical to the productive performance of the entire organization. The Customer-Supplier chain in any organization is the key operating structure which helps every department, which helps every work team, and which ultimately helps every individual to succeed.

The Supplier-Customer relationship between these teams is ineffective in the majority of organizations, and guess what, performance suffers!

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

There are several levels and several ways in which this key relationship can be repaired and restructured. As



The ABC's of Fast Diecutting Press Changeover!

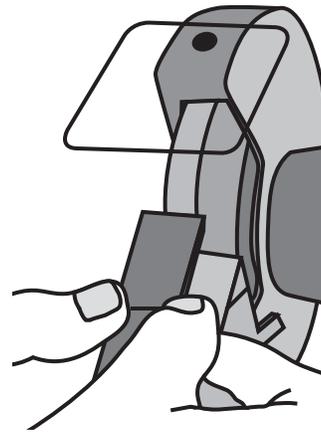
least disruptive ways to improve the process. Therefore, the teams should focus upon the following issues, as the first step in solving key technical problems. These would include:

- 1: Steel Rule Die Calibration
- 2: Steel Rule Die Pressure Balancing
- 3: Diecutting Pressure Management
- 4: Diecutting Pressure Leveling
- 5: Progressive Toolmaking

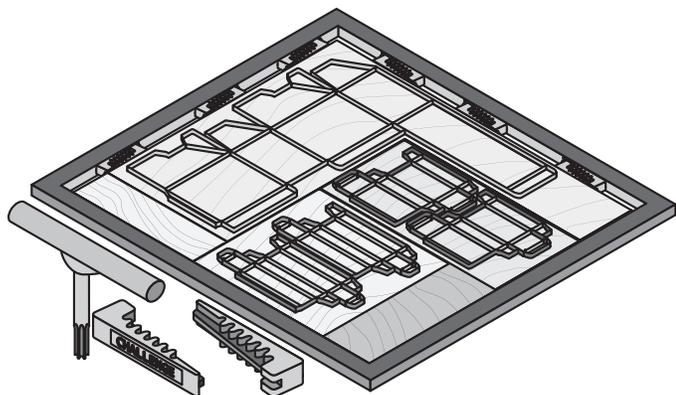
Why Knives Get Damaged?

Warped Dieboard
 Knife Intensity
 Incorrect Knife Type/Bevel
 Tool Handling
 Mixed Batch of Knife
 Chase Bolts Protruding
 Damaged Chase
 Bowed Tight Lock-Up
 Drilling Bolt Holes
 Non Pressure Balanced Die
 Patch-up/Tool Shimming
 Kerf Too Tight
 Non Calibrated Die
 Make-Ready Number
 Compressive Edge Damage
 Press-To-Press Move
 Non-Calibrated Press
 Damaged Cutting Plate
 Incorrect Platen Gap
 Non Sequenced Material

as a press changeover team member. This will provide the diecutting team with an experienced toolmaker, who can participate directly in problem solving and process improvement. In addition, involvement in the day-to-day activities of Pre-Press & Diecutting, will provide the training and the experience, which will drive process improvement. This may seem to be a capitulation in terms of the goal of bringing the two processes closer together, but by selecting the right individual, significant progress will be made, and progress which will foster the eventual amalgamation of the Diemaking, Pre-Press, and Diecutting disciplines.



This is an ambitious project, and certainly the faint of heart will pull back from the integration of Pre-Press and Diemaking. However, this is not only the most logical organization structure, it is the most effective in terms of productivity, training, costs, and speed.



INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

To constrain the scope of the project, however, without detracting from the potential to improve performance, there is a smaller version of Diemaking and Diecutting Integration which will prove less cumbersome to implement and to administer.

The formation of the team should continue, however, instead of involving all of the diemaking personnel, ask for a volunteer or preferably choose one of the process improvement team, and move one diemaker into pre-press. This cross-over position would be a multi-functional role, with activity as a diemaker, as a pre-press technician, and

The Goals of Diemaking & Toolmaking Organization:

“Organizations can never be a substitute for initiative and judgment.” ~Louis Dembitz Brandeis

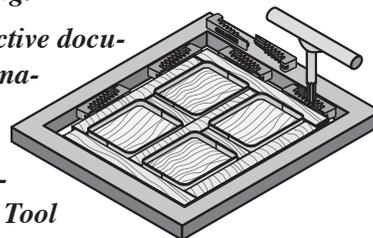
Amalgamation is a tough project because there are many perceived and real barriers to taking this quantum step forward. The benefits however, are significant, and the alternatives, are to stagnate and to fail. All of the goals carry significant benefit, and although the challenge is considerable, and the objections will be many, this is a project with tremendous productive potential.

“If a house be divided against itself, that house cannot stand.”
 New Testament, Mark 3:25



The goals include:

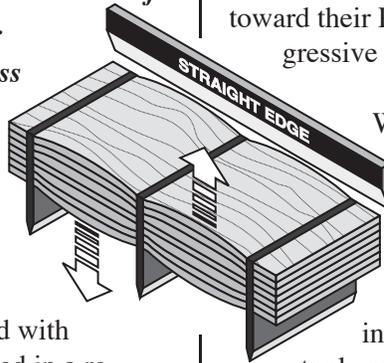
- **Breaking through the barriers to significant productive improvement in diecutting.**
- **Building an essential, a cooperative, and a productive Supplier-Customer partnership between Diemaking and Diecutting.**
- **Teaching diemakers diecutting and to teach diecutters diemaking.**
- **Developing an effective documented Tool Information Analysis, Tool Specification and Converting Parameter Selection, and Tool**



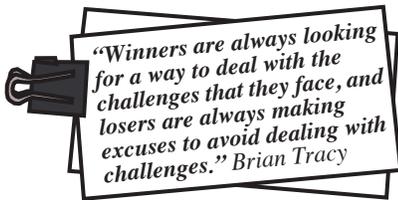
DIEMA KER BILL SMITH	JOB 0123 550" 2 Pt.		JOB 0124 720" 2 Pt.		JOB 0125 910" 2 Pt.		JOB 0128 380" 2 Pt.		JOB 0129 940" 2 Pt.		JOB 0127 890" 2 Pt.		JOB 0126 480" 2 Pt.	
	THROUGHPUT PER HOUR												108.5" HOUR	
TOTAL RULE INSERTED	560"	760"	990"	400"	960"	910"	510"						5,090" SOLD	
TOTAL RULE CONSUMED	720"	850"	1110"	500"	1090"	1070"	670"						920" WASTE	
RULE WASTE PERCENTAGE	28%	11%	12%	25%	14%	18%	32%						20% WASTE	

Design Procedure.

- ➔ *Developing an effective, documented Tool Machining, Tool Fabrication, and Tool Finishing Procedure.*
- ➔ *Providing the foundation for more effective Single Minute Exchange of Die. (SMED)*
- ➔ *Achieving Fast Press Changeover, by eliminating the various converting tools as the source of technical problems and limitations.*
- ➔ *Solving and eliminating key on-press tool related problems which currently generate slow speed, and low yield.*
- ➔ *Making diecutting faster, simpler, better, and lower cost.*



These represent very achievable goals, and with the right focus, goals which can be achieved in a remarkably short space of time. Certainly, this project represents a significant change in the traditional work structure for Diemaking, for Pre-Press, and for Diecutting. However, we face considerable commercial challenges, and it is time to meet the challenge head on.



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Diemaking & Toolmaking Organization: Methods & Practices

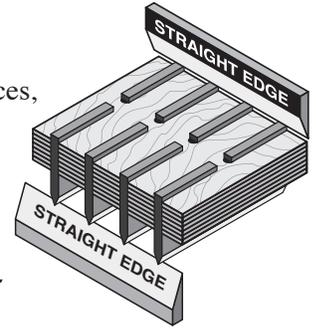
"Our life is frittered away by detail. Simplicity, simplicity, simplicity!" ~Henry David Thoreau

The basic goal we have just stated is to get these teams together, to get them talking, and to get both teams to accept the responsibility of on-press success as a mutual responsibility. Experience demonstrates that when diemakers and diecutters cooperate in a common goal,

common good ensues.

In terms of methods and practices, it is vital to break down whatever barriers exist to working together, therefore we need to implement:

- ➔ *Teambuilding and Teamwork*
- ➔ *A Customer-Supplier Relationship*
- ➔ *An Analysis of Key Diecutting Activities*
- ➔ *An Analysis of Key Diemaking Activities*
- ➔ *Cross Training & Job Swapping*
- ➔ *An Inclusive Job Postmortem*



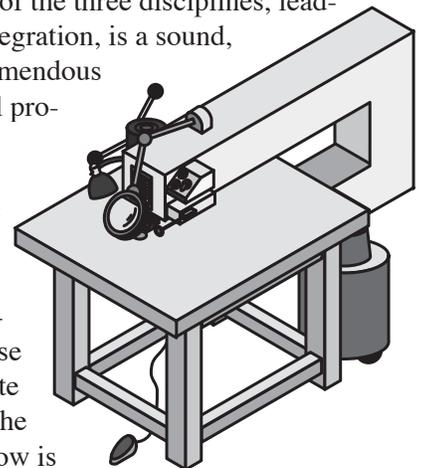
We simply need the Diemaking Team to behave toward the diecutting operation as any innovative business would toward their Primary Customer, and implement an aggressive and genuine Customer Service Focus.

We simply need the Diecutting Team, to regard the Diemaking Team as their Primary Supplier, and implement an aggressive and a progressive Supplier Certification Program. These programs are the minimum requirements for the business interaction between the tool supplier and the tool user, irrespective if the diemaking operation is in-house or is a remote commercial operation.

This is simply Business 101, and we need to implement methods and practices, which get us back to a sound basis for doing business!

In discussing a long term strategy for Diemaking, Pre-Press and for Diecutting, the recommendation of an initial partial integration of the three disciplines, leading to eventual full integration, is a sound, viable option, with tremendous opportunity for radical productive improvement.

Those who have made this change, would never return to the traditional ways of doing things, and for those who would contemplate this change, consider the following question. How is



The ABC's of Fast Diecutting Press Changeover!

it working now and how easy is it to generate productive improvement?

Diemaking & Toolmaking Organization: The Benefits of Change

"Obviously, the highest type of efficiency is that which can utilize existing material to the best advantage."

~Jawaharlal Nehru

We have a fractured relationship between the Internal and the External Diemaking-Toolmaking Suppliers and the Internal Diecutting-Converting Operation. The primary benefits of change is if we put that relationship back onto a professional business footing, only then will we generate the degree of progressive improvement essential to survive in the current marketplace.

Diecutting is a Toolmaking Process. Statistically, Eighty Percent (80%) of non-productive time in Press Changeover and Press Production is expended in working and continuously reworking the tools on-press. Added to this, is the majority of Quality Problems and the majority of material waste, can be directly linked to a breakdown in the performance of the tools.

Can this be any clearer?

The benefits of changing this relationship to a professional, cooperative partnership, is the diecutting process will get faster, it will get easier, it will get better, and it will dramatically lower operating costs.

Can this be any clearer?

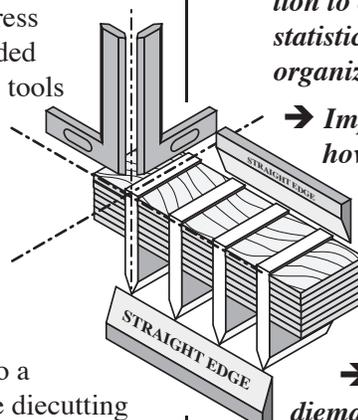
Diemaking & Toolmaking Organization: Recommended Actions

"A man who works with his hands is a laborer; a man who works with his hands and his brain is a craftsman; but a man who works with his hands and his brain and his heart, is an artist." ~Louis Nizer

I would imagine you are still contemplating the fall out from integrating Diemaking, Pre-Press, and Diecutting. But that is in the



"Production is not the application of tools to materials, but logic to work."

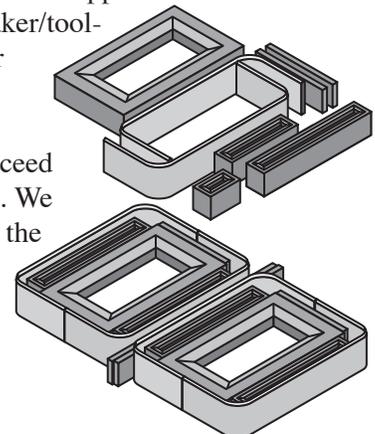


future, and it may be a future you decide to enact. But we have to do the basics, so my suggestion is to do just that, at this stage implement the following actions.



- ➔ ***Form a Diemaker-Diecutting Converting Improvement Team and get them together to describe the project, to outline the potential benefits of the change, to discuss the obstacles and challenges, and to brainstorm methods and practices for starting the project.***
- ➔ ***Complete a Key Result Analysis of Press Changeover & Make-Ready to ensure we have accurate, up-to-date, and statistically sound data on which to plan and to organize the project.***
- ➔ ***Complete a Key Result Analysis of Press Production to ensure we have accurate, up-to-date, and statistically sound data on which to plan and to organize the project.***
- ➔ ***Implement comprehensive documentation of how we complete the first three phases of tool manufacturing. 1: Information Collection & Analysis; 2: Tool Specification & the Selection of key Converting Parameters; and 3: The Design and Integration Procedures for every tool.***
- ➔ ***Having one or more key members of the diemaking team take an active role in several changeover sequences, to ensure they have a clear picture of the problems in press make-ready.***

These simple, straightforward and logical steps will provide everyone involved with a more accurate picture of the problems we face and the opportunities we have. We simply need the diemaker/toolmaker to understand his or her customer process, and to design and fabricate a tool which will meet or exceed his customer requirements. We have successfully upgrade the technology of diemaking, now we need to upgraded our professional services to match.



Section Seventeen:

Diemaking & Toolmaking Organization: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ As an apprentice in England I spent three years focusing upon the entire converting process, (specializing in diecutting), before I was certified, ready to begin the final two years of my apprenticeship, specializing in diemaking training. The underlying philosophy was sound, simple, and applied rigorously. ***“If you wish to become a professional diemaker, you must first achieve and prove competence in every element of effective diecutting. If you wish to become a professional diecutter, you must first achieve and prove competence in diemaking and toolmaking.”***
- ✓ Diecutting is a toolmaking process, and statistically the majority of changeover time and lost time during production is expended working on the tools. Clearly, either the tools were not correct in the beginning, or they have to be continuously reworked to complete the production cycle.
- ✓ The major problem is the separation and isolation of diemaking from the Pre-Press Discipline, from Press Changeover, and from Press Production. The diemaker is not involved, they are not part of the diecutting problem solving or process improvement process, and they are not seen as being partially responsible for the ineffective on-press performance of the tools they designed and created.
- ✓ The diecutting press is simply a toolholder, and although the competence of the press technician is critical to success, he did not specify, design, or fabricate the tool, and he is putting all of his faith in a diemaker who has a rudimentary knowledge of diecutting, at best?
- ✓ It could be that the on-press changeover and production issues in your operation are the result of poorly trained press operators, but this must mean

every operator in every company is poorly trained, because the national press yield is so abysmally poor? Is it possible the tool is not properly specified, designed and effectively manufactured for the on-press application?

- ✓ James Anthony Froude explained the next problem perfectly, when he said; ***“Instruction does not prevent waste of time or mistakes; and mistakes themselves are often the best teachers of all.”*** But how can we possibly learn from any mistakes or opportunities to improve the way we make our tools if we are not actively involved in the diecutting Close-Out-Loop? If the diemaker does not see or get feedback on the performance of the tools he or she made, how can they possibly improve?
- ✓ The greatest problem facing the commercial and in practice, the in-house diemaker, is the solid perception that tools are commodity prices. No toolmaker agrees with this, myself included, but the customer is always right, and they are simply saying, no matter which company I purchase tools from, I see no rise in productive output! Of course, as all diemakers will tell you, the customer is wrong!
- ✓ It is easy to take cheap shots at any group, there are enough productivity problems to go around, but there is too much evidence to dismiss poor diecutting performance, as the inability of the customer or the diecutter to manage their own process. And if we are so confident, why do we attach a label which states we have no responsibility for the tool after the first impression? Imagine the auto salesman yelling this after you as you drive away from the dealership. “Hey, you are on your own now!” Now there is confidence, there is integrity, there is world class customer service. Yes you are right. ***This does not make sense!***
- ✓ You may be able to pick holes in some of these arguments but the preponderance of evidence is that the tools the diemaker designs and fabricates are simply not good enough to do the job!

Section Seventeen:

Diemaking & Toolmaking Organization: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Describe the benefits of a diemaker being trained in diecutting and a diecutter being trained in diemaking?
- ✓ What is the statistical percentage of press down time related to tool issues and to tool problems?
- ✓ Why do you feel this is happening?
- ✓ Do you see this problems as poor toolmaking or poor tool usage?
- ✓ Why do you think the diecutting press is so difficult to make-ready, and there is so much lost time in the production phase of the operation?
- ✓ Why do you feel steel rule dies and related tools are seen and are treated as commodities by the marketplace?
- ✓ What do you see the role of the Pre-Press discipline accomplishing?
- ✓ Do you see the pre-press discipline as a part of diemaking-toolmaking?
- ✓ What information does the professional diemaker use to improve the steel rule die and related tools?
- ✓ Name the three disciplines of tool design?
- ✓ Name the three disciplines of tool fabrication?
- ✓ What are the key converting parameters the section refers to?
- ✓ How do you currently verify the male and female tools match each other, and are precisely registered to each other?
- ✓ How do you focus on tool synchronization, and how do you pre-determine this key alignment is correct?
- ✓ How do you choose which knife to use in the steel rule die, and why?
- ✓ How effective would you describe the Supplier-Customer relationship between Diemaking and Diecutting?
- ✓ What documentation exists about the design and fabrication of all of the tools made in the diemaking department?
- ✓ Have you every been involved in a job postmortem in either diemaking and/or in diecutting, and would you see this as an advantage?

Manufacturing System of Organization

Section 18: Pre-Press Organization

Key Definitions: ... to take the necessary action to put something into a state where it is fit for use or action, or for a particular event or purpose ... origin ... Latin praeparare, from prae 'before' + parare 'make ready' ... to make ready beforehand for some purpose, use, or activity ... to work out the details of ... to plan in advance ... to make ready beforehand for a specific purpose ...

The Pre-Press Mission Statement: "It is the mission of the Pre-Press Team to comprehensively prepare for each press changeover, to assist the press operator in make-ready, and to conducted a close-out of each changeover, so that the benchmark standard for each changeover is progressively reduced, & the make-ready process is faster, simpler, and better."

Pre-Press Organization: An Overview

"An organization with an indispensable man is guilty of management failure." ~Harold S. Hook

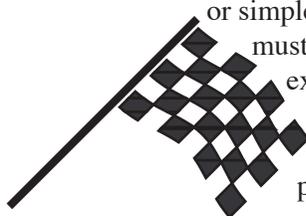
There are few technical limitations with changing any type of diecutting press over in less than 60 minutes. However, there are a multitude of organizational obstacles. It is a basic principle of modern presswork that a rigorous ongoing effort is made to convert every on-press activity to an off-press activity. This is not a technical challenge but an organizational challenge. The problem is, most companies have an inadequate pre-press system of diecutting manufacturing and as a result too many things are performed inefficiently on press. This approach to manufacturing is unnecessarily complex, it is difficult to manage or control, and it breeds operator complacency. Therefore, every company must begin developing some degree of a Pre-Press Discipline.

"Imagination is our strongest tool -- the ability to see ordinary things in new ways."
Keith Herrman



In an earlier section we discussed the introduction of the Single Minute Exchange of Die discipline. In this proven method of achieving fast tool changeover, the initial focus is upon converting Internal or On-Press Activities to External or Off-Press Activity. However, with no effectively organized pre-press discipline, even if it is only a single person, how can we move on-press activities to an off-press activities?

A pre-preparation discipline is essential for fast turn-around diecutting productivity. Large or small, complex or simple, the pre-press organization must meet the specific needs of the existing diecutting organization. This simply means everything that can be prepared before the production run must be prepared



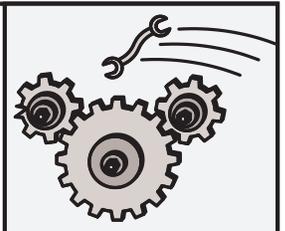
and verified before the production run. This also requires that everything that can be converted from an on-press activity to an off-press activity, must be converted. It does not matter if you have one press or twenty presses. When any press is ready for press changeover, everything must be ready, it must be in position, and it must be verified as ready for production, and a one-touch activation tool. .


He who has no taste for order, will be often wrong in his judgment, and seldom considerate or conscientious in his actions.

To consolidate fast changeover and guarantee efficient on-press performance, the pre-press area must be organized using the same principles with which the Pit Area is organized in auto racing. This means every tool, component, material, and piece of equipment, including information, must be in the right place at the right time and require minimal movement to access. In this scenario the press can be compared to a racing car, which is just entering the Pit Area for a fast service and a rapid changeover!

It is obvious that any press can be changed over from one job to another in minutes if all available personnel resources are formed into flexible, adaptive, Pit Crew Teams. But the Pit-Crew at a NASCAR Racing Event does not start preparation immediately before the race begins. What you see is the result of meticulous pre-preparation, precise qualification of every part, tool and component, careful organization and placement of everything needed for changeover, and extensive practice, practice, and then more practice.

(Manufacturing) ... excellence results from dedication to daily progress. Making something a little better every day.



The ABC's of Fast Diecutting Press Changeover!

DUTIES & RESPONSIBILITIES	
✓	Job/Work Analysis & Auditing
✓	Work Schedule, & Planning System
✓	Tool Design, Evaluation, & Verification
✓	Tool Calibrate, Press Prepare, & Synchronize
✓	ChangeOver Planning, & JIT Organize
✓	On-Press Make-Ready Coordinate
✓	Minimize Set-Up Time, & Down Time
✓	Maximize Yield, & Minimize Waste
✓	Process Control & Product Approval

What you see is no overnight success! If each NASCAR team had the stamina and the resolve of the majority of diecutting operations, they would give up after one race!

Being this well prepared for any form of changeover, requires a determination and a commitment to implementing and perfecting, practices and methods of set-up that work in every industry, including NASCAR racing.

This type of organization, and this image of a race car pit-crew team changeover, many are familiar with, is the fastest, simplest method of teaching everyone what must be done to generate productive, profitable diecutting.

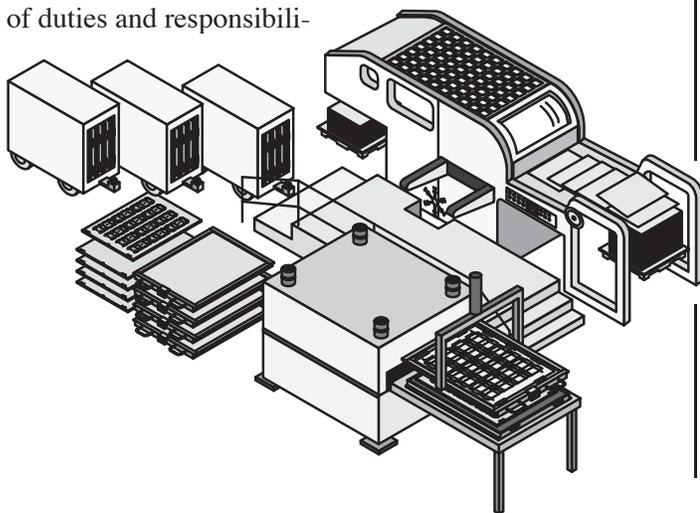
Pre-Press is simply getting each diecutter ready and prepared for the race, and then in keeping it running at maximum speed, with no breakdowns

Pre-Press Organization:

Problems & Solutions

“Often in our hurrying to get work done, we make even more work for ourselves. Take the time, make the effort, to do it right the first time, and you’ll have more time to do even more.” ~Ralph Marston Jr.

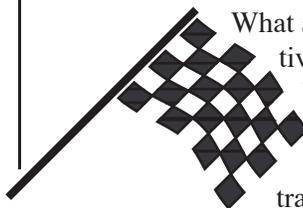
As you can see from the extensive list of duties and responsibilities featured on this page, the pre-press team can be a dynamic force providing much needed technical support to the often overworked press operator. The list of duties and responsibili-



“Press Make-Ready is the amount of time required to changeover, from the last qualified diecut sheet at maximum press speed, to the first qualified diecut sheet of the next job, at full press speed.”

ties also illustrates how simple the organization can be or how sophisticated. Many companies start small and expand the pre-press discipline as the team gains experience.

The difficulty we face as an industry, is either diemaking with the tremendous proliferation of advanced technology, and diecutting, with faster and faster presses, garners the majority of our attention. Strangely, the one area where diemaking and diecutting are tied together is in pre-press. It is highly illogical to separate diemaking and pre-press. Diemaking is about tool design and fabrication. Pre-Press is about tool fabrication and preparation. Almost identical disciplines, and yet, not only are both organized as separate and distinct disciplines, they are rarely close to one another, and the level of cooperative involvement is minimal.



What are some of the things an effective preparatory discipline would be responsible for? These would include work planning & data management and it would involve training and team development. It would include all elements of computer-aided tool design, fabrication, and finishing. It would include press changeover and make-ready. It would include production support and technical assistance to the press operations team. It would include responsibility for a systematic approach to maintenance and preventative maintenance. It would involve problem solving and trouble-shooting, and it would involve research, development, and converting testing. It would include standardization, benchmarking, and time management. It would include supplier liaison and process integration; it would involve quality control and customer support, and it would include managing the system of safety.

Every diecutting operation has by default a pre-press discipline. There is always a degree of pre-preparation, no matter how haphazard and how inconsistently it is applied. Most professionals would admit that on-press difficulty and failure can be

DUTIES & RESPONSIBILITIES	
✓	System Maintenance & Technology Analysis
✓	Research, Development, & Documentation
✓	Training, Cross Training, & Process Improvement
✓	Progressive Benchmarking & Procedural Change
✓	Key Result Analysis, & Reporting Structure
✓	Problem-Cause -Solution-Innovation
✓	Tool Management, Rework & Storage
✓	Process Materials Inventory Management
✓	Job/Work Close-Out, & Process Postmortem

directly attributed to poor pre-production preparation. Unfortunately, it is not fair to initially expect everyone to be so experienced, that failure is completely eliminated. However, it is essential to recognize each press production cycle is a test, and therefore, an opportunity to identify weaknesses, to define problems, and to gain invaluable technical data and practical experience.

Unfortunately, this description brings us full circle to the basic problem. These are all important issues which are essential to be implemented if we are to make rapid and sustained productive improvement. The diemaker is not currently expected to share in this responsibility, and the press operator is to busy fighting fires to be consistently involved in remedial activity or in process improvement.

The bottom line? Pre-Press is essential to progressive improvement, to fast press changeover, to optimal speed and yield, to consistent quality and to low cost manufacturing. The questions is not if it is critical, the right question is how do we get started?

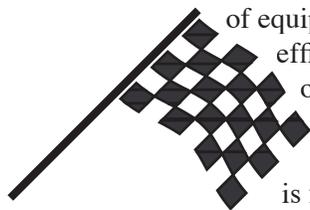
"The will to win is important, but the will to prepare is vital." Joe Paterno

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

The problem we face is we are mired in outdated tradition and in methods and practices which are the source of many of the problems we face.

Every person involved in diemaking, in pre-press and in diecutting, has been allowed to create roles with very strict lines of demarcation, and seemingly impenetrable barriers to cooperative involvement. When you have 10 people working in a press department, what difference does it make what role they play as long as every piece

of equipment is running at maximum efficiency? What is wrong with one person running or watching two presses. Sometimes if everything is running well this is fine, however, at other times it



STEPS TO SUCCESS

The SMED process improvement initiative begins by recognizing two key production organization analytical principles:

Make-Ready, Set-Up, or Press ChangeOver consists of two different disciplines:

- 1 INTERNAL SET-UP (On-Press Make-Ready)
- 2 EXTERNAL SET-UP (Off-Press Preparation/Pre-Press)

The second step of the SMED improvement discipline is to recognize TIME as the most critical and volatile resource in manufacturing.

A reduction in standard time is the most effective method of increasing productivity. In standardizing every key activity the smallest unit of time work is:

1/10th of a Minute or 6 seconds

The third step requires distinguishing between INTERNAL, (On-Press) Set-Up, and EXTERNAL, (Off-Press or Pre-Press) Set-Up.

The fourth step requires focussing the entire work team to convert On-Press Make-Ready activities to Off-Press or Pre-Press Activities.

This discipline requires using statistical analytical tools, such as Pareto Analysis, to break down the INTERNAL On-Press make-ready operation into distinct steps or separate press set-up activities.

What is On-Press Make-Ready?

The SMED improvement process continues by focussing upon EXTERNAL or Pre-Press Set-Up.

This is critical to long term success as consistent fast, precise, on-press make-ready, diecut product quality, optimum press speed and maximum yield, and the overall cost of manufacturing are all a function of how effectively the Pre-Press discipline is organized.

To begin organizing or reorganizing the Pre-Press function it is critical to develop a sound operating structure and to break the discipline down into separate steps or logically grouped activities.

is not effective. What would happen if the diemakers and the pre-press technicians were designated and comprehensively trained as Preparatory Tool Technicians, and formed flexible teams to assist in press changeover, and in running the presses?

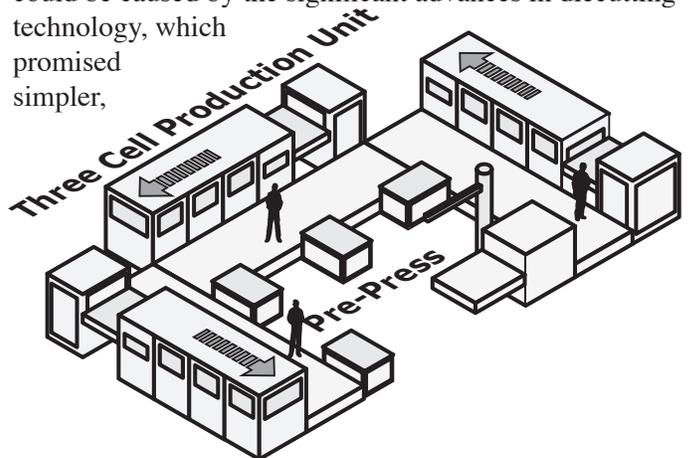
We have inadvertently created a system of working which is illogical; it lacks genuine teamwork; it lacks flexibility; it certainly lacks responsibility; it fails miserably in terms of cooperation; and it does not encourage the talent we have to flow to the point of greatest need. Let us be honest, we are not currently involved in a progressive daily dialogue with each other about solving the pre-press dilemma.

At the end of each day it matters little what your job designation is, if the company has failed to maximize pro-

ductivity, if it has failed to generate super quality products, and if it has failed to exceed customer requirements, we have to change to be competitive in this aggressive economy!

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

The problem is, we have failed to adjust to a changing marketplace, and we are continuing to fall behind the speed and low cost curve. This may be caused by an explosion of new technology in the diemaking process, which held the promise of greater productive output. It could be caused by the significant advances in diecutting technology, which promised simpler,



The ABC's of Fast Diecutting Press Changeover!

THE PRINCIPLES OF PRE-PRESS ORGANIZATION

	<i>Racing Pit Crew Team Approach</i>
	<i>Compete Against The Clock</i>
	<i>Emergency Room JIT Organization</i>
	<i>Research, Education, Teaching, Training Focus</i>
	<i>Detail Preparation, Meticulous Close-Out</i>
	<i>Driver/Operator Support Swatt Team</i>

faster processing. However, while these expectations were somewhat unrealistic, rapid and extreme changes in the length of production runs, and the concomitant increase in press changeover, has severely stretched an already stressed organi-

zation structure.

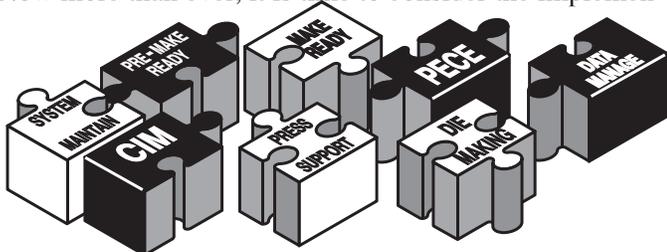
The primary cause of the problem of matching productivity to market need is the rapid acceleration in higher commercially driven performance standards in almost every element of converting manufacturing and supply. The need for faster turnaround and increased speed to market, exposes the inability of a traditional diecutting operating structure to quickly respond to meet emerging needs. The demand for greater flexibility, for precise delivery schedules, and for lower prices, demonstrates clearly, the current methods of organization the diecutting operation are simply not flexible enough, nor are they responsive enough to meet emerging and still changing needs.



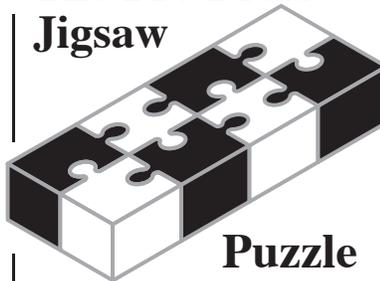
SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

As an industry, in the majority of cases, we have never taken pre-press seriously enough to make it an effective force for productive control and change in diecutting. As a result we have either underestimated the power of this discipline to drive productive improvement in diecutting, or simply, we have not completely understood the role of a pre-press discipline in diecutting converting.

Now more than ever, it is time to consider the implemen-



The Pre-Press Jigsaw



Puzzle

tation of some form of a pre-press discipline as a catalyst for radical change in the diecutting system of manufacturing. Therefore, we need to consider some or all of the following options:

→ *The first step in any new project must be to form a Pre-Press Converting Improvement Team, and get them together to describe the project, to outline the potential benefits of the change, to discuss the obstacles and challenges, and to brainstorm methods and practices for starting the project. This team should include a minimum of one person from CAD Design, from Diemaking, from Pre-Press, if there is a person fulfilling that role, and from the Press Team.*

"Expect the best, plan for the worst, and prepare to be surprised."
Denis Waitley

→ *The first item of the agenda is to find out what is required to complete off-press preparation for press make-ready, and what happens on press during press changeover.*

→ *To complete this task we should select one member of the Pre-Press Team to conduct this investigation. This will probably require one to two weeks depending upon the scale of the diecutting operation, and the analysis should be a full time activity.*

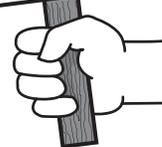
→ *The analysis will require collecting all current information, checklist, and guidelines used for planning, organization and preparation for an on-press changeover.*

→ *The information can be collected using a SMED worksheet outlined on page 238, it could also include interviews, to gain a more comprehensive view of the pre-press discipline, and it can include video-taping.*

→ *The information should be organized and prepared for another Pre-Press Converting Improvement Team Meeting.*

→ *A second meeting should be*

"If we learn for each success, and each failure, and improve our selves through this process, then, at the end, we will have fulfilled our potential and performed well." Dr. Ferdinand Porsche



THE PRE-PRESS MISSION

PLANNING & ORGANIZING <i>The ability to prepare, respond & change quickly.</i>
HUMAN RESOURCE DEVELOPMENT <i>Continuously Educate, Learning, Training & Coaching.</i>
INNOVATION & DEVELOPMENT <i>Advance product & process technology</i>
FAST RESPONSE TEAMS <i>Changeover & Problem Solving Support/Assistance</i>
PRODUCTION TOOL MANAGEMENT <i>Specification, Design, Inspect, & Synchronize.</i>
INFORMATION MANAGEMENT <i>Close-The-Loop & Learn from every Job</i>
ON-PRESS TO OFF-PRESS <i>Minimize On-Press Activity</i>
TEAMWORK <i>Performance Parity/Procedural Uniformity</i>
QUALITY CONTROL <i>Implement a System of Quality Management</i>
SYSTEM MAINTENANCE <i>Optimize Equipment, Tools, & Materials</i>

scheduled and at the meeting the information or the picture of current preparatory and on-press activity should be presented, with the caveat, that further analysis will add more detail and provide a more accurate overview.

→ The team should then consider a number of Pre-Press organizational Options.

*"If we do not discipline ourselves the world will do it for us."
William Feather*

→ The most appropriate way to organize this project is to start small and to start slowly. This would require appointing one person as the pre-press technician, and require that person to get involved in assisting the preparation of presses for changeover, in the most effective way.

→ During this period a Key Result Analysis of each make-ready should be implement, to provide a comparison between previous changeover benchmarks, and the impact of the activity of the new pre-press technician.

→ Part of this activity requires keeping a meticulous time sheet, primarily regarding activities and issues. As earlier, the SMED format on page 238 can be used, as this is specifically designed for this application.

→ After a minimum of two weeks of working as the pre-press technician, the technician should prepare and organized the information he or she has collected, and then a full team meeting should convene to review the results.

→ This meeting should ask, but not be limited to, the following questions.

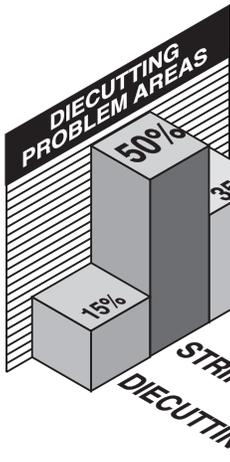
- ✓ What are the average man hours needed to fully prepare for each press make-ready?
- ✓ What do you estimate the impact of these pre-press activities are having on changeover and press production performance?
- ✓ How effective has the interaction been with the design team, the diemaking team, the press team, and others?
- ✓ Given the numbers of presses and the average number of press changeovers, how many people are needed to do this preparatory work effectively?
- ✓ What were the most frustrating issues or bottlenecks in getting each job ready?
- ✓ What tools, equipment, materials, resources, and space are required to complete the preparatory activity?
- ✓ Will the full implementation of a Pre-Press discipline make diecutting changeover faster, simpler, better, and less costly?

"He who every morning plans the transactions of the day and follows out that plan carries a thread that will guide him through the labyrinth of the most busy life... If the disposal of time is surrendered merely to the chance of incident, chaos will soon reign." Victor Hugo

PRE-PRESS CONVERTING TOOL PLANNING BOARD

JOB NUMBER	Work Planning	Steel Rule Die	Chase	Lock-Up	Nicking	Ejection	Patch-Up Sheet	Press Footprint	Counter/Matrix	Cutting Plate	Female Stripper	Male Stripper	Bottom Pins	Female Grid	Male Blanker	Embossing	Guillotine	Work Order	Printed Streets
	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM
	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM
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	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM	AM:PM

The ABC's of Fast Diecutting Press Changeover!



→ Certainly there are more questions to be asked of the technician by the team, and the entire team should instigate a series of meetings. These would be intended to review the initial findings, to gather more information, to gain time for more analysis, thought and feedback, to give all of the departments involved time to react to the project and to the minutes of the meetings, and to prepare for the decision making process.

→ The Pre-Press Converting Improvement Team should convene a meeting to determine the future of the Pre-Press discipline, and the What, Where, When, Who and How of this project.

If there is not pre-press discipline in place, the logical thing to do is to start small and to start slow, however, if a pre-press discipline exists, this is the time to review the operating structure of the discipline and to re-engineer the process to make it more effective.

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

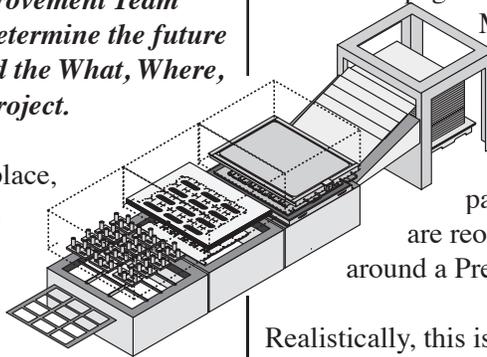
We have to make a long term strategic decision about Pre-Press at this point. Clearly the current system of diecutting manufacturing is not effective, nor is changing and improving. This is simply because the existing organization of CAD-Structural Design, Diemaking, Pre-Press, and Diecutting, all existing as separate and poorly

interacting Customer-Supplier relationships, are a legacy of a method of organizing and working, which is no longer effective.

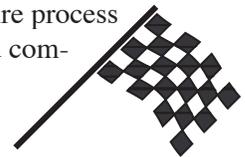
Every moment spent planning saves three to four in execution.

That we have to change is obvious. The important question is, how far and how fast? We have to set up a system of diecutting, which is not only better than we have now, more importantly, it is designed to change and improve on a daily basis.

Please take the time to examine the list of potential Responsibilities and Duties for the Pre-Press Team, outlined on page 234; please review the outline of Single Minute Exchange of Die, outlined on page 235; if you could review the Principles of Pre-Press Organization listed on page 236, and finally, if you consider the Pre-Press Mission on page 237; it is clear many companies are reorganizing their diecutting operations around a Pre-Press Hub.



Realistically, this is not an over-night phenomena but it is a practical method of making the entire process faster, simpler, better, lower cost, and competitive in a global economy.

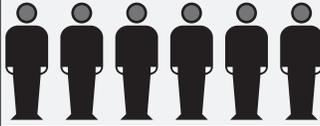


This represents a radical change from the traditional way of organizing each discipline under the diecutting umbrella. But as the current system of diecutting is not working effectively, it is vital to change, and it is important to choose a strategy, which is as responsive, as fast, and as adaptive to change as the markets we serve.

It is also important to note, that which ever system or model you adopt as a vision of the future, we still need

Press Changeover Analysis Worksheet: Date: _____ Team: _____												
Step	Description of the Activity or Action?	Activity Time?	Distance Travel?	Safety Signal?	Problems, Issues, Ideas, & Discussion Points?	Internal	External	What	Where	When	Who	How

TEAM PLAYERS



**TOOL DESIGNER
DIEMAKER
PRE-PRESS
PRESS OPERATOR
UTILITY MEMBER
GUEST (SUPPLIER)**

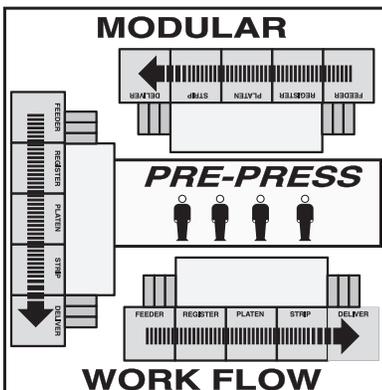
to start small and start slow, to give everyone time to assimilate the change in the way we are doing things. This does not mean compromise, it simply means we need to move at a pace the organization can match and master. So what are some of the innovative options we could consider in developing our plan of

action? These could include the following:

- ➔ *The basis for all of these changes is to form effective diecutting teams, whose measurement of success is press changeover and press production.*
- ➔ *The most obvious strategy, albeit a longer term effort, is to reconsider the layout of the diecutting presses to foster team work and to eliminate barriers to cooperative interaction. There are several layout options, from simply rotating one-press to the creation of the Modular and Integrated Layouts illustrated on this page.*
- ➔ *Integrate the Diemaking Team & the Pre-Press Team. This can be phased in two or three time periods depending upon the size of the diemaking operation and the numbers in the pre-press team. Each phase could take 6 months or more, and by integrating one or two team members at a time, everyone has time to adjust, and overcome inevitable organization problems.*
- ➔ *Integrate the CAD-CAM Team, the Diemaking Team & the Pre-Press Team. As previously stated this can be phased in gradually. However, as there*

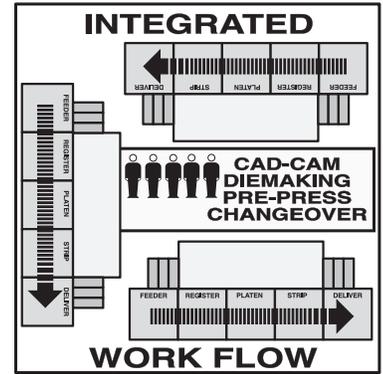
*“What we prepare for is what we shall get.”
William Sumner*

is only usually one or two people in CAD this can be phased in by integrating one person one day per week, and then two days per week, and then three days per week, etc. It may prove viable that the CAD Team are only



participants part of the time, however, their participation is vital to long term success.

- ➔ *As these changes are being gradually implemented, it is important to form flexible changeover*



teams, to participate in press make-ready, as this is the focus of the amalgamation of the various groups. The organization of these teams and the allocation of man power resources to each or to a specific make-ready, should be a function of careful planning and of a aggressive make-ready close out evaluation. The organization discipline is PLAN-EXECUTE-CONTROL-EVALUATE.

- ➔ *The organization of off-press and on-press work areas for these activities must use the Hospital Operating Room-Just-In-Time organization principles described a number of times in a number of sections.*
- ➔ *The organization of press changeover areas for these activities must use the NASCAR Pit Crew Changeover discipline described a number of times in a previous segment of the manual.*
- ➔ *The changeover teams should adopt Single Minute Exchange of Die discipline, by first moving any Internal or On-Press Activity to an External or Off-Press Activity. The primary goal must be to minimize on-press down time, in any way possible.*



- ➔ *The changeover team should then concentrate on simplifying and streamlining Internal or On-Press activity, by creating and documenting new procedures, and by developing increasingly shorter benchmark time standards for each on-press activity.*
- ➔ *The changeover team should then concentrate on simplifying and streamlining External or Off-Press activity, by creating and documenting*

The ABC's of Fast Diecutting Press Changeover!



new procedures, and by developing increasingly shorter benchmark time standards for each off-press activity.

→ The ultimate goal must be

to create a unified department, which integrates Computer-Integrated-Manufacturing, Diemaking and Toolmaking, Pre-Press Preparation, and Diecutting. The primary focus is on executing the fastest make ready possible, and generating the highest press speed, with the highest yield. The secondary priority is Education. Gradually, relentlessly, and persistently everyone should be cross trained, or at least a core group, who can all swap roles and functions, based upon the daily production needs of the operation.

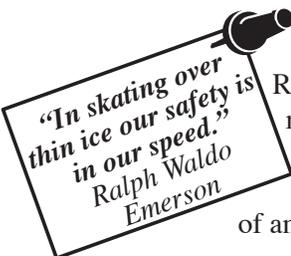
There are significant and radical changes, recommended to transform the current system of manufacturing, to a more responsive, a more flexible, and a more productive organization. This can and will work, however, it needs vision, leadership and a recognition, the market we serve is relentlessly excluding those who fail to be flexible, to be innovative, to be consistently, to be fast, and to be low cost.

The choice is yours, and the clock is ticking, and while these recommendations are different from traditional methods and practices, they reflect a future we can all achieve.

The Goals of Pre-Press Organization:

“Our real problem, then, is not our strength today; it is rather the vital necessity of action today to ensure our strength tomorrow.” ~Dwight D. Eisenhower

Given the proliferation of Medical Dramas in Movies and Television, and the explosion of interest in NASCAR and Open Wheel Auto Racing, the use of the Hospital Emergency Room, and the precision choreography of a high speed Pit Crew Changeover, are perfect and familiar examples of the goals of an effective Pre-Press Organization.

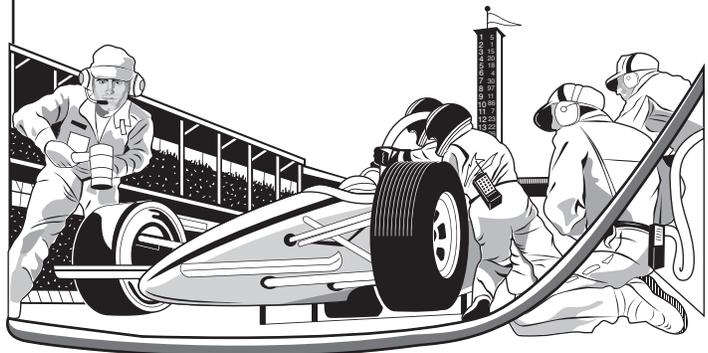
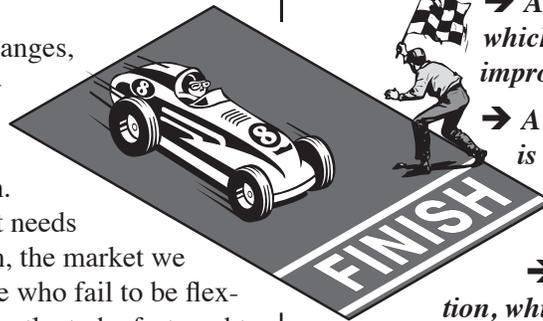


tion and of Fast Press Changeover. However, while they provide the perfect scenario for developing a vision for diecutting manufacturing organization, it is critical not to allow these images to obscure the vital changes to the current system of manufacturing. What are our goals in reorganizing Pre-Press in a limited fashion of in a comprehensive manner?

*“Speed has become an important element of strategy.”
Regis McKenna*

It is vital to create a Pre-Press service organization with some important operating characteristics. These would include:

- A Driven Organization, which is passionately focused upon Safety-Speed-Quality-Cost.**
- An Education Organization, which is dedicated to daily knowledge, skill, and experience sharing and consolidation.**
- A Self Regulating Organization, which is dedicated to daily performance improvement.**
- A Competitive Organization, which is dedicated to continually setting and surpassing industry leading performance benchmarks.**
- A Customer-Supplier Organization, which is dedicated to the seamless flow of world class converting products from original order, through every stage of the operation, to the end user of the product.**
- A Teamwork Organization, which is dedicated to respect, to appreciation, to praise, to the equality and the self esteem of every individual, and to team building.**
- An Innovative Organization, built around the principles of the team driven Problem-Cause-Solution-Innovation discipline.**
- A Strategic Organization, dedicated to meticulous**



Pre-Press Just-In-Time Organization Map Advantages

- ✓ A Documented fast Access Layout
- ✓ Simple to change, upgrade, & improve
- ✓ Fast Pre-Make-Ready Verification
- ✓ Save time, reduce fatigue, & stress
- ✓ Integrate Standard Operating Procedures
- ✓ Unification of best methods & practices
- ✓ Color-coded single source locations
- ✓ Greater efficiency in speed & precision
- ✓ Simplify training & skill development
- ✓ Fast consistent press changeover

pre-planning and pre-preparation, and to consistently executed close-outs and process postmortems.

If we are to survive, let alone succeed, we need to reinvent the diecutting converting organization around a Pre-Press Engine Room, which drives the operation forward and onward on a daily basis.

Pre-Press Organization: Methods & Practices

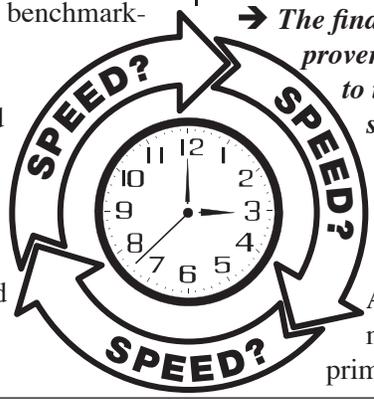
“Common sense is the knack of seeing things as they are, and doing things as they ought to be done.” ~Josh Billings

Currently, diecutting is an inefficient incremental process, poorly planned and rarely carefully evaluated, in which changeover proceeds slowly and inconsistently, and productive progress from one job to the next is painfully slow. We have to change to efficient Parallel Processing activities, in which many on-press actions are executed simultaneously, and the driving force is speed and benchmarking, research and education.

Using the organization principles espoused in these pages, Process Improvement is not a discipline we try to integrate into daily manufacturing, it IS the daily manufacturing process! So what do we need to change in terms of the current methods and practices? These changes would include the following actions:

memo:

“It is better to be prepared for an opportunity and not have one than to have an opportunity and not be prepared.”
Whitney M. Young, Jr.



➔ Use the principles of Single Minute Exchange of Die to define the critical difference between Internal or On-Press Activity and External or Off-Press Activity.

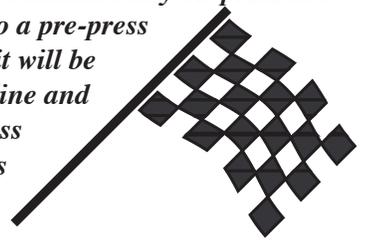
➔ To distinguish between the two activities of Internal & External Activity we need to monitor several press changeovers, to determine what is involved in preparation activity for each press cycle in the following areas:

“To be prepared is half the victory.”
Miguel de Cervantes

- ✓ Estimating & Scheduling
- ✓ CAD-CAM & Structural Design
- ✓ Graphics & Platemaking
- ✓ Diemaking & Toolmaking
- ✓ Pre-Press Activity
- ✓ On-Press Changeover Preparation.

➔ The primary focus at this stage is to review current practices and procedures in each of these disciplines, to determine how the preparatory activity could be modified to move any on-press activity to an off-press activity.

➔ The entire focus is to eliminate any on-press activity by converting it to a pre-press activity. Ultimately, it will be necessary to streamline and simplify both on-press activity and off-press activity, but at this stage our goal should be to concentrate on converting any on-press activity we can to an off-press activity.

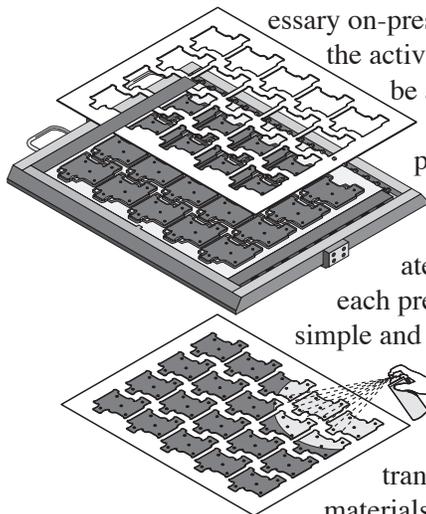


➔ The next step is to complete a number of Key Result Analysis of On-Press Activity, to determine where time is allocated.

➔ The final step in this first stage of process improvement is to prioritize the KRA Analysis, and to isolate each discipline. The next step is to stabilize, streamline and simplify each discipline, with the goal of reducing on-press time and improving the execution of each discipline.

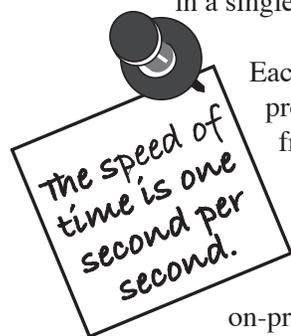
As you can see the initial series of recommended methods and practices concentrates primarily in eliminating or minimizing any nec-

The ABC's of Fast Diecutting Press Changeover!



essary on-press activity, by moving the activity off-press. This can be as simple as moving all of the carbon paper and other make-ready supplies, to the press immediately before the start of each press changeover. This simple and basic activity eliminates any on-press time in finding, qualifying and transporting supplies and materials to the press during

the normal make-ready cycle. Or it could be the pre-preparation of a specialized tool such as a counter mask. *See above.* This simple tool enables the counters to be pre-positioned on the die off-press, by pre-calculating the transfer pressure setting, and then by spraying adhesive and transferring all of the counter tools to the cutting plate in a single pass.



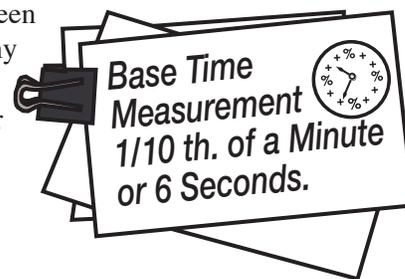
Each of these activities has been proven to save 5 to 10 minutes from every press changeover. However, by standardizing this type of preparatory activity, time can be saved from every on-press activity, off-press, and/or by simplifying the on-press activity to reduce the time required to execute the specific task on-press.

One minute here, three minutes there, 45 seconds off another activity, all accumulate and provide substantive reduction in on-press changeover time, particularly as each task or action is standardized and stabilized. The greatest challenge to the process improvement team is to think in terms of minutes and seconds and not in hours and fractions of an hour.

If we completed 10 press changeovers per week, and we only managed to cut five minutes from each changeover, this would mean a saving of 50 minutes per week, which is 2,600 minutes or 43 plus hours per year. Consider the practical and proven target for a team press changeover, for a sheet fed platen press, including full stripping



and blanking, is between 15 and 30 minutes, any comparison between these figures and your current make-ready time will demonstrate significant saving.

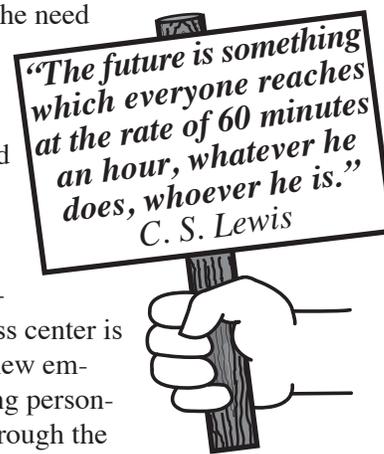


However, to reiterate everything discussed in this section, it is by attacking on-press time consumption, and by using the base time measurement of one tenth of a minute, or six seconds, as the measurement tool for every activity, we can relentlessly cut on-press make-ready time

Pre-Press Organization: The Benefits of Change

“What we anticipate seldom occurs, what we least expected generally happens.” ~Benjamin Disraeli

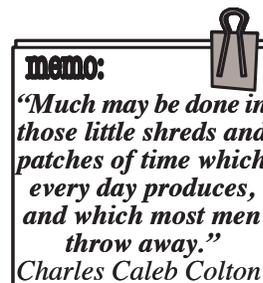
Although many accept the need for a well organized pre-press discipline, few seem to realize the multiple benefits derived from this professional approach to diecutting.



Throughout the converting industry the pre-press center is used for training, with new employees and all diecutting personnel regularly rotating through the department for a tour of duty. This is designed to teach new methods and procedures, to consolidate existing methods and practices, and to give every team member experience of both on-press and off-press activity. Naturally, pre-press is the perfect starting place for implementing the Training Map under the guidance of the pre-press training specialist.

The pre-press activity is used as the logical development nerve center for creating, proving, and integrating new or upgraded standard operating procedures. The pre-press discipline is the planning and scheduling control center for the entire diecutting and diemaking departments.

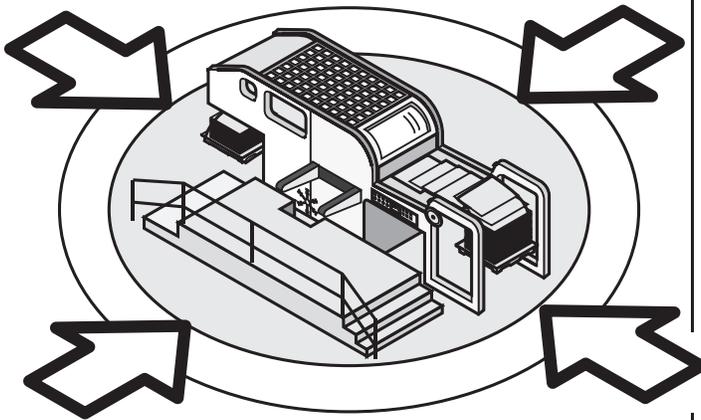
The pre-press discipline is the





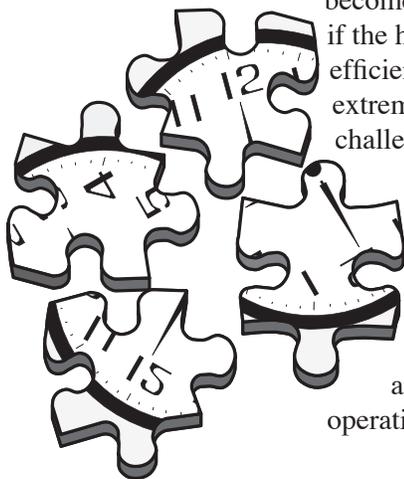
logical place to research, test, develop and innovate new materials, new tools, and new techniques. The pre-press center is the obvious control point for creating a technical data base and developing a powerful information management resource.

The pre-press center is the obvious place to provide Pit Crew assistance and technical support if the race car should unexpectedly enter the pits, or in the case of the diecutting press, experience a production stoppage. This also enables the pre-press team to conduct and to assist the press operator in problem solving and trouble shooting. The pre-press team should be assisting the press operator conducting a job close out, as this provides them the feedback they need to assess their preparatory benchmarks.



The pre-press center and the diecutting operation are often compared to the human heart and arterial system. If the heart is not working properly, the flow and the re-circulation of blood is slowed, and the body and the limbs

become sluggish. However, if the heart is aerobically efficient, the body and the extremities are fit to face any challenge.



Whether you have a single person or a team of people, the pre-press center is the heart of a productive and a healthy diecutting operation.

Pre-Press Organization:

Recommended Actions

“Thus a victorious army wins its victories before seeking battle; an army destined to defeat fights in the hope of winning.” ~Sun Tzu



While this can and should become a wide ranging, and significant change to the system of diecutting manufacturing, it can and should start small and start slowly. And of course, the reorganization can be suspended at any time, to allow the productive improvement to become a standardized part of the process, or simply because the process has maximized the potential of the organization available.

To summarize the recommended actions, they included:

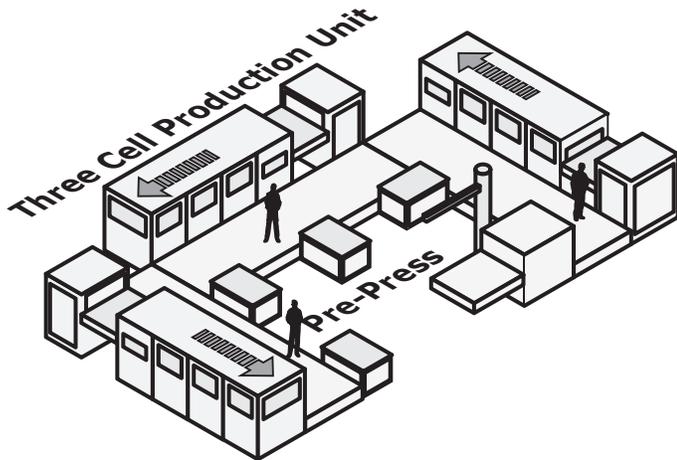
- ➔ *The first step in any new project must be to get the Administrative, CAD-CAM, Diemaking, & Diecutting teams together to describe the project, to outline the potential benefits of the change, to discuss the obstacles and challenges, and to brainstorm methods and practices for starting the project.*
- ➔ *Form a Pre-Press Development Team.*
- ➔ *Select one team member as the researcher and the auditor of the current system.*
- ➔ *Begin the analytical process by collecting all available planning and organization data related to pre-press and to press changeover.*
- ➔ *Observe, Analyze & List all On-Press Activity during several press changeovers.*
- ➔ *Observe, Analyze & List all Pre-Press Activity during several press changeovers.*
- ➔ *Observe, Analyze & List all preparatory activity during several press changeovers, in the following work centers:*
 - ✓ *Estimating & Scheduling*
 - ✓ *CAD-CAM & Structural Design*
 - ✓ *Graphics & Platemaking*
 - ✓ *Diemaking & Toolmaking*
 - ✓ *Pre-Press Activity*
 - ✓ *On-Press Changeover Preparation.*

“And when is there time to remember, to sift, to weigh, to estimate, to total?”

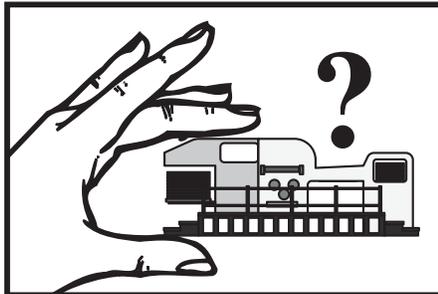
➔ *Inventory all tools, materials, supplies, equipment & components used in On-Press changeover.*

The ABC's of Fast Diecutting Press Changeover!

- Define the permanent and temporary storage locations for all of these items, and determine how they are checked and replaced after each press cycle.
- Inventory all tools, materials, supplies, equipment & components used in Pre-Press preparation.

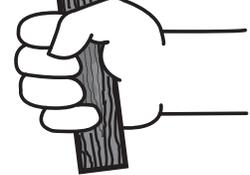


- Define the permanent and temporary storage locations for all of these items, and determine how they are checked and replaced after each press cycle.
- Inventory all information & technical data used in Pre & On-Press changeover.
- Determine What, Why, When Where, and How and by Whom the information is generated.
- Identify & inventory all safety devices, guards, supplies and tools.
- Complete a Floor Plan for the entire department and on a sheet of squared Mylar. All equipment should be plotted to scale on separate pieces and temporarily positioned on the master layout.
- Complete a larger scale floor plan for each Diecutting Press & the surrounding area, using the same techniques.
- List and define the roles of all of the current diecutting team members involved in both Pre-Press & On-Press Activity.
- List and define the roles of all of the Administration, CAD-CAM, Graphics & Printing, and Toolmaking personnel, involved in pre-press preparation activity.



- Develop a presentation of the information in a PowerPoint presentation to be presented to the Pre-Press Development Team.

“No man will succeed unless he is ready to face and overcome difficulties and prepared to assume responsibilities.”
William J. H. Boetcker

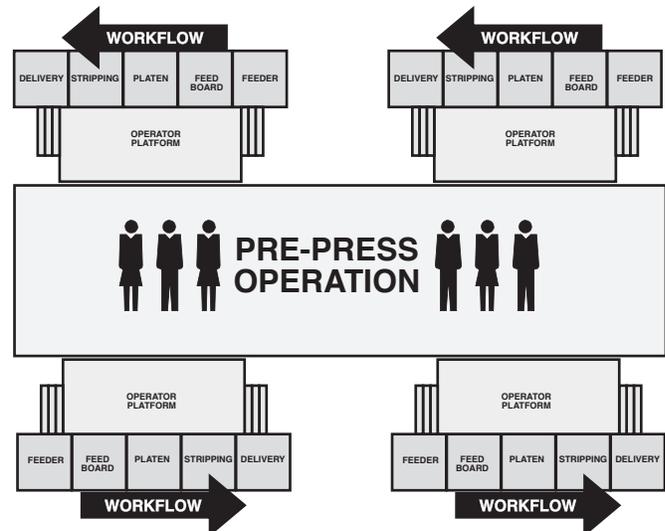


When this preparatory activity is combined with all of the other recommendations outlined in the Pre-Press Section, the Pre-Press Development Team can define a plan of action. Naturally, any plan should integrate contingency procedures and a regular review and revision of the plan as more information is gathered, and performance data evaluated.

This is an important project, which controls the productive future of the entire enterprise. The principles are simple. Organize with the meticulous detail of the Hospital Emergency Room, and execute Press-Changeover, with the energy, the competitive fire, and the teamwork of a NASCAR Pit Crew.

Each organization has different and often limited resources, and uses different diecutting technology. Therefore, each organization must develop a plan of action to reflect the type of work converted, the number of press changeover cycles per day, the availability of manpower resources, and

the market forces driving the company. As Joe Paterno explained; *“The will to win is important, but the will to prepare is vital.”*



Section Eighteen:

Pre-Press Organization: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ The bottom line? Pre-Press is essential to progressive improvement, to fast press changeover, to optimal speed and yield, to consistent quality and to low cost manufacturing. The question is not if it is critical, the right question is how do we get started?
- ✓ There are few technical limitations with changing any type of diecutting press over in less than 60 minutes. However, there are a multitude of organizational obstacles. It is a basic principle of modern presswork that a rigorous ongoing effort is made to convert every on-press activity to an off-press activity. This is not a technical challenge but an organizational challenge.
- ✓ The problem is, most companies have an inadequate pre-press system of diecutting manufacturing and as a result too many things are performed inefficiently on press. This approach to manufacturing is unnecessarily complex, it is difficult to manage or control, and it breeds operator complacency. Therefore, every company must begin developing some degree of a Pre-Press Discipline.
- ✓ A pre-preparation discipline is essential for fast turnaround diecutting productivity. Large or small, complex or simple, the pre-press organization must meet the specific needs of the existing diecutting organization. This simply means everything that can be prepared before the production run must be prepared and verified before the production run.
- ✓ Pre-Press preparation also requires that everything that can be converted from an on-press activity to an off-press activity, must be converted. It does not matter if you have one press or twenty presses. When any press is ready for press changeover, everything must be ready, it must be in position, and it must be verified as ready for production, and a one-touch activation tool.
- ✓ To consolidate fast changeover and guarantee efficient on-press performance, the pre-press area must be organized using the same principles with which the Pit Area is organized in auto racing. This means every tool, component, material, and piece of equipment, including information, must be in the right place at the right time and require minimal movement to access. In this scenario the press can be compared to a racing car, which is just entering the Pit Area for a fast service and a rapid changeover!
- ✓ When you have 10 people working in a press department, what difference does it make what role they play as long as every piece of equipment is running at maximum efficiency? What is wrong with one person running or watching two presses. Sometimes, if everything is running well this is fine, however, at other times it is not effective. What would happen if the diemakers and the pre-press technicians were designated and comprehensively trained as Preparatory Tool Technicians, and formed flexible teams to assist in press changeover, and in running the presses?
- ✓ The ultimate goal must be to create a unified department which integrates Computer-Integrated-Manufacturing, Diemaking and Toolmaking, Pre-Press Preparation, and Diecutting. The primary focus is on executing the fastest make ready possible, and generating the highest press speed, with the highest yield.
- ✓ The primary cause of the problem of matching productivity to market need is the rapid acceleration in higher commercially driven performance standards in almost every element of converting manufacturing and supply. The need for faster turnaround and increased speed to market, exposes the inability of a traditional diecutting operating structure to quickly respond to meet emerging needs. The demand for greater flexibility, for precise delivery schedules, and for lower prices, demonstrates clearly, the current methods of organization the diecutting operation are simply not flexible enough, nor are they responsive enough to meet emerging and still changing needs.

Section Eighteen:

Pre-Press Organization: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ How much of the current struggle to achieve consistent fast press changeover in your organization is a failure to prepare effectively?
- ✓ How would you describe the benefits to the press changeover discipline of organizing the pre-press activity by using the example of an efficient Hospital Emergency Room?
- ✓ How would you describe the benefits to the press changeover discipline of organizing the pre-press team activity by using the example of an efficient NASCAR Pit Crew Team changeover?
- ✓ Name and describe five of the Pre-Press team Duties & Responsibilities?
- ✓ How effective would you say the cooperation between CAD, Diemaking, and Pre-Press is in your organization, and how do you see the benefits in terms of on-press activity from a closer cooperative relationship?
- ✓ Does your organization practice very strict job responsibilities, and how effective do you feel your organization would be in adopting greater

flexibility in pre-press, in press changeover, and in press manning.

- ✓ Can you name the six organizational principles, which are used in creating an effective pre-press discipline?
- ✓ Can you name five of the ten organizational principles used to define the mission of the pre-press team?
- ✓ How effective are the CAD-CAM, Diemaking, Pre-Press, and Diecutting disciplines in terms of a Customer-Supplier operating structure?
- ✓ How would you think the Modular and the Integrated Workflow Press Layout would be greeted by your colleagues, and how would you describe the advantages of this approach?
- ✓ What impact would the conversion of current on-press activity to an off press activity have on press current changeover performance?
- ✓ Do you agree that the pre-press center would be the most effective place to organize and to coordinate team member training, and how would it work in your organization?
- ✓ What was the advice contained in this section about the speed of implementation and the comprehensiveness of the change to the pre-press discipline?

Manufacturing System of Organization

Section 19: Team Changeover

Key Definitions: ... a conversion, reversal, or complete change from one position, situation, or system to another ... a conversion to a different purpose or from one system to another, as in equipment or production techniques ... change from one thing, condition, or system to another, as in equipment, personnel, methods of production ... from running one product to another ...

The Changeover Mission Statement: "It is the mission of the pre-press team and the press team to changeover from the last qualified diecut sheet of the previous order, produced at maximum production speed, to the first qualified diecut sheet of the next order, produced at maximum production speed, in the shortest time and using the fewest man-hours possible."

Team Changeover: An Overview

"True freedom is not the absence of structure---letting the employees go off and do whatever they want----but rather a clear structure that enables people to work within established boundaries in an autonomous and creative way." ~Erich Fromm

It is vital to recognize that diecutting manufacturing is about research and testing, and while we have to meet output, quality and cost targets, we are continuously seeking faster, simpler, better and lower cost methods and practices.

The commercial market dynamic has changed considerably and continues to evolve at a difficult to manage pace. Diecutting is about shorter runs with a correspondingly greater number of changeover cycles, and a relentless daily competition against the clock. Unfortunately, our industry rarely utilizes more than 50% of the productive potential of existing diecutting technology, and we are in danger of steadily losing the Speed to Market race unless we are prepared to find radically better techniques and procedures. Complicating this challenge is the reality of working with less resources, less time, and less opportunity to recover from any mistakes or production bottlenecks.

The challenge we face, is we are struggling with traditional methods and practices, which although they can be marginally improved, lack the flexibility to make and to sustain rapid and continuous daily improvement. As it has consistently proven difficult to transform the current system of manufacturing into an efficient, and a productive diecutting operation, it is obviously necessary to consider

a different, and a more effective approach.

The keys to the new discipline are based around an understanding and the implementation of **Time and Motion and Just-In-Time Principles**, and an adoption of a more effective organization structure for preparation and execution of press changeover. These include the

discipline of organizing using the principles and practices implemented in a **Hospital Emergency Operating Room**, and by adopting the competitive team changeover principles and practices used in a **NASCAR or Auto Racing Pit Crew Changeover**. These can be, and they should be, implemented gradually, with daily practice improving performance and competence in

THE DIECUTTER TEN COMMANDMENTS

- To continuously search for the safest method of working.
- To fabricate tools, which precisely match customer needs.
- To develop the fastest, lowest cost, and most effective procedures.
- To seek excellence, through knowledge, skill and experience sharing.
- To format, calibrate and customize equipment, tools & work areas.
- To build a comprehensive personal and team information resource.
- To record problems, brainstorm solutions, & share innovation.
- To study, research & learn about all toolmaking & diecutting material.
- To develop competence in toolmaking and in diecutting processes.
- To foster teamwork and work as a team player.

these basic and very understandable disciplines.

An important element of making these changes must be a recognition that a meticulous and a continually improving preparatory checklist is vital to faster and simpler changeover. In addition, it is essential to accept that the diecutting press is merely a toolholder, and the foundation of effective diecutting is effective tool specification, design and fabrication of precisely synchronized tooling.

In practice, this requires a greater integration of the diemaker and the pre-press technician, and the primary architect of diecutting and toolmaking success, and the CAD CAM/Structural Design Team. Which brings us to the fundamental importance of teamwork in the new system of manufactur-

memo:
"The only way to reach your long range goals is through achieving your short range objectives."

The ABC's of Fast Diecutting Press Changeover!

PRESS MAPPING RECORD

Current Date?	
Press ID #?	
Test Die ID #?	
Chase ID #?	
Plate ID #?	
Last Calibrated?	
Operator?	
Operator?	
Operator?	
Mapping Number?	
Mapped by Whom?	
Other?	
Other?	

ing. The current method of press make-ready is primarily an *Incremental Process*, in which a series of predictable tasks are executed in a sequence, one after the other. This method of working is neither time efficient nor does it utilize available resources effectively. The alternative is the *Simultaneous Process*, in which a team of people,

with pre-determine duties and responsibilities, execute a series of pre-determined activities, in a coordinated and a choreographed manner, designed to changeover in 30 minutes or less!

Is this possible? Yes it is. Will it require change to the current system of manufacturing? Yes it will. Is it difficult to implement? It is not difficult to implement, however, it will take time for the work team to adopt, to accept, and to become adept in the new methods and procedures.

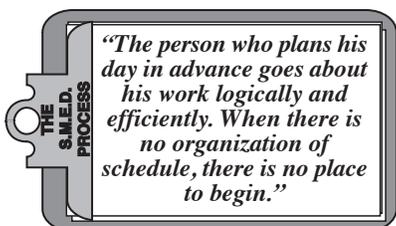
Realistically we have little alternative, but to adopt a system of manufacturing, which has demonstrated considerable productive advantages, over the current approach to diecutting manufacturing.

Team Changeover: Problems & Solutions

"Organizations are social beings and their success depends upon trust, subtlety and intimacy." ~William Ouchi

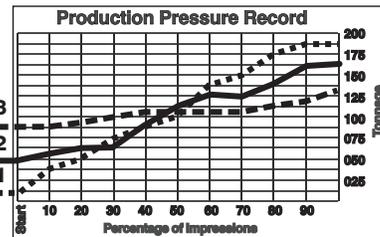
Insanity was famously defined as the repetition of the same action with the expectation of a different result.

But this is a perfect description of our struggle to do what we are doing now, but to do it twice as fast? It is not possible, nor practical, to muscle our way to higher productivity, we have to think our way to greater productivity.



To put it as bluntly as possible, this is the time to **Choose Your Attitude**. At this time we have little choice but to change, and it is

no longer simply a question of gradual improvement. If we are to survive we need to move rapidly, we need to move as a team, and we need to make significant short term improvement!



The fundamental failure in all of the many initiatives we have unsuccessfully tried is our continual resistance to work effectively as a cohesive team. The core of the problem is a combination of ego and a fear of change. We seem determined to sabotage our own future in the mistaken belief that by resisting progress, this will some-

how ensure our security. To achieve the goal of fast press changeover, it is essential to relinquish our hold on traditions, to abandon the status quo, and to eliminate lines of demarcation between outdated duties and responsibilities.

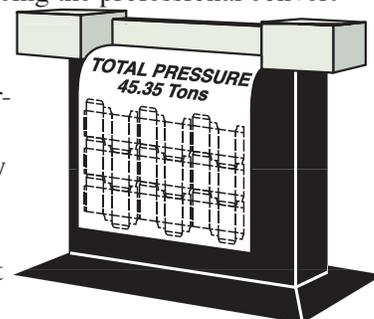
If we are to make rapid and radical improvement every method and practice must be evaluated for inclusion, and new and innovative techniques and procedures considered, in a search for a more efficient and a more effective system of diecutting manufacturing.

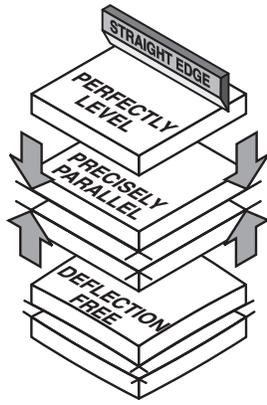
The mission, as previously stated is Safety-Speed-Quality-Cost, however,

in developing faster, better and less costly methods of converting, flexibility and teamwork must guide our search for speed in manufacturing.

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

The greatest challenge facing the professional converting operation is the lack of predictability in diecutting. Using the current operating structure, it is difficult to accurately predict and precisely schedule changeover time, press speed, output yield, throughput, turn-





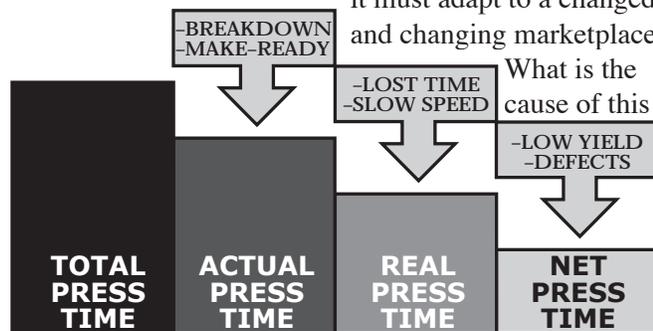
around, wastage operating cost, or a definitive delivery time. Compounding this problem is the complication that everyone is working in a different manner. Each person uses different methods and practices, and even these procedures are applied inconsistently by each individual. There is a lack of discipline, a lack of logic, a lack

of consistency, a lack of teamwork, a lack of technical communication, a lack of cooperation, a lack of pre-planning, and a lack of a production cycle close-out. This is an impossible system of manufacturing to control and to manage.

The very basis for productive improvement, stabilization, standardization, and simplification of procedures, makes process improvement and benchmarking an impossible task. These methods inhibit rather than promote learning, education, and skill development, and as a direct result productive progress is painfully slow. Adding to this dilemma is current practices and procedures cause press equipment and components to suffer rapid and serious damage.

The primary problem with the traditional diecutting operation set-up is there is no universally accepted plan of productive action, which represents the consensus of the entire team. And without teamwork, without consistently applied procedures, without daily benchmarking, without effective leadership, and without a unified vision of a more effective operating structure, diecutting organizations consistently struggle to improve.

Diecutting is a simple process. However, like all processes in any industry it must grow, it must change, and it must adapt to a changed and changing marketplace.



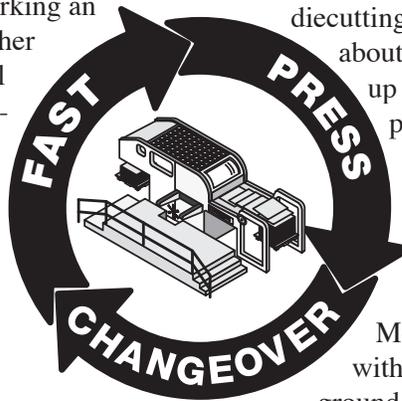
MANUFACTURING EFFICIENCY INDEX						JOB # : 1234/97		
	MAKE-READY		YIELD		LOST TIME		WASTE	
PRINT	45/90	194%	8,000/6,250	78%	90/130	145%	1,000/850	85%
DIECUT	90/138	154%	4'000/3,200	80%	60/87	145%	200/90	45%
GLUE	75/93	124%	45,000/29,000	65%	120/85	71%	2,500/4,300	172%
CARTON	120/95	79%	12,000/14,095	117%	90/75	84%	1,000/550	55%

problem?

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

If diecutting is a simple process, and our track record is slow and poor productive improvement, what is the cause of the problem?

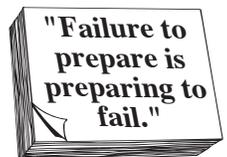
The first issue is the perceived and often real stress of teambuilding and the challenge of building a unified diecutting team. In principle everyone is positive about teamwork until they are required to give up one or more of their practices, and adopt procedures the entire team has determined is a more effective approach. This will often lead to confrontation and dissension, and will require a firm hand and determined leadership.



Most organizations have a history littered with failed productive initiatives which have ground quietly to a halt, for a variety of reasons.

This may be a lack of enthusiastic and consistent support from top management and key people throughout the organization. It may be the goals set for each initiative are unrealistic, they are attempting to change too much too quickly, and they are provided with inadequate logistical support for the desired outcome. It may be the team has run into inevitable early project problems and issues, and rather than attack the problems head on, the conflict exposes the lack of commitment to process improvement at every level, and the project collapses. It may be the team is unaware or made an unrealistic assessment of the commercial danger to the company and to job security, and are ambivalent about rapid productive improvement.

A classic excuse for failure is the statement: "Because we are so inefficient, we do not have the time or the financial resources, to attack the cause of our inefficiency." While this may be true this cycle must be broken by adding sufficient finan-



The ABC's of Fast Diecutting Press Changeover!

cial resources to the project to ensure the teams have the time to work on the project.

Finally, one of the key causes of failure in building an effective process improvement program is our inability to think laterally, and our reluctance to consider alternative strategies, that appear to wander too far away from conventional methods and thinking.

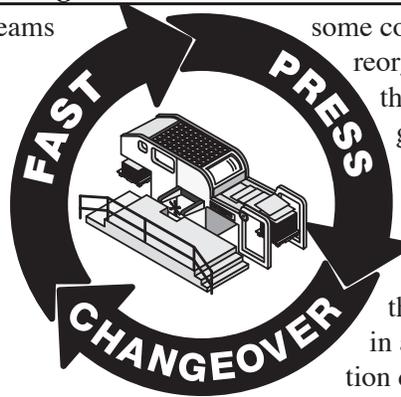
Most organizations understand the problem, and while they are generally accurate in their assessment of the cause, the obvious solutions often represent a radical change of direction which will be controversial, complex to implement in the short term, and difficult to sell to the diecutting work team. So what are some of the alternative strategies for rapidly improving press changeover performance?

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

memo:
"Destiny is not a matter of chance; it is a matter of choice. It is not something to be waited for, but rather something to be achieved."
 William Jennings Bryan

The potential solutions for press changeover are suggested in a graduated progression, from basic, to intermediate, to advanced. Simply stated these suggestions for organizational change range from those requiring minimal effort and disruption, and being capable of fast implementation, to those which require planning, training, and practice, and will require a longer term to perfect the skills.

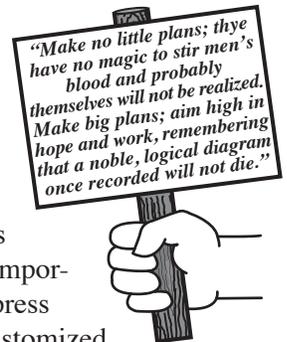
Using a variation on these different operating methods,



some companies start with the basic changeover reorganization and gradually progress through the other options as the workforce gains experience and confidence.

It is important to note all of these methods of press changeover are based upon a thorough re-organization of the press, the tools, the materials, and the supplies, in a Just-In-Time and off-press organization discipline. This principles and practices defined in earlier sections of the manual describing Time Management, Just-In-Time Organization, Single Minute Exchange of Die, Inventory Management, Simplification and Pre-Press Organization, will make a significant productive impact on press changeover, if nothing else is changed. However, when you consider the breakdown of None-Value Added Time as compared to Value-Added Time, contained in the diagram at the bottom of the next page, it is vital to customize the press and the work areas to make press changeover as simple as possible. Stabilize, Standardize, and Streamline.

So each of the alternative strategies that follow, all require a determined and dedicated attack on all of these critical issues, before we consider changing the operating structure of the on-press changeover activity. One further important point. Everyone involved in press changeover, must be wearing a customized tool belt which contains all of the commonly used tools required for press changeover. This simple, but critically important change to standard procedures will reduce Non-Value Added Time by a minimum of 10%.



Assuming we have completed the basic reorganization of the press and work areas, how can we reduce changeover

Press Changeover Analysis Worksheet: Date: _____ Team: _____						Internal	External	What	Where	When	Who	How
Step	Description of the Activity or Action?	Activity Time?	Distance Travel?	Safety Signal?	Problems, Issues, Ideas, & Discussion Points?							

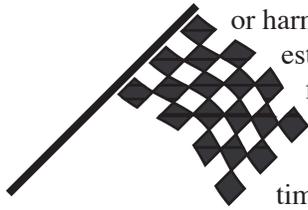
time?

I recommend eight (8) levels or re-organization strategies to reduce the time required to change a press from one job to the next.

Level One

This is simple, and the easiest to execute. Assuming we have completed all the work re-organization tasks specified on the previous page, we have customized the work areas, and we have eliminated the need to look for tools, components or supplies, then we proceed with a one person make-ready. This also assumes the use of a well organized tool belt

or harness. However, do not underestimate the importance of this first level of change, this type of re-organization has proven the ability to reduce changeover time by 15 to 45 minutes!

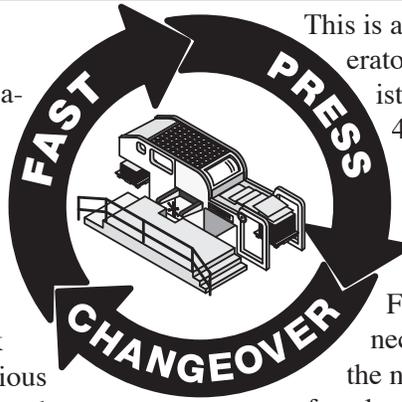


Level Two

This is one of the more common techniques used in Europe. Two crafts people in the department are selected as changeover specialists, and rigorously trained in all of the key techniques we have specified. Their primary role is to prepare for, to assist the operator, and to complete a technical close out of every press changeover. The information they collect, is obviously recycled and used to continuously improved standard methods and practices, however, all of this information is purged weekly and documented to ensure it is recorded and integrated into standard operating procedures.

An obviously important component of this position is training and retraining, and research and development, as they work to improve methods and practices, and assist the operator to develop more productive working habits. Generally, only one specialist is on duty at one time, while the other is running a press or working in a pre-press discipline, however, they should swap positions every two weeks. Naturally, the more technicians qualified to perform this function the better, and it should be a goal of this method to raise the knowledge and the skill of everyone involved.

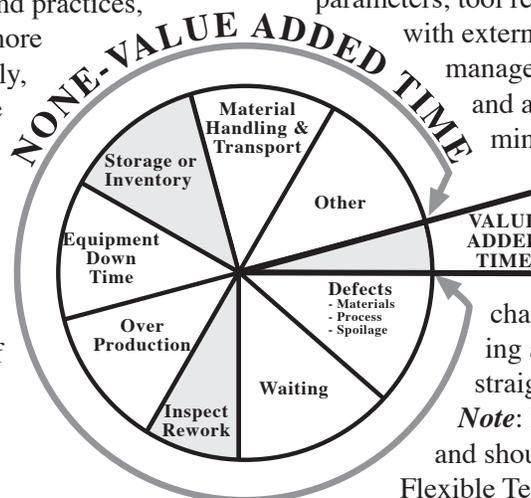
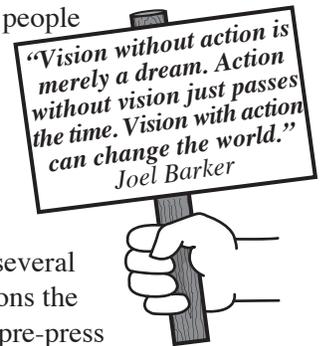
Level Three



This is a variation on Level 2 where the press operator is assisted by two changeover specialists. This can be accomplished by training 4 individuals, with two on-duty, and two ready to replace them on a two-weekly basis. The advantage of this approach is simply logistics.

For example, on a sheet fed press it is necessary to remove the old tools and install the new die and counter set, the male and female stripping tools, and the male and female blanking tools. If this is completed incrementally, and each takes consumes 15 minutes *Activity Time*, we have a total of 45 minutes *Elapsed Time*. However, with the operator and the two person changeover team, these activities are completed simultaneously or in parallel to one another. We still have 15 minutes *Activity Time* for each tool changeover, however, our *Elapsed Time*, or the press down time is only 15 minutes. In Single Minute Exchange of Die, this is referred to as Parallel Processing, which simply means a team of people are completing cooperatively several tasks at the same time.

The question is often asked; **“What are these people doing when there are no press changeover’s?”** There can be several answers to this. In most situations the changeover specialists are our pre-press team, and when they are not assisting in press changeover, they are closing-the-loop on a previous make-ready, and completing all of the extensive preparatory activities for the next several press changeovers. Naturally, there are many other duties including training and re-training, research and testing tool and converting parameters, tool rework and tool management, liaison with external and internal suppliers, information management and inventory management, and a host of other activities, designed to minimize on-press time.



Level Two and Level Three are one of the most common approaches to fast press changeover, as the process of building and creating the teams is relatively straightforward, and relatively painless. **Note:** Both Level 2 and Level three can and should be regularly augmented with a Flexible Team Changeover. This simply means

The ABC's of Fast Diecutting Press Changeover!

the team of one, or the team of two, has a fully participating guest participant in the make-ready changeover sequence. This should include regular participation by a CAD-CAM person so they can fully appreciate the impact of their design and specification decisions. This should include the diemaker, either an internal or an external diemaker, as this experience will forcibly demonstrate the strengths and weaknesses of each tool set, and provide first hand guidance in things to change to make the tools more effective. This could include a member of management, so they can fully understand and appreciate the challenge facing the press operators.

memo:

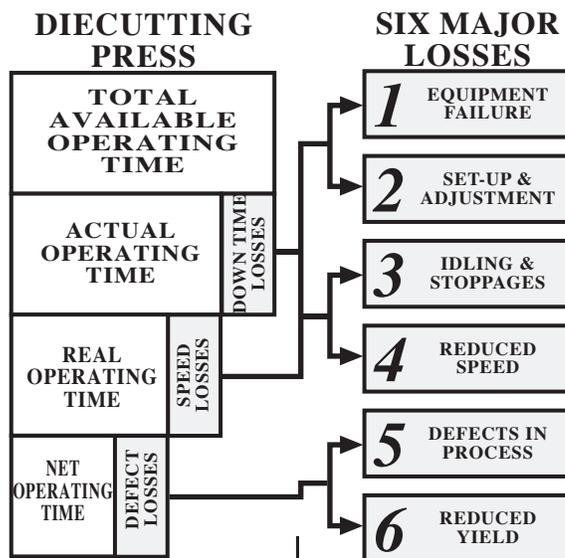
"The person who plans his day in advance goes about his work logically and efficiently. When there is no organization of schedule, there is no place to begin."

These experiences are valuable to the entire operation, as this training in this critical activity will enable everyone involved in the process to more fully comprehend the changeover battleground, and to be responsive and focused on the needs of the press team.

Level Four

This is where we begin to reorganize the workplace to more effectively utilize our manpower resources. The Traditional Workflow consisted of each press aligned in the same direction and often positioned side-by-side. This outdated layout of equipment creates barriers to cooperation, it prevents either operator responding to the needs of the other operator or to be able to monitor the press as it runs, and it undermines teamwork and the idea of shared responsibility.

In the Advance Workflow layout for presses, one of the presses is rotated 180 degrees, so the platforms of the two presses create a common working area between the presses. (This is most effective, when one or both of the press platforms are extended, to provide a more effective and a safer working environment for press changeover.)



This means the two operators form a team of two, whether by default or out of necessity. The changeover activity, unless both presses are in make-ready at the same time, is a cooperative venture, with long term analysis showing changeover to be a 1.5 person activity.

It is interesting to note that 30 or 40 years ago press operators were classified in two ways. Press Technicians, who could complete all the tasks in pre-press, and who could make-ready every press in the operation, and Machine

Minders, who were often in training or apprentices, whose function was to watch the press and deal with any production problem, after press make-ready was complete. In fact, if there was a production stoppage, which was complex to diagnose, the Machine Minder responsibility was to fetch a Press Technician who would fix the problem, provide some fast on-the job training, and who would return to his original duties.

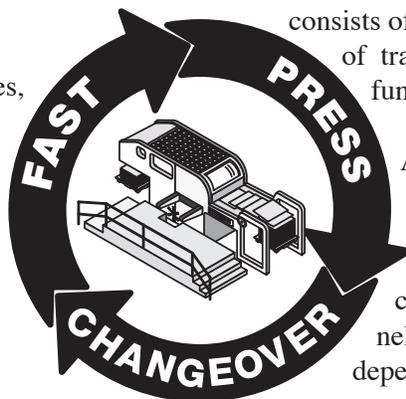
Most operations had approximately three Press Technicians to seven Machine Minders.

Naturally, this layout would be an advantage to the recommendations of Level One through Level Three.

Level Five

Level Five requires rotating two presses as before, however, in this attack on the system of diecutting manufacturing, sufficient space is left between the presses to accommodate a pre-press discipline. Often referred to as a Just-In-Time Work Flow, the manning of this work unit consists of three technicians, who after a period of training are cable of performing all of the functions of diecutting and pre-press.

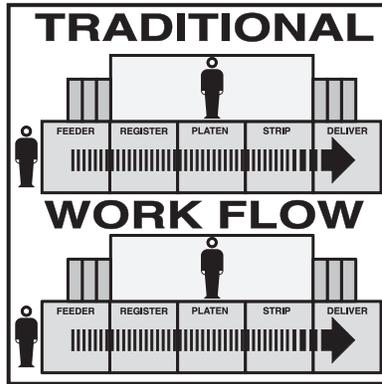
As all of the platforms and the work areas are at the same level, it is possible to observe both presses and the work in pre-press from any vantage point in the work cell. This results in having 3 or 2 personnel available for each press changeover, depending upon the flow of work.



This is a highly effective team environment, in which education, research, and skill development are inevitable outcomes. The three personnel share all of the responsibilities of maximizing productive output, however, one member plays the role of team leader, a role which should rotate between the three team members on a monthly basis.

Level Six

Level Six provides a similar work environment, however, instead of two presses, three presses are aligned around a central core of the pre-press discipline. This is generally a four person work team, however, many organizations implement this Modular Work Flow with only a three person team.



the knowledge gained by participating in press changeover, and in pre-press activities.

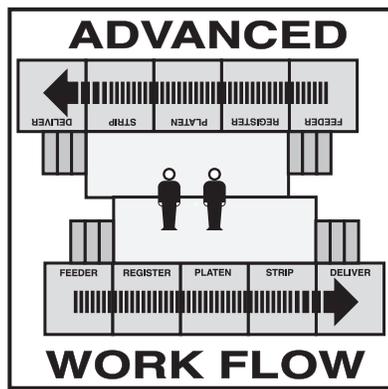
As this represents a more complex system of manufacturing, team leadership is usually fixed, however, two personnel are constantly trained to provide back-up and coverage for the team leader position. The long term goal is to teach the diemakers diecutting, and to teach the diecutters diemaking. The benefits gained by this

inevitable exchange of knowledge and skill is the ability of the entire team to build and sustain a high output work unit.

Level Eight

The final step in this progression is to create a layout similar to Level Seven, however, the major innovation in this system of working, is the introduction of a CAD-CAM Work Station, and the introduction of a CAD CAM Technician to the work team.

This system of working closes the knowledge loop in diecutting as the CAD-CAM technician and the diemakers are directly involved in the system of manufacturing they design and fabricate tools for. The rapid education of every member of this team leads to almost daily innovation in structural design, in layout, in tool-making, in press-changeover, in press production, and in converting quality.



As in Level Five the goal is that every team member becomes interchangeable, and this work environment lends itself to rapid education and to fast skill development. As in Just-In-Time Work Flow, the position of Team Leader can rotate

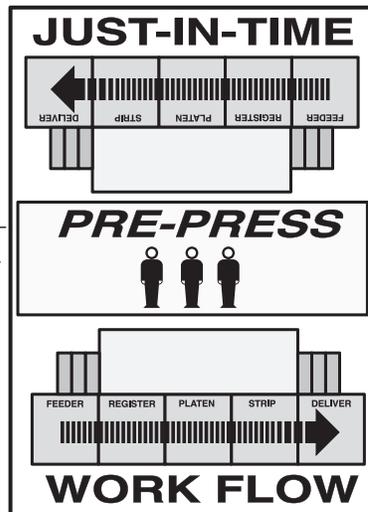
between team members, however, the timing of the rotation for this work system is usually every three months.

Most organizations begin this process with a four man or five man team, however, as the team gains competence and confidence, it is quickly apparent the additional team members are no longer essential to running this efficient system of diecutting manufacturing.

Level Seven

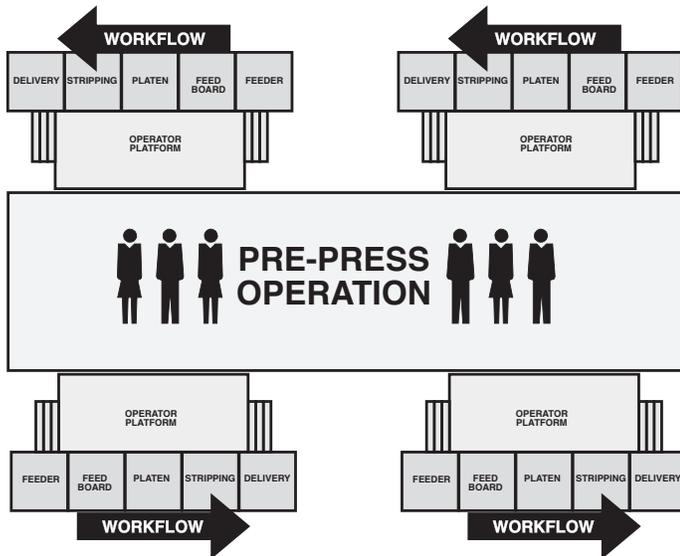
Level Seven is a progression from Level Five and Level Six, however, the major change in this work organization method is two diemakers and two diemaking workstations are integrated into the pre-press discipline. This generates a six person team.

The long term goal of this team is interchangeability between every team member, however, the primary benefit of the integration of the diemaking team is the improvement of the tooling as a result of



Team leadership is generally a fixed position in this system of working, however, the supervisory or team leader position is still one of active participation in every activity involved in the system of manufacturing. This is an excellent format for training for every position, however, it is an excellent system for converting the diemaking skills into Computer Tool Design Skills, and ultimately Structural Design ability. The primary goal is fast press changeover, and maximum productive output, however, the secondary benefits of daily training and skill development are

The ABC's of Fast Diecutting Press Changeover!



key benefits of this approach to diecutting manufacturing.

The great advantage of attacking the problem of fast press changeover, by working from one organization level to the next, is progress from One to Eight can be managed and controlled based upon the developing skill and experience of the work teams. In fact, the first stage, Level One, is simply an exercise in common sense.

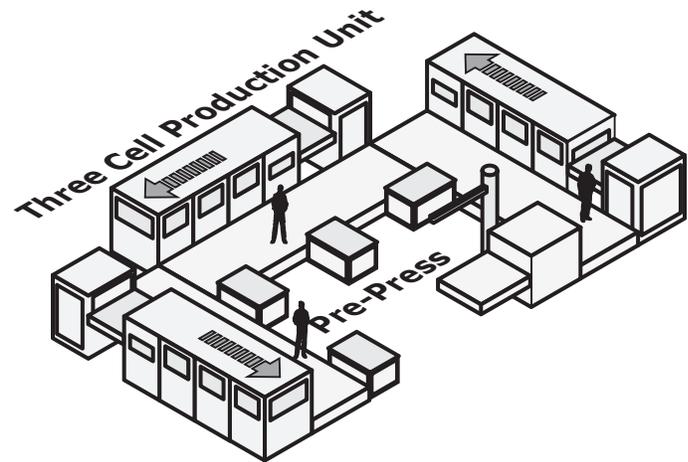
By stabilizing the current process, by standardizing and unifying existing procedures, and then by benchmarking and streamlining on-press activity, we are making the current system of changeover faster, better, and simpler, without making major changes in organization or in manning. Converting as many On-Press Activities to Off-Press Activities is a simple and a powerful exercise, and of course it is the basis for Single Minute Exchange of Die. (SMED).

By organizing on and off press activity around Just-In-Time Principles and Inventory Management practices, we are inevitably creating the highly efficient Hospital Emergency Room approach, to work cell organization. By focusing on eliminating non-value added time, by using time as the primary benchmarking tool, and by focusing upon standardization and simplification of practices and procedures, we will increase the speed and the productivity of current systems of manufacturing, while also lowering operating costs.

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

The primary innovation, which is essential to productive success in diecutting, is defined as Parallel Processing in SMED or the Single Minute Exchange of Die discipline. This simply means that using a team to complete several tasks simultaneously, rather than a single individual completing tasks one after another, or incrementally, reduces the time the press is out of production.

For example, if an operator is making the press ready, it is necessary to exchange the steel rule die, the patch-up sheet, and the female counter, then the male and

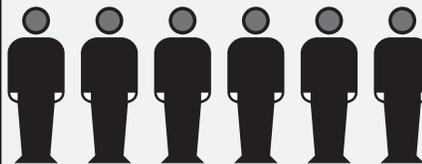


female stripping tools, including the bottom pin rack or the bottom pin tool, then the male and female blanking tools must be exchanged and the swords reset. If this takes a conservative ten minutes per tool set, the Activity Time for each tool set changeover is ten minutes, but the

Elapsed Time, or the time the press is not producing, is 30 minutes. However, when using a three man team these activities can proceed simultaneously, and although each Activity still consumes 10 minutes, the Elapsed Time or the time the press is not producing is now reduced to 10 minutes!

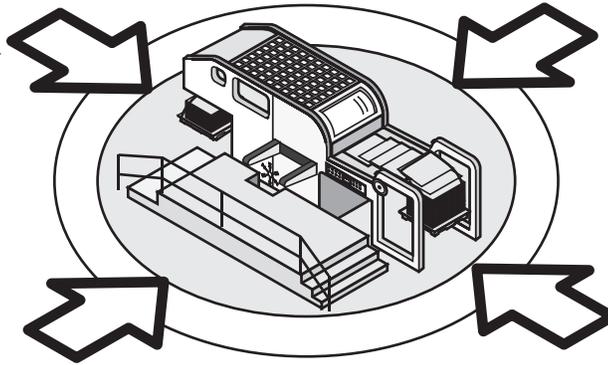
However, this is not just a numbers game, the benefits of using teams to change the press over from one job to the next can and does have profound impact on the ability of everyone in each work team. The benefits of using

TEAM PLAYERS



TOOL DESIGNER
DIEMAKER
PRE-PRESS
PRESS OPERATOR
UTILITY MEMBER
GUEST (SUPPLIER)

a Changeover Team to work together to complete each make-ready include:



the investment necessary to build a winning Changeover Team!

The Goals of Team Changeover:

“Organizations exist for only one purpose: to help people reach ends together that they could not achieve individually.”

~Robert H. Waterman

- ***Efficient Parallel or Simultaneous Processing.***
- ***Faster completion of key tasks.***
- ***Rapid knowledge, skill & experience sharing.***
- ***Greater Uniformity and Performance Parity.***
- ***A Reduction in the stress and the fatigue of a challenging activity.***
- ***More effective standardization, simplification and streamlining of key activities.***
- ***Faster Problem Solving and more effective innovation and progressive improvement.***
- ***A self regulating, disciplined, more focused work team.***
- ***Progressively faster, better, simpler, and lower cost press changeover.***
- ***Friendly competition between several changeover teams.***

The goals of team changeover, are obviously fast press changeover. However, the true goal of this reorganization of existing personnel is to create a unified team, with a focus on research, education, and training. In fact, productive diecutting success, will be more a factor of how well the teams are put together, and how effectively they work together.

The goal in any operation is to level the knowledge, the skill, and the experience playing field, and to continuously and evenly upgrade the competence of every person in the team. The goal is to get everyone to know what everyone already knows. And when new information, new ideas, new solutions, new techniques, and faster, better, and simpler ways of doing things are revealed each day, it is vital to have such a bullet proof system of information collection and distribution, that at the end of each week, every person has upgraded their knowledge and their benchmarked procedures in exactly the same way.

Fast press changeover is not the most difficult challenge we face, building a strong diecutting team, with seamlessly interchangeable team members is the most difficult challenge, and the true goal of this initiative.

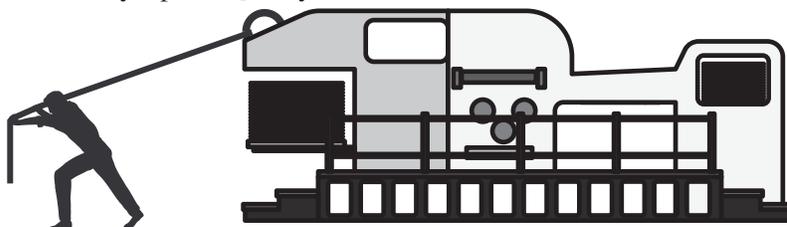
We have to convince the existing team of the importance of radical change; we have to create a mission for this initiative, which everyone in the team enthusiastically endorses; and we have to create a unity of purpose, which will drive the daily activity of everyone involved in achieving and sustaining fast team press changeover. The quotation at the beginning of this section; ***“Organizations exist for only one purpose: to help people reach ends together that they could not achieve individually;”*** is ex-

traordinarily apt for what we have to do. Teamwork and teambuilding are the keys to success and to job security in the Converting Industry.

These are obviously the benefits of effective teamwork in any activity, however, it would be naive to think these benefits will accrue from day one. The key to any effective team is Practice, Practice, and more Practice. If you are determined to be successful it is essential to invest in team building.

For example, this will bring the entire team in on a weekend to make-ready a typical job, then changeover to the next job, then changeover to the next job! With facilitators and team members monitoring and videotaping the activity, the practice day should end with a discussion of what happened, what worked, and what did not work! This is your Superbowl Team, and the last team to win the Superbowl invested a great deal of time in planning, in practice, and in an evaluation of what happened, and the Superbowl was not their first game together.

Remembering our Mission of Safety-Speed-Quality & Cost, if not for any other reason than the safety of the work team, extensive practice time is critical. And realistically, this is a key part of



The ABC's of Fast Diecutting Press Changeover!

Team Changeover: Methods & Practices

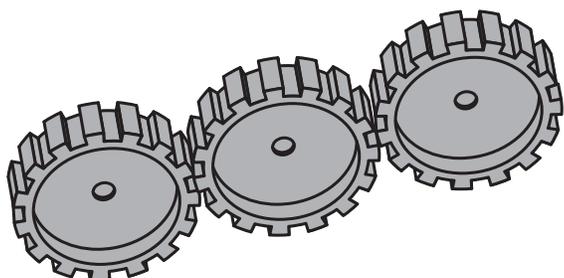
“The productivity of a work group seems to depend on how the group members see their own goals in relation to the goals of the organization.” ~Paul Hersey

It should be obvious that the implementation of **Level One** is a simple and an essential first step in moving toward a more effective and a more efficient method of fast press changeover. Although the implementation of Time and Just-In-Time Management; of Stabilization, Unification, and Standardization of set-up procedures; and of Inventory Management and Work Simplification, are challenging in the short term, they represent a minimal change to the existing system of manufacturing.

Press Make-Ready Action List		Individual Priority		
A	Press Set-Up			
B	Tooling Installation			
C	Information Management			
D	Product Inspection			
E	Tooling Adjustment			
F	Cleaning & Maintenance			
G	Loading Materials			
H	Trial Manufacturing			
I	Product Approval			
J	Tooling Deinstallation			

The heavy lifting begins when we progress through the levels, as each progressive method is built upon a foundation of team building and of teamwork. This is clearly a key element of Single Minute Exchange of Die, which is defined as Parallel Processing, or the simultaneous execution of set-up activities by members of a changeover team. Working toward the goal of operating in the same way as a NASCAR Pit Crew Changeover Team, while simple in concept, this logical development represents the largest change and the greatest challenge to the management team and to the current press operating team.

Effective teamwork obviously rapidly levels the knowledge, the skill, and the experience playing field. However, the transition from individual independence of

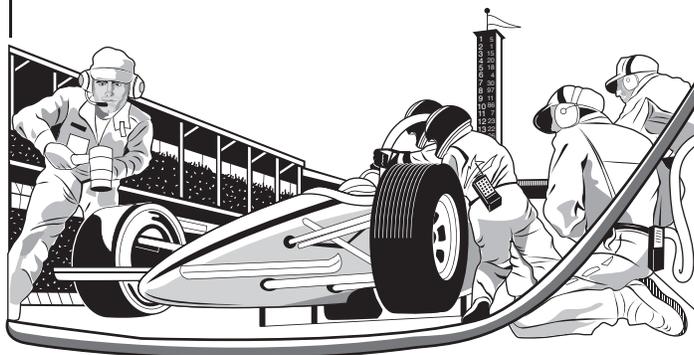


action and the apparent freedom of choice, to the perceived constraints of a standardized system of team changeover, where procedures and actions are pre-determined and pre-defined, is a large pill to swallow for many experienced crafts men and women.

The advantages and the benefits of this approach to manufacturing were clearly defined in Section Two, *“Building Effective Teams through Team-Work,”* but it is important not to underestimate the challenge the management team faces in starting and driving this transition. Therefore, we are repeating the recommendations provided in Section Two, page, 59-60, for the Methods & Practices of establishing an effective team...

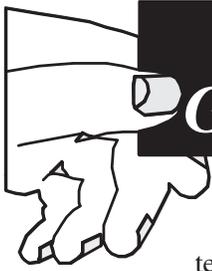
The key to effective teamwork and to the success of this project is to develop a consensus between all of the team members, to continuously combine their respective skills and knowledge, and to integrate their accumulated experience. Therefore, the system of working must ensure the foundation, the team and the relationship between team members, is strengthened and reinforced. The methods and practices, which would consolidate team viability would include:

- ➔ Providing education support to the teams in the form of an experienced team trainer, who could also play the role of an unbiased facilitator, mentor, or coach.
- ➔ Using the creation of documented and consensus



TEAM BUILDING ISSUES

- 01: The Team Charter**
(Why are we forming this team?)
- 02: The Team Values**
(How will we work together?)
- 03: The Team Mission**
(What are we trying to achieve?)
- 04: Team Measurement**
(How do we measure success?)
- 05: Team Management**
(How do we get things done?)
- 06: Team Procedures**
(How do we plan, execute, control & evaluate?)
- 07: Team Decision Making**
(How do select the most effective option(s)?)
- 08: Team Resources**
(How do we get the tools to do the job?)
- 09: Team Benefits**
(How will completion improve our status?)
- 10: Team Future**
(What happens when the project is complete?)



GET GOING!

driven videotaped standard operating procedures as the basis for building relationship and

technical unity of purpose.

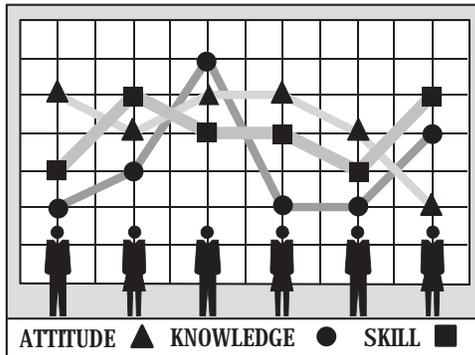
→ Regularly scheduling time for each team to discuss problems, issues, and to develop a plan for potential changes.

→ Implementing a regular team close out to ask:

- * What is working well?
- * What is less effective?
- * What and how do we need to change?

→ Providing training support to build and consolidate team and relationships skills, including:

- * Leadership Training
- * Resolving Disputes
- * Meeting Management
- * Planning & Organization

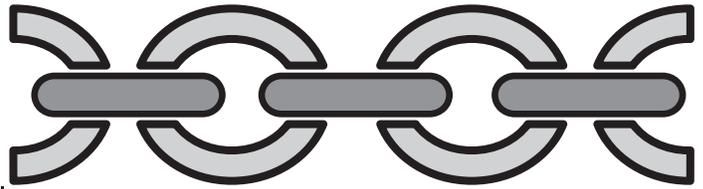


This is a project, which will impact and change every previously employed method and practice of working, therefore, it is important to add techniques and procedures to all activity which support and encourage team development and team work.

Team Changeover: The Benefits of Change

“As exceptional performance is the key to organizational success, a manager’s job is to establish the conditions under which superb performance serves both the company’s and the individuals best interests.” ~Lee Thayer

The quotation above by Lee Thayer explains the advantage of a team approach to manufacturing. Although the establishment of effective teams and teamwork is by



no means a simple task, the benefits of this approach to diecutting-converting are extraordinary. If we simply list some, but not all of the benefits, it is obvious why team changeover is so successful. The benefits would include:

- Faster and Faster Speed to Market
- Enhanced Responsiveness & Turnaround
- Greater Throughput & Faster Cycle Time
- A Significant Reduction in Operating Cost
- Higher Productivity & Profitability
- Higher Yield & Greater Consistency
- Rapid & Even Skill Development
- Measurable Daily Improvement
- A Faster, Simpler, & Better Process.

Diecutting Changeover and Diecutting Production are two perennial bottlenecks in any Converting-Manufacturing operation. The decision to restructure the system of manufacturing around teamwork and team building will ultimately lead to higher productivity, greater competitive security, and to greater profitability.

Given the volatility of the current market and the unpredictability of the future of the industry, it is essential to develop a World Class Organization, which uses teamwork to forge ahead of all competitors. Or perhaps it is they who are forging ahead of your organization?

Team Changeover: Recommended Actions

“Organizations are a system of cooperative activities--and their coordination requires something intangible and personal that is largely a matter of relationships.”

~Chester I. Bernard

The first step in taking action in this project is to invest in a team trainer and a team specialist who can facilitate and lead the team building project. It is more effective if



The ABC's of Fast Diecutting Press Changeover!

the person is not from your organization, and while some industry knowledge is a benefit, this person should not play any technical role in the project, but merely advise and coordinate team building and team activity.

Many of the steps and team building project actions have been specified, however, to reiterate the important sequence of activity, the recommended actions are:

- ➔ The project and the initiative should be presented to the entire workforce by the manager of the department, with the full support of the entire company management team.
- ➔ The organization should contract with an experienced team trainer and facilitator.
- ➔ A Planning Team should be selected including the facilitator, the department manager, one or two workers from the department, one representative from the internal supply department, one representative from the internal customer department, and any union representative appropriate to the diecutting-converting operation.
- ➔ The Planning Team should develop a provisional plan for the project and a vision statement to be presented to the work force.
- ➔ The manager, with the support of the owner/president, should present the plan to the entire workforce and solicit their assistance in finalizing the distributed provisional plan of action.
- ➔ A series of meetings should be scheduled between the workforce and the planning team to gather feedback, to answer questions, and to solicit suggestions to augment and improve the propose program of change.
- ➔ The Planning Team assimilates all of the feedback, suggestions and concerns, revises and re-distributes the updated plan of action.
- ➔ The initial teams are selected and training for the entire department is scheduled.
- ➔ A team name, nickname and a by-line is developed for each team, with a team logo.
- ➔ Team colors are selected and hats, t-shirts, jackets, and banners are provided bearing the team name, logo, and by-line.
- ➔ The Planning Team chooses simple and straightforward projects to give the new teams time to adapt to the new system of working and to gain experience in the new way of working.
- ➔ The creation of documented and consensus driven

videotaped standard operating procedures for these selected projects is employed as the basis for building relationship and technical unity of purpose.

- ➔ Implement a regular team close out to discuss problems and issues, asking:
 - * What is working well?
 - * What is less effective?
 - * What and how do we need to change?
- ➔ Evaluate team performance and adapt the plan and schedule further training accordingly.
 - * Leadership Training
 - * Resolving Disputes
 - * Meeting Management
 - * Planning & Organization
- ➔ Take any and every opportunity to reward and publicly recognize achievement with inexpensive gifts, trophies & certificates
- ➔ Celebrate any and all successes with Pizza, Cake & Cookies.

As you can see this from this recommended approach to creating an effective team driven system of converting manufacturing, the project should be implemented in a measured, steady, and unrelenting fashion. In principle, each step is simple and straightforward, however, the key challenge of this project is in integrating this project into and with the daily race against a relentless market driven production clock.

Therefore, it is important to plan with this in mind and to anticipate, to develop, and to communicate contingency actions to deal with inevitable delay and disruption.

“The whole object of the organization is to get co-operation, to get to each individual the benefit of all of the knowledge and all of the experience of all of the individuals.” ~ Hamilton Barksdale

Section Nineteen:

Team Changeover: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ The challenge we face is we are struggling with traditional methods and practices, which although they can be marginally improved, lack the flexibility to make and to sustain rapid and continuous daily improvement. As it has consistently proven difficult to transform the current system of manufacturing into an efficient, and a productive diecutting operation, it is obviously necessary to consider a different, and a more effective approach.
- ✓ The keys to the new discipline are based around an understanding and the implementation of **Time and Motion and Just-In-Time Principles**, and an adoption of a more effective organization structure for preparation and execution of press changeover. These include the discipline of organizing using the principles and practices implemented in a **Hospital Emergency Operating Room**, and by adopting the competitive team changeover principles and practices used in a **NASCAR or Auto Racing Pit Crew Changeover**.
- ✓ The current method of press make-ready is primarily an **Incremental Process** in which a series of predictable tasks are executed in a sequence, one after the other. This method of working is neither time efficient nor does it utilize available resources effectively. The alternative is the **Simultaneous Process**, in which a team of people, with pre-determined duties and responsibilities, execute a series of pre-determined activities, in a coordinated and a choreographed manner, designed to changeover in 30 minutes or less!
- ✓ The primary problem with the traditional diecutting operation set-up, is there is no universally accepted plan of productive action which represents the consensus of the entire team. And without teamwork, without consistently applied procedures, without daily benchmarking, without effective leadership, and without a unified vision of a more effective operating structure, diecutting organizations consistently struggle to improve.
- ✓ The potential solutions for press changeover, are suggested in a graduated progression, from basic, to intermediate, to advanced. Simply stated these suggestions for organizational change range from those requiring minimal effort and disruption, and being capable of fast implementation, to those which require planning, training, and practice, and will require a longer term to perfect the skills.
- ✓ It is important to note all of these methods of press changeover are based upon a thorough re-organization of the press, the tools, the materials, and the supplies, in a Just-In-Time one and off-press organization discipline. These principles and practices defined in earlier sections of the manual, describing Time Management, Just-In-Time Organization, Single Minute Exchange of Die, Inventory Management, Simplification and Pre-Press Organization, will make a significant productive impact on press changeover, if nothing else is changed. However, when you consider the breakdown of Non-Value Added Time as compared to Value-Added Time, contained in the diagram at the bottom of the next page, it is vital to customize the press and the work areas to make press changeover as simple as possible. Stabilize, Standardize, and Streamline.
- ✓ The great advantage of attacking the problem of fast press changeover, by working from one organization level to the next, is progress from **One to Eight**, can be managed and controlled based upon the developing skill and experience of the work teams. In fact, the first stage, Level One, is simply an exercise in common sense.
- ✓ The primary innovation, which is essential to productive success in diecutting, is defined as Parallel Processing in SMED or the Single Minute Exchange of Die discipline. This simply means that using a team to complete several tasks simultaneously, rather than a single individual completing tasks one after another, or incrementally, reduces the time the press is out of production.

Section Nineteen:

Team Changeover: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Can you name five of the Diecutting Ten Commandments?
- ✓ What are the Commercial Market Dynamics impacting the Diecutting Process?
- ✓ Why do you think Speed to Market is now such an important issue?
- ✓ Describe the benefits and the advantages of organizing press changeover around the principles used to organize a Hospital Emergency Room?
- ✓ Describe the benefits and the advantages of organizing press changeover around the NASCAR Pit Crew approach to high speed race car servicing?
- ✓ What are the disadvantages of using Incremental Processing to complete Press Changeover?
- ✓ What are the advantages of using Simultaneous Processing to complete Press Changeover?
- ✓ Why do you think previous Fast Press Changeover Projects have failed?
- ✓ Why is the practice of allowing every individual to complete Press Changeover using an inconsistent and a random execution of procedures, such a disadvantage?
- ✓ What is the difference between Total Press Time, Actual Press Time, Real Press Time, and Net Press Time?
- ✓ What is the importance of Value-Added Time and

Non-Value Added Time in Press Changeover?

- ✓ How is Level One Organization of Press Changeover organized and implemented?
- ✓ How is Level Two Organization of Press Changeover organized and implemented?
- ✓ How is Level Three Organization of Press Changeover organized and implemented?
- ✓ How is Level Four Organization of Press Changeover organized and implemented?
- ✓ How is Level Five Organization of Press Changeover organized and implemented?
- ✓ How is Level Six Organization of Press Changeover organized and implemented?
- ✓ How is Level Seven Organization of Press Changeover organized and implemented?
- ✓ How is Level Eight Organization of Press Changeover organized and implemented?
- ✓ Which Level of Press Changeover Organization do you think your company will choose and why?
- ✓ How difficult do you think it will be to introduce the SMED practice of Parallel Processing into the current system of diecutting manufacturing?
- ✓ How would you rate the current diecutting department in terms of teamwork, cooperative work planning, and productive support?
- ✓ List five advantages of a team based approach to press changeover?
- ✓ Name five benefits of adopting a team approach to press changeover?
- ✓ Describe four of the key actions or recommendations in organizing a team approach to diecutting press changeover?

Manufacturing System of Organization

Section 20: Diecutting Quality Management

Key Definitions: ... the degree of excellence of something as measured against other similar things ... how good or bad something is ... the process of looking at goods when they are being produced to make certain that all the goods are of the intended standard ... distinguishing property, characteristic, or attribute ... a degree or grade of excellence or worth ...

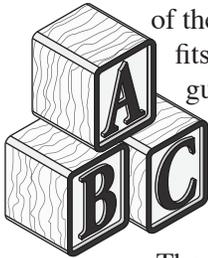
The Quality Management Mission Statement: "It is the combined mission of the Structural Design, Diemaking, Pre-Press, and Diecutting teams to specify, design and fabricate tools with optimal converting parameters, and to install, synchronize and prepare them in the diecutting press, to generate diecut products, which meet or exceed customer requirements."

Diecutting Quality Management:

An Overview

"(Manufacturing) ... excellence results from dedication to daily progress. Making something a little better every day." ~Robert Hall

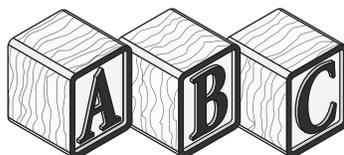
It is obviously critical to attack any problem directly, rather than dealing with the symptoms of the problem because of a failure to fully understand the true source of the problem. Diecutting Quality Control fits into this category because we are often guilty of dealing with failures, mistakes and short term issues, which are in fact only symptoms of a more fundamental long term problem.



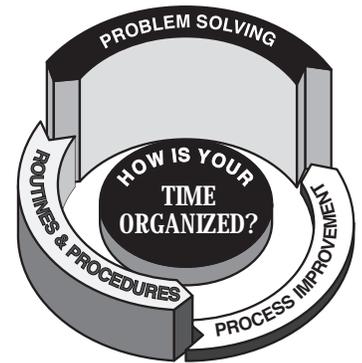
The discipline of Quality Management & Quality Control in Diecutting is designed to detect flaws, errors, and variance in the diecut product, at the earliest stage possible. However, this activity exposes a weakness in the techniques, the methods, and the procedures used to set-up the converting activity in which the incident occurred. When a quality failure happens, the diecutting team conducts a short or a long term research initiative to develop a more effective technical alternative.

Once the new procedure or practice has been approved it must be taught to every member of the diecutting work team, to close the breakdown in the system of manufacturing. This reworking of basic procedures or activities requires training and coaching to educate the work team in the new procedure. And this cycle of closing the error loop is continuous as we seek to build a more bullet proof method of productive diecutting.

Therefore, if we examine this activity from a cause and effect analysis, Quality Control and Quality



Management are fundamentally about Research, Education, Training & Skill Development. Certainly this cycle of activity is about problem detection, cause analysis, research, testing, and then re-working and recertifying basic procedures. But the Bottom Line is Quality Control is primarily an Education Discipline!

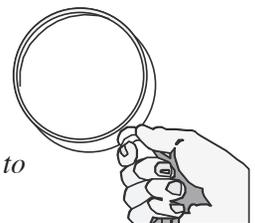


The Quality Control discipline is designed to expose weaknesses and gaps in the skill, the knowledge, and the competence of the work teams in a positive and a productive manner.

Therefore, **Quality Management is Knowledge Management, and Quality Control is Skill Control.**

In reality converting errors and mistakes are caused by:

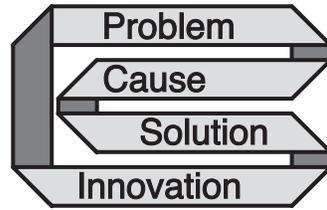
- ➔ Poor analysis & evaluation of the diecut product, the diecut product application, the diecut material, and the diecutting application.
- ➔ Poor Tool Analysis, Specification & Design.
- ➔ An incorrect selection of key converting tool parameters.
- ➔ Poor tool machining and inconsistent fabrication.
- ➔ Inaccurate tool-to-tool registration and imprecise tool-set-to-tool-set synchronization.
- ➔ Ineffective and inconsistent press-set-up techniques.
- ➔ An inability to correctly assess and interpret converting results during and subsequent to press make-ready.



The ABC's of Fast Diecutting Press Changeover!

- A lack of understanding and an ineffectual relationship between the internal Customer Supplier disciplines in the total manufacturing process.
- An incomplete understanding of the role the diecut product plays in the end-user customer process.

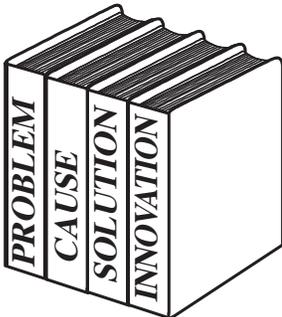
All of these issues, and the majority of errors, failure, and mistakes are caused by an incomplete education, by inconsistent training, by significant variation in skill development, and by uneven competence between all of the team members involved in diecutting converting. Therefore, to reiterate an earlier statement; **Diecutting Quality Management and Control is an Education and a Training Discipline.**



Diecutting Quality Management: Problems & Solutions

"Quality is everyone's responsibility." ~ Dr. W. Edwards Deming

In practice, Converting Manufacturing is primarily a research discipline. We are continuously searching for answers to new problems, to new situations, to new challenges, and we are responding daily to product innovation as we stretch and push our technical prowess. Research is a search for gaps or holes in existing knowledge and experience. These gaps can often be improperly identified as mistakes, errors or defects, when they are primarily an opportunity to discover better or faster ways to do things.

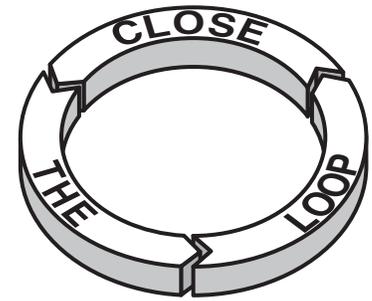


It is not necessarily a good practice to celebrate errors, however, their value in exposing a weakness in our current system of manufacturing is immense. How do we get better? We try something new or we attempt to solve a technical problem using a different approach. Sometimes we are successful and sometimes we fail. But each success and each failure teaches us something new about the discipline of converting. And it is often true that the most valuable information we have is to know what does not work!

Inevitably, the majority of these



failures, mistakes or knowledge gaps are discovered by individuals. If however, we are not organized around a team structure, and we are not focused on the positive impact of discovering gaps in our knowledge base, many of these opportunities to share knowledge are lost. Which means we are continuously reinventing the same wheel as different members of the team run into the same problem, and we experience a failure in quality or a loss of productive output. If we recognized the extraordinary opportunity presented by each failure, we would pursue them with rabid enthusiasm, and make sure there is no stigma attached to discovering a unique problem in our understanding of the diecutting-converting process.

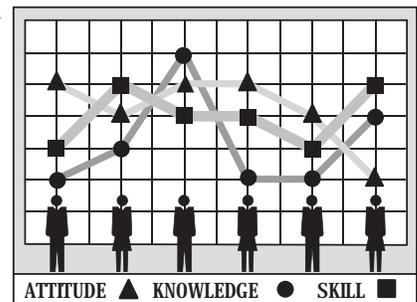


The mechanism designed for capturing these errors or knowledge gaps is the discipline we call Quality Control or Quality Management. Quality Management is designed to seek out and to identify errors, mistakes and failures, and to quantify each breakdown in a way which will lead to remedial activity. In practice, Quality Control is a discipline designed to discover what we do not collectively know about the diecutting-converting process.

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

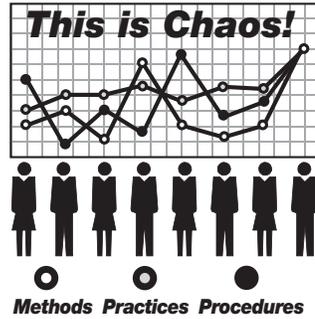
The danger in our current approach to problem solving, and danger is the most accurate word to use, is we do not really see problems as opportunities. And while this may be a cliché, it is none the less, a fundamental truth. Experience is simply the ability to anticipate and prevent potential problems, and/or the ability to react swiftly to a problem, by applying a logical mix of similar techniques, which have worked on similar problems. In this normal part of manufacturing-converting, failure is as valuable as success. Because both add to our body of knowledge and to our accumulated experience and competence.

Our myopia about this issue is further compounded because

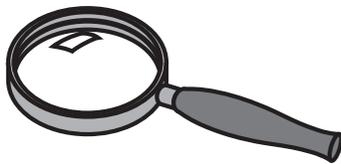


we do not enjoy a level playing field, where knowledge, experience and problem/solutions are shared and discussed. There is rarely any systematic approach to problem management, nor is their training in problem solving techniques and proven procedures. For example, we do not capture, categorize, document and distribute problems and solutions to the entire work team. Inevitably, converting manufacturing is complex, it is confusing, and it is excessively costly.

There is no database of known problems and solutions, no description of unsolved problems to avoid or to attack, and no method of sharing this information with the entire team. Naturally, in this system of avoidance, there is minimal opportunity for team members to learn from the mistakes of others, and/or to share their personal experience. The established behavior is to struggle and to avoid asking for assistance, as though encountering a problem, and needing guidance or help, is a stigma or a sign of weakness!



In practice, problem solving is the most important standard operating procedure in every discipline throughout the converting process. And in reality, problem management is one of the most important



building blocks of an effective diecutting team. In any form of manufacturing, the most expeditious method of dealing with a problem is to focus as much knowledge and experience on the problem as soon as possible. The more eyes, the more brainpower, and the more experience brought to bear, usually generates an effective solution in the shortest time. In addition, the shared experience of problem solving gets everyone involved, so that everyone learns from each other, and at the same time!

Problem solving in converting is like the invisible King's Clothes in the famous parable. In converting, everyone pretends they do not exist, as though there is something to be ashamed off in not having the answer for every potential problem. This strange behavior is damaging to the entire team as the problems and the solutions are driven underground and ignored. It is vital to create an environment, in which every participant experiences no disadvantage or loss or prestige by stating;

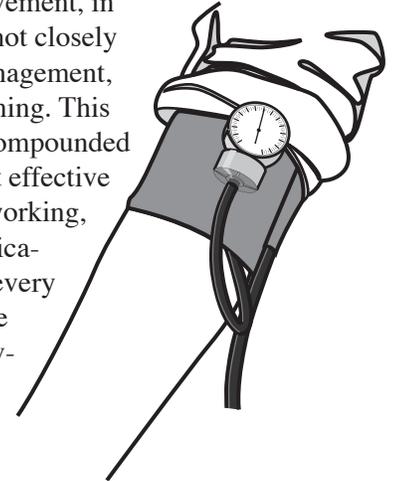


"I don't know!"

Quality failure is impossible to ignore, and in most organizations it is a mirror image of the collective, and focused knowledge and experience of the entire organization. Therefore, our failure to link Quality Control, Problem Solving, and Training and Skill Development, is a significant disadvantage in developing and sustaining a professional and a productive diecutting organization.

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

There are a number of related causes for this common problem. The primary cause is most diecutting organizations represent a fractured, disconnected and ineffective system of process improvement, in which error detection is not closely tied to technical data management, to training, and to re-training. This discontinuity is further compounded by a failure to implement effective member-to-member networking, and team based communication, designed to ensure every participant has immediate access to all of the discoveries of all of the other team members.



The final straw in this unstable organization is the lack of procedural standardization. This means that everyone is doing things differently, making it complex to successfully match solutions to the random execution of continually variable techniques and methods. Few organizations implement a weekly list of technical issues and problems detected, nor is the team given the opportunity to get together and brainstorm solutions.

In reality the cause and effect of this disorganization, is the failure to build a viable link between the activities of the Quality Management Team and the activities of the Diecutting Team. Quality issues, failures and problems are in fact a highly sensitive signalling or early warning system, shining a spotlight on a breakdown in knowledge and skill, focusing attention on poorly or inconsistently executed procedures, or the discovery of a unique problem/opportunity which requires further research to solve

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the problem.

It is interesting to note in the Chinese alphabet symbols for many words have double meanings. Chaos is represented by a symbol, which combines danger and opportunity! "Chaos often breeds life, when order breeds habit." Henry Brooks Adams

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Unfortunately, when it comes to identifying, to collecting, to documenting, to team focused remedial activity, and to eliminating problems, by continually upgrading knowledge and procedures, most diecutting organization are in a state of disarray!

In the majority of companies, many of the daily problems have been solved, however, not everyone involved in the diecutting team is aware of the symptoms, nor are they aware of the remedial activity designed to eliminate the failure.

Quality Control and Quality Management represent an effective detection and signaling system, which once the problem has been addressed, should translate into a collective focus on problems, brainstorming, research, and solutions.



SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

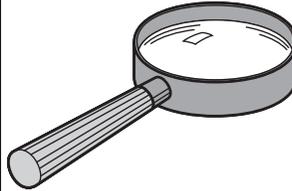
There are many types of failure, and many problems never result in a process or a diecut quality problem. The instinct of every person involved in manufacturing is to attack problems, to solve them as quickly as possible, and get on with the next task! There is little time for capturing and documenting problems, and naturally, many weaknesses and potential issues remain embedded in the diecutting system of manufacturing, waiting for an inopportune moment to strike.

To eliminate potential problems, to strengthen the system



of manufacturing, to improve the skill of every individual and every team, it is essential to develop a systematic approach to problem management and to process improvement.

The First Step is to remove the stigma associated with admitting to and reporting problems in diecutting. Although not a recommendation to celebrate each incident, it is important to recognize each issue as a means to permanently eradicate a recurrence of the problem, and to improve the speed and the efficiency of diecutting manufacturing.



The Second Step requires teaching and qualifying everyone involved in all of the teams, a standard and uniformly applied system of problem solving, and the disciplines associated with this activity.

The Third Step requires establishing a Fast-Close-Out on every key phase of diecutting manufacturing; CAD-CAM Design, Toolmaking, Pre-Press, Changeover, and Production to ask three simple questions:

1: What worked well?

2: What worked badly?

3: What do we need to change?

RESEARCH & DEVELOPMENT

Every day, in every design, in every problem, through every job cycle, there is new data and new knowledge generated, which can be collected and applied, to make every subsequent task simpler, more efficient, and less costly.

The term fast-close-out means that this should not be turned into a full blown meeting, but simply a discussion between each member and the team leader, with the team leader collecting each idea. The most effective question to ask, immediately at the conclusion of the activity, is; **"Tell me one thing we can do to improve, next time?"**

There is a temptation, to make it more complex, however, the power of this **consistently** applied approach is astounding. Just imagine if you had collected one idea from every key individual at the end of every key activity over the past year?

The Fourth Step requires setting up a brief, weekly meeting for each production team to quickly review problems and solutions which occurred during the previous week. At this stage there should be limited discussion about the issues regarding the problem, as the team should concentrate on a accurate record of the problem.

The Fifth Step requires setting up a Monthly team meeting in which the problems are prioritized in terms of their impact on diecutting, and then a more detailed discussion is conducted into each problem and into each solution. Naturally, as this is a critically importance discipline, if more time is needed it should be scheduled accordingly.



The Sixth Step requires creating a Master Problem-Cause-Solution-Innovation Manual, which will become a universal reference tool, it will become a communication tool, and it will become a training tool. The responsibility for creating and maintaining this Reference Work should be the responsibility of the Quality Control/Training Team.

The responsibility for creating and maintaining this Reference Work should be the responsibility of the Quality Control/Training Team.

The Seventh Step requires, the creation of a Problem-Cause-Solution-Innovation Data Base, which is accessible through computer screens/terminals strategically positioned throughout the manufacturing operation.

The Eighth Step requires integrating Quality Management & Personnel Training. The key reason for this change, is the Quality Team is involved in every aspect of manufacturing, from the original design of the carton, all the way through to cartoning, and in meeting customer needs.

Company Training Program	
The Function of each Department	
• Sales	• Estimating
• Customer Service	• Scheduling
• Structural Design	• CAD-CIM
• Graphic Design	• Plate Making
• Printing	• Diemaking
• Pre-Press	• Diecutting



The key problem with standard technical training, if it exists in an organized fashion at all, is it is far

Problem Solving	
1	Define the symptoms of the problem
2	Analyze the problem, identify all relevant factors, and get the facts!
3	Clearly state the problem to define and limit the problem solving process
4	Establish criteria and benchmarks for potential solutions
5	Brainstorm all possible alternatives, ideas, and suggestions
6	Weigh, evaluate, and select the most pragmatic solution
7	Plan the implementation, monitoring, and measurement of the solution

too narrow, and does not encompass the entire manufacturing process. For example, diemakers are unaware of the difficult of press make-ready, and the press operator has minimal knowledge of making a die, and neither has an adequate appreciation of the key characteristics of paper-board!

Compounding this problem, neither understand the entire converting process, nor do they have an effective grasp of the customer application, and often, they have an incomplete appreciation of the packaging application.

By integrating **Quality Management, Problem Solving, & Technical Training**, we immediately have an effective and a pragmatic system of education which is based upon the real, day-to-day challenges of converting diecutting.

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

The goal of this education initiative is to get everyone to know what everyone knows, however, the benefit will be lost if immediately after the problem solving session everyone goes back to using their same old, endlessly varied methods and practices. Not only is this the perfect



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time to go beyond problem solving to process innovation, it is also the perfect time to devise and to define a standard operating procedure for the task or action the problem was embedded in. We have just determined the best way to do something, so why would we go back to the random, ineffective techniques we previously employed?

This is where the Quality Control Team, as the primary observers of the diecutting process, can make an important contribution. We have all experienced the surge of confidence on the day of a training session, only to gradually lose confidence as a majority of the team gradually fall back to their old ways.

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Training is Behavior Development and Behavior Modification, therefore the Quality Team can act as a Coach by guiding the participants, and to help them from falling back into old habits and practices, which have been shown to be ineffective.

The role of a coach would certainly require training, and change the relationship between the Quality Management Team and the Diecutting Team, however, the change is both logical and important to consolidate improvement, and to prevent repetition of mistakes, errors and backsliding! It is important to note the coaching guidance is not for the entire process, but just for the newly established standard operating procedure. Naturally, step-by-step, through the problem detection, solution, and development or reworking of an established standard videotaped operating procedure, the entire diecutting process will be standardized and benchmarked, and every individual will be trained and coached to success.

This is a radical change to the current operating structure, but to match the needs of the market and the industry, and to remain competitive in a global economy, it is essential to replace a system of manufacturing, which has proven ineffectual, with a system of manufacturing, which builds teamwork, competence and confidence.



The Goals of Diecutting Quality Management:

"I am easily satisfied with the best." ~Winston Churchill

Every manufacturing operation is constantly focused upon eliminating production weaknesses by pushing the boundaries of applied knowledge, value and performance. Primarily this means detecting, researching, testing, and eliminating problems and unplanned variables, and by developing effective solutions. In this environment, the Quality Management Team is uniquely positioned to be a catalyst for progressive change.

The goals of the Quality Management discipline include:

- ➔ To stabilize & strengthen the Diecutting Converting Process.
- ➔ To improve product quality and consistency.
- ➔ To meet and/or exceed customer expectations.



- ➔ To increase the speed of processing.
- ➔ To minimize resource waste and cost.
- ➔ To systematically eliminate problems, and to meticulously share solutions with the entire work team.
- ➔ To develop knowledge, skill, and performance parity.

- ➔ To anticipate and/or to eliminate unplanned variables and deviation from the customer/job specification.
- ➔ To create and augment a technical data base of optimal tooling parameters and press settings.
- ➔ To document the changing process.
- ➔ To develop a systematic approach to pre-production preparation to detect and to prevent failure.
- ➔ To ensure the performance of every key variable, parameter, and material is pre-determined, and/or pre-tested.
- ➔ To stabilize, to standardize, and to benchmark the best of the best.
- ➔ To support, energize, and to coach the diecutting team to success.

This initiative represents one of the most important opportunities in diecutting converting. Because by focusing all of the talent, all of the knowledge, and all of the experience of all of the team members, daily productive improvement will become a pragmatic reality.

Diecutting Quality Management:

Methods & Practices

"The quality of a person's life is in direct proportion to their commitment to excellence, regardless of their chosen field of endeavor." ~Vince Lombardi

We need to analyze problems based on 5 elements:

- 1) Object "What"
- 2) Agent "Who"
- 3) Method "How"
- 4) Space "Where"
- 5) Time "When"

We must not forget to observe both process and operation.

Shigeo Shingo

It is generally assumed that the primary goal of Quality Management is the detection of errors or deviation from a standard or from the specification of the product, approved by the customer. While this is true, it is also important to focus on the **What, Who, How,**

Where & When, defined by **Shigeo Shingo in the SMED**

Four goals of improvement:

- 1) *make things easier*
- 2) *better*
- 3) *faster and,*
- 4) *cheaper.*

To achieve this we must

- 1) *focus on goals*
- 2) *recognize multiple goals*
- 3) *pursue goals systematically gradually toward the higher level of underlying goals.*

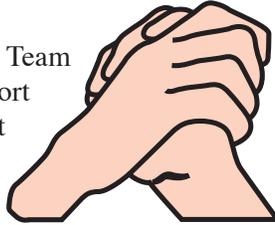
Shigeo Shingo

discipline. Clearly, Quality Control & Management are a cornerstone of an ongoing **Process Improvement Discipline**, with the goals of **Easier, Faster, Better, & Cheaper**.

For example, there are hundreds of details and steps, which are taken in several interdependent

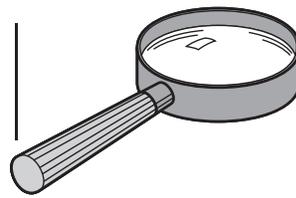
converting disciplines, which must be executed at the right time, in the right sequence and in the correct manner, to achieve success. The driving force of manufacturing is to attack an error, make corrections as fast as possible, and then to get back into production with the minimal of lost productive time. This is hardly conducive to a measured, logical, and careful examination of the problem and the cause of the problem.

However, the Quality Management Team should be directed to provide this sort of diagnostic and analytical support to the production team. Their job is to detect a problem, to assist the diecutting team in finding an effective solution, and in recording and documenting the solution. The precise definition, measurement and quantification of the problem, will prove to be an asset to the manufacturing team in their subsequent analysis and upgrading of methods and procedures.



To play an effective role, the Quality Management Team must have a working knowledge of each facet of the converting manufacturing process. For example they should understand:

- ➔ *The Diecut Product, End User Application Requirements.*
- ➔ *The Customer Packaging & Cartoning Requirements.*
- ➔ *The Gluing, Finishing, & Packing Process.*
- ➔ *The Diecutting & Stripping Process.*
- ➔ *The Diemaking/Toolmaking Process.*
- ➔ *The CAD-CAM/Structural Design Process.*
- ➔ *The Printing & Graphics Process.*
- ➔ *The Critical Parameters of the Converting Process.*



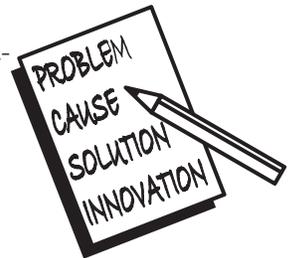
This does not require expertise in each of these disciplines, however, this would certainly be an advantage in problem solving and in trouble shooting.

To play an effective support role in the organization it is also important they have an understanding of:

- ➔ *The Problem Solving Discipline.*
- ➔ *Teamwork & Team Training.*
- ➔ *Teaching Quality Control.*
- ➔ *The Customer-Supplier Relationships in Converting.*

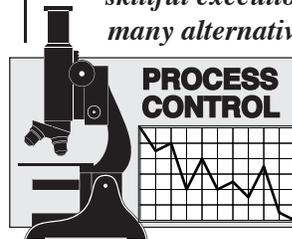
The Quality Control Team should play an important interactive role, in which they become an integral part of the diecutting/converting team. It is often poorly defined, but it is vital, the Quality Team and the Converting Team develop a positive and a cooperative relationship, rather than the antagonistic relationship, most would deem normal.

By working together in a cooperative and respectful relationship, both teams can develop methods and practices, which will elevate the organization to World Class Manufacturing Status.



Diecutting Quality Management: The Benefits of Change

“Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skillful execution; it represents the wise choice of many alternatives.” ~William A. Foster



The Quality management Team is in a unique position to play both a leadership role and to act as a catalyst in building a vibrant team consensus. Their participation

will ensure a more logical and a more practical integration of quality control, problem solving, effective training and process improvement.

Their ability to be directly involved, combined with the luxury of standing back to calmly assess, to analyze, and to accurately diagnose, is an invaluable asset. Their directive, to seek out and to flow toward quality issues, gives the Quality Team a unique ability to act as a recorder and

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as a facilitator. In practice, as the Quality Team gains experience, they will play the role of coach to support training initiatives, and the consolidation of behavior development and behavior modification.



educate the work team in the new procedure. And this cycle of closing the error loop is continuous as we seek to build a more bullet proof method of productive diecutting.

Inevitably, the trouble shooting support role results in more accurate and consistent problem documentation and the development of a streamlined, standardized system of diecutting manufacturing. They will also ensure greater awareness of the real challenges of converting, and enable the key issues of diecutting to receive the remedial focus, which is often overlooked.



"The (quality control) issue has more to do with people and motivation and less to do with capital and equipment that one would think. It involves a cultural change."

Michael Beer

Clearly, this is a very different role from the hands-off relationship of the majority of Quality Control functions, however, the integration of the Quality Team and the Diecutting Team, in a

consultative and a cooperative focus on the **Problem-Cause-Solution-Innovation** discipline and in making tasks simpler, faster, and better, will improve the confidence and the productive potential of everyone involved.

Diecutting Quality Management: Recommended Actions

"Where quality is the thing sought after, the thing of supreme quality is cheap, whatever the price one has to pay for it." ~William James

At the beginning of this chapter we stated : The discipline of Quality Management & Quality Control in Diecutting is designed to detect flaws, errors, and variance in the diecut product, at the earliest stage possible. However, this activity exposes a weakness in the techniques, the methods, and the procedures used to set-up the converting activity. When a quality failure happens the diecutting team conducts a short or a long term research initiative to develop a more effective technical alternative.

Once the new procedure or practice has been approved, it must be taught to every member of the diecutting work team, to close the breakdown in the system of manufacturing. This reworking of basic procedures or activities requires training and coaching to



Therefore, if we examine this activity from a cause and effect analysis, Quality Control and Quality Management are fundamentally about Research, Education, Training & Skill Development. Certainly this cycle of activity is about problem detection, cause analysis, research, testing, and then re-working and recertifying basic procedures. But the Bottom Line is Quality Control is primarily an Education Discipline!

This leads to the question: How do we begin to integrate Quality Management & Control, Problem Solving, Technical Training & Process Improvement? There are multiple recommended actions we must consider in this far reaching process improvement project. These are as follows:

Men acquire a particular quality by constantly acting in a particular way.



→ It is critically important to begin this project by making sure there are no remaining stigma or embarrassment in detecting and/or in admitting an inability to solve a specific problem. The identification of problems or even perceived problems in the system of manufacturing, should be seen as a positive opportunity for the entire organization.

→ It is also critically important to correctly define what a problem is. This definition should include anything which compromises the safety of anyone involved in the operation; any issue which degrades or inhibits the speed of processing; anything which undermines or reduces the quality and the consistency of the diecut part; and/or anything which adds non-value-added time, unnecessary complexity, or increases cost in the system of manufacturing. Examples could include:

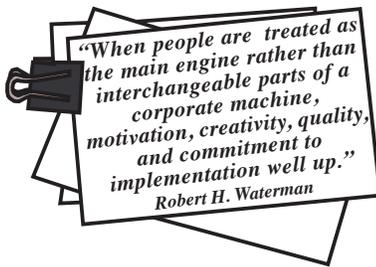
- Work-In-Progress in the wrong location.
- Missing tools components or materials.
- Tool damage or variation for the specification.
- Waiting for anything.
- Incorrect information or data, etc.

→ With the key players in both CAD-CAM, Toolmaking, Diecutting & Quality; brainstorm, redefine, & develop a plan of action to augment the role of Quality Management & Quality Con-



trol in the system of diecutting.

- Develop and implement a system of technical training for the Quality Team in CAD, in Toolmaking, and in Diecutting.
- Develop and implement a system of technical training for the CAD, the Toolmaking, and the Diecutting Team in Quality Management & Control.
- Form a Problem-Cause-Solution-Innovation PCSI Team consisting of key players from CAD-CAM, Toolmaking, Diecutting & Quality Management.
- Develop an approved system of problem solving and trouble shooting, and teach everyone involved



in manufacturing, the standard operating procedure for problem solving.

→ Develop a Standard Operating Procedure for the documentation of Problems & Solutions.

- Conduct a detailed census with individuals and teams, to identify, to define, to list, and to prioritize all known problems, whether they are currently solved or unsolved.
- Circulate the list of Problems & Solutions, and ask for feedback, and encourage the team to prepare for a number of subsequent meetings to discuss the issues.
- Hold a series of meetings with small groups, with key players, and with individuals to seek clarification and an accurate description of each problem, to see if a solution already exists, and to brainstorm, and to collect ideas and suggestions for a solution to each problem.
- Document each prioritized problem in a sequence giving everyone time to get involved. Where necessary the documentation may include videotape and digital images.
- Use the completed problem as a Standard Operating Procedure, designed to act as a training guide, and schedule all the key people to be trained in the new "solution" procedure.
- To simplify this entire procedure



A Quality Organization



consider the use of videotape with a voice over by one of the team trainers.

- Maintain up-to-date, PCSI Manuals, at key locations, throughout the diecutting converting operation.
- Gradually convert the PCSI Manuals into a distributed computer data based, accessible through an Intranet, positioned in strategic locations throughout the converting operation.
- Develop a protocol for adding new problems, and/or for making suggestions to modify existing solutions, or to elevate solutions into innovation.
- Integrate a simple Close-Out to collect problems and solutions. Asking basic questions such as:
 - What worked well?

- What worked badly?
- What can we change next time to eliminate the problem?
- Implement a brief weekly meeting to collect Problems-Cause-Solution-Innovation.
- Implement a more detailed process postmortem for those jobs, which experienced more serious issues and contain a number of interlocking problems.



→ Implement a monthly, more detailed meeting, in which the PCSI issues for the month are discussed, and brainstormed to seek solutions.

- Build partnerships with other departments and other department personnel in the internal Customer-Supplier Chain, and seek their advice and their involvement in problem solving and trouble shooting.

This innovative use of Quality Management & Quality Control is both logical and effective, however, it does represent a significant change to the current system of diecutting-converting-manufacturing. It is an advantage to plan this change and to execute this change in a measured fashion, to allow everyone involved to gain confidence and comfort in this radical upgrade to an outdated process.

Section Twenty:

Diecutting Quality Management: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ It is obviously critical to attack any problem directly rather than dealing with the symptoms of the problem, because of a failure to fully understand the true source of the problem. Diecutting Quality Control fits into this category because we are often guilty of dealing with failures, mistakes and short term issues, which are in fact only symptoms of a more fundamental long term problem.
- ✓ The majority of errors, failure, and mistakes are caused by an incomplete education, by inconsistent training, by significant variation in skill development, and by uneven competence between all of the team members involved in diecutting converting.
- ✓ As we continuously search for answers to new problems, to new situations, to new challenges, and respond to product innovation, we stretch and push our technical prowess. Research is a search for gaps or holes in existing knowledge and experience. These gaps can often be improperly identified as mistakes, errors or defects, when they are primarily an opportunity to discover better or faster ways to do things.
- ✓ Diecutting-Converting is primarily about Research, Education, Training & Skill Development, but the Bottom Line is Quality Control is primarily an Education Discipline!
- ✓ The mechanism designed for capturing these errors or knowledge gaps is the discipline we call Quality Control or Quality Management. In practice, Quality Control is, a discipline designed to discover what we do not collectively know about the diecutting-converting process.
- ✓ Experience is simply the ability to anticipate and prevent potential problems, and/or the ability to react swiftly to a problem, by applying a logical mix of similar techniques, which have worked on similar problems. In this normal part of manufacturing-converting, failure is as valuable as success. Because both add to our body of knowledge and to our accumulated experience and competence.
- ✓ Quality failure is impossible to ignore, and in most organizations it is a mirror image of the collective, and focused knowledge and experience of the entire organization. Therefore, our failure to link Quality Control, Problem Solving, and Training and Skill Development, is a significant disadvantage in developing and sustaining a professional and a productive diecutting organization.
- ✓ The primary cause of poor problem solving in most diecutting organizations is it represents a fractured, disconnected and ineffective system of process improvement, in which error detection is not closely tied to technical data management, to training, and to re-training. This discontinuity is further compounded by a failure to implement effective member-to-member networking, and team based communication, designed to ensure every participant has immediate access to all of the discoveries, of all of the other team members.
- ✓ The instinct of every person involved in manufacturing is to attack problems, to solve them as quickly as possible, and get on with the next task! There is little time for capturing and documenting problems, and naturally, many weaknesses and potential issues remain embedded in the diecutting system of manufacturing, waiting for an inopportune moment to strike.
- ✓ Quality Control and Quality Management represent an effective detection and signaling system, which once the problem has been addressed, should translate into a collective focus on problems, brainstorming, research, and solutions.
- ✓ By integrating **Quality Management, Problem Solving, & Technical Training**, we immediately have an effective and a pragmatic system of education, which is based upon the real, day-to-day challenges of converting diecutting.
- ✓ This initiative represents one of the most important opportunities in diecutting converting. Because by focusing all of the talent, all of the knowledge, and all of the experience of all of the team members, daily productive improvement will become a pragmatic reality.

Section Twenty:

Diecutting Quality Management: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Describe the current role of Quality Control & Management in your organization?
- ✓ What is one of the important ways of describing any form of manufacturing?
- ✓ What is Quality Control & Management primarily focused upon?
- ✓ Name three reasons for errors and mistakes in diecutting converting?
- ✓ What is the primary source for the development of new knowledge and experience in diecutting-converting?
- ✓ How does your organization record, diagnose, and solve problems?
- ✓ How does your organization share solutions and then train the entire team in the new technique?
- ✓ Why do you think it is difficult to announce you have encountered a problem you are unable to resolve?
- ✓ What is the Problem-Cause-Solution-Innovation discipline, and why is it so important in process improvement?
- ✓ Why does a failure to use standard operating procedures undermine problem detection and problem solving?
- ✓ How does the Quality Control & Management team currently interact with the Diecutting-Converting team?
- ✓ Why is teaching a unified method of Problem Solving such an important step for the organization?
- ✓ What are the three key questions to ask in a fast task close-out?
- ✓ What are the seven steps in the problem solving procedure?
- ✓ What are three of the key goals of the Quality Control & Management Team in diecutting-converting?
- ✓ What are the areas of diecutting-converting expertise should the Quality Control & Management Team be trained in?
- ✓ How should the organization record, collect, brainstorm, and implement problems and solutions?
- ✓ What role should Quality Control & management play in Diecutting-Converting?

Manufacturing System of Organization

Section 21: Diecutting System Maintenance

Key Definitions: ... work that is done regularly to keep a machine or piece of equipment, in good condition & working order ... of keeping something in proper condition ... activities, such as tests, measurements, replacements, adjustments and repairs, intended to restore or retain a functional unit in a specified state in which the unit can perform its required functions ...

The System Maintenance Mission Statement: "It is the mission of the Pre-Press Team and the Press Team to conduct preventative maintenance and maintenance activities; safety inspection and testing; cleaning and housekeeping, and Just-In-Time organization and Inventory Management of the complete diecutting system of manufacturing."

Diecutting System Maintenance:

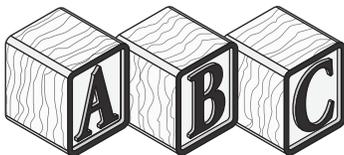
An Overview

"The quality of employees will be directly proportional to the quality of life you maintain for them." ~Charles E. Bryan

The diecutting-converting process is in reality a continual experiment as we search (research), for simpler, faster, and better ways to manufacture cartons and containers. Naturally, our primary goal is to meet production deadlines and deliver the product quality and consistency, at a time and at a cost, which meet customer requirements. However, we are continually learning as we discover more effective methods and practices, as we solve problems and develop innovative solutions, and as we gain a more comprehensive understanding of the diecutting process.



In this manual we have described a number of alternative methods for capturing and sharing improvement, including creating Standard Operating Procedures, and ultimately, in creating a series of videotape techniques or lessons, to help get everyone to know, what everyone knows.



It is obviously vital to combine our knowledge and skill, and to incrementally get better and better, as a cohesive team.

But how do we maintain, preserve, protect and stabilize the current system of manufacturing? And how do we preserve, protect, and stabilise the technology, the tools, and the equipment, our production activities and liveli-

hood depend upon?

The answer is System Maintenance.

System Maintenance is a important technique, which should be integrated into daily activities, to ensure optimal safety and optimum performance. The output potential of any system of manufacturing is a function of how well that system is maintained, how well it is organized, and how safe it is for all of the participants. It is far easier to work safely, to learn, to be efficient, and to succeed, when utilizing a systematic approach, in which every step forward is consolidated and consistently executed.

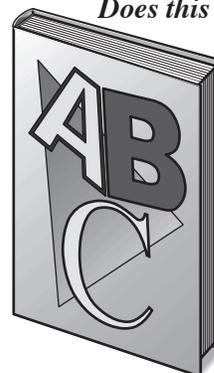
Why is this a problem in diecutting?

System Maintenance: Problems & Solutions

"Setting a goal is not the main thing. It is deciding how you will go about achieving it and staying with that plan" ~Tom Landry

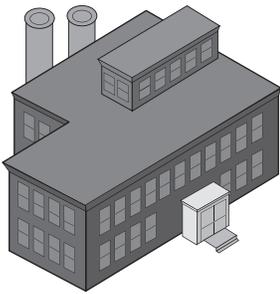
The goal in manufacturing is to build and maintain a production engine which is safe to operate, which is completely reliable, which is flawless in operation, which is always ready to work, which is consistent in performance, and which is inexpensive to run.

Does this describe your system of diecutting manufacturing?



An efficient and an effective system of manufacturing is constantly changing, is defining new standards, is benchmarking to measure performance, is closing-the-loop, and using new information and new experience to streamline, and to simplify.

The ABC's of Fast Diecutting Press Changeover!



To be the best it is obviously vital to work together as a cohesive team, however, this is impossible if everyone is doing things differently. In practice, the goal of organizing with the precision of a Hospital Emergency Room, and chang-

ing over from one job to the next with the speed of a NASCAR Pit Crew, is impossible if the procedures, the tools, the equipment and the work areas are not organized in a consistent fashion, and are not in the optimal operating condition. If every work area is different every time, how can we possibly standardize, benchmark, streamline, simplify and improve?

It is a basic principle of manufacturing, that training, process improvement, and productive growth are severely inhibited by poorly organized, inconsistent, and non-standard work-areas. Compounding this problem is the enemy of progressive improvement and continual skill development, that is tools, equipment and technology which are in poor operating condition. It is obviously far easier to improve individual and team performance if every work area is organized in the same way, and every tool, piece of equipment or technology is in optimal condition, and it works the way it is supposed to work.

Everything used in diecutting must be regularly examined, checked, certified, and upgraded where necessary.

This is a key problem in current diecutting organizations - we have no system to build and preserve systems! Every type of manufacturing is assembled like a jigsaw puzzle, from individual components, piece-by-piece, which must lock together to create a complete and a seamless picture.

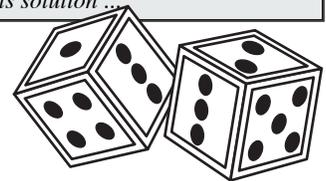
To maintain and protect the diecutting system of manufacturing we choose six key disciplines or puzzle pieces, and upon this foundation we can build a standardized and complete system of manufacturing. These disciplines are:

- SAFETY
- PREVENTATIVE MAINTENANCE
- MAINTENANCE

- CLEANING & HOUSEKEEPING
- JUST-IN-TIME ORGANIZATION
- INVENTORY MANAGEMENT

This is a critical challenge we face in diecutting manufacturing. If we fail to develop a standardized system of maintenance, performance deteriorates, however, if we implement a standardized system of maintenance, performance stabilizes, and daily progressive improvement become a reality.

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...



It would appear that our primary problem in attempting to generate consistent fast diecutting press changeover is caused by poor preparation and organization of the tools, supplies, materials, equipment and technology, and a failure to clean and maintain every tool, piece of equipment, and key technology in optimal operating condition.

However, our main problem in this discipline is our failure to implement a **systematic approach** to comprehensively and consistently organize each work area, and in developing a **systematic approach** to maintaining the tools and equipment in optimal condition.

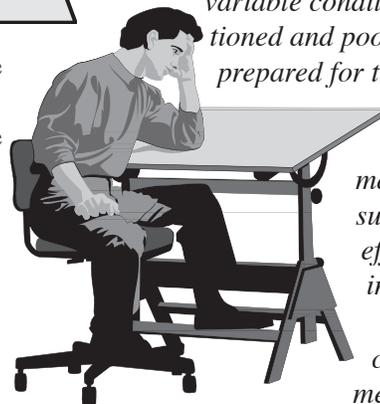
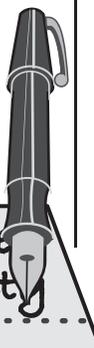
These issues are largely ignored by most organizations!

So what are the critical problems?

- The organization is intimidated by the challenge of getting every participant to agree upon a consensus approach to work organization.
- Every participant uses different tools which are in variable condition, they are randomly positioned and poorly organized and incorrectly prepared for the activity.

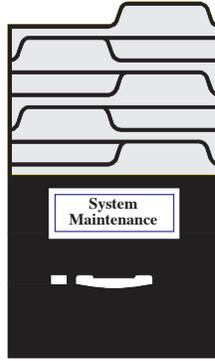
→ Looking for, retrieving, or choosing the correct tool, material, part, component, and supply consistently undermine efficient working and process improvement.

→ Tools, supplies, parts, components, materials, equipment, and information are rarely



pre-positioned for efficiency, for speed and for just-in-time convenience.

- Key On-Press and Off-Press work areas are poorly delineated, poorly organized, and ill prepared for key activities.
- Damaged, worn, or incomplete tools, materials, supplies, parts, and components undermine productivity and completion of key tasks in a timely fashion.
- Little or nothing is done to compensate for or to address the inevitable wear and degradation of tools, equipment, and technology.
- Training, Skill Development & Teamwork is complex and impossible to manage because methods and practices, and preparation and organization, vary from individual-to-individual and from press-to-press.
- Standardization, Benchmarking & Process Improvement is complex and impossible to manage because methods and practices, and preparation and organization, vary from individual-to-individual and from press-to-press.

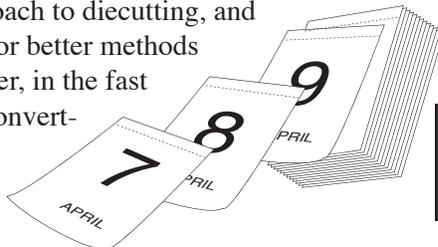


The bottom-line is work and work areas are poorly organized; time is lost in every make-ready looking for or retrieving tools and supplies; and there is no effective system of maintenance, housekeeping, and inventory management; there is no systematic approach designed to ensure everything involved in press changeover, is in the right place at the right time, and is in optimal condition!

The longer these basic manufacturing actions are put off the greater the damage, the greater the cost, and the greater the difficulty in reversing poor habits and behavior.

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

Every professional diecutter would agree that it is obviously critical to work safely, to develop a well organized and a consistent approach to diecutting, and to continually strive for better methods and practices. However, in the fast moving dynamic of converting production, these good intentions simply disappear.

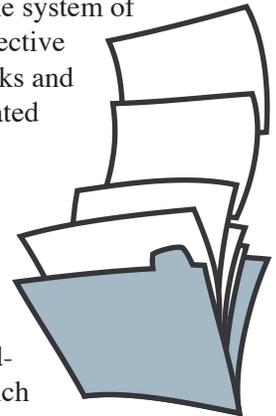


The result is a poorly organized, untidy, inconsistent, and unsafe work environment, where the system of manufacturing reflects a lack of focus, years of neglect, and organizational apathy. What are the common reasons for this poor approach to diecutting manufacturing?

- It is not my job and I am not qualified, and I am not willing to take on additional responsibility!
- We have a Trade Union which defines lines of demarcation and restrictions on what I can do!
- The equipment is old and beaten anyway, and we replace or repair something when it breaks!
- We already have too much to do, and if we are trying to reduce changeover time, what is the logic of adding more duties to the discipline!
- If it is that important, why haven't we done this before?
- Organizing all of the "stuff" required for these activities is simply too complicated!
- There are already too many things to remember, and we are not trained, or knowledgeable, or experienced in some of these tasks and actions!
- How do we get organized, and how do we get started?

These are all reasonable reactions, when the discipline of System Maintenance is described to work teams. However, everyone recognizes the importance of these activities, and they readily conceded, the system of manufacturing would be more effective if these duties and tasks, and checks and balances were consistently integrated into daily work practices.

System Maintenance represents an invisible problem, which although it is real and very damaging to productive output, it falls between the cracks, and is only addressed when there is a crisis, which interrupts production!



This obvious and common saying is appropriate to this attitude. ***"We don't have time to do it right, but we always find time to do it over!"***

The standard reaction to the proposal of a system of maintenance in diecutting, is it is recognized as important, but the immediate questions are, how do we get organized? So, how can we put together a practical and an effective solution to this problem?

The ABC's of Fast Diecutting Press Changeover!

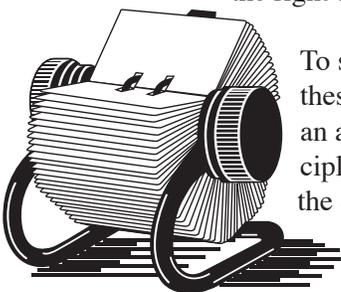
SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

The solution to all of these issues is to implement a systematic approach to diecutting manufacturing which converts complex and important disciplines into simple and easy to execute tasks and steps. Once this comprehensive approach to process improvement and maintenance is in place, it will require minimal organizational effort, and it will ensure critical areas of press operation and management are preserved, protected and upgraded on a daily basis.

Therefore the first step is to choose the key disciplines to be integrated into a system of protection and improvement. We recommend beginning with six key disciplines:

- ➔ SAFETY
- ➔ PREVENTATIVE MAINTENANCE
- ➔ MAINTENANCE
- ➔ CLEANING & HOUSEKEEPING
- ➔ JUST-IN-TIME ORGANIZATION
- ➔ INVENTORY MANAGEMENT

The reasoning behind choosing these disciplines, is clearly *Safety* is a primary objective; *Preventative Maintenance and Maintenance* are essential to keep the press peripheral equipment in optimal condition; *Cleaning and Housekeeping* are designed to keep the equipment and the work areas in pristine and efficient operating condition; *Just-In-Time Organization* is designed to maintain the press work areas in cells in the Hospital Operating Room degree of organizational effectiveness; and *Inventory Management* is designed to make sure everything that is necessary to an effective operation, is in the right place, in the right quantity, in the right condition, and at the right time.

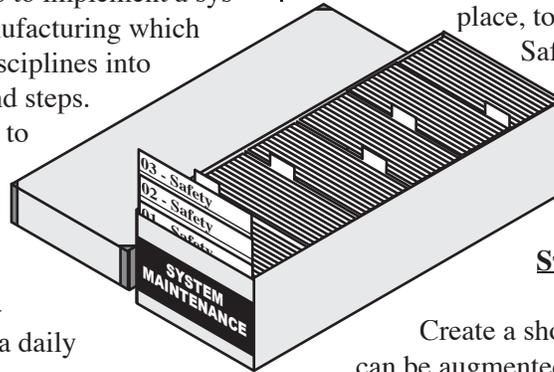


To simplify the organization of these disciplines, it is obviously an advantage to choose one discipline, (Safety), and implement the System Maintenance for this activity.

STEP ONE:

Brainstorm the Safety discipline, and break it down into a list of the smallest executable step, task, or action.

This could be to test one guard, to verify one Emergency Stop Button, to verify the First Aid Procedures are in place, to check the Lock-Out Tags, to verify Safety Glasses are in position, etc. Safety means anything and everything, which can impact or undermine the safety of the individual and the work teams.



STEP TWO:

Create a short description for each step, which can be augmented by diagrams, digital photographs, or video thumbnail, and allocate a Key Word or an Identification Number/Code for each individual step.

STEP THREE:

Sequence each step, time each step, and determine repeats and the number of repeats.

STEP FOUR:

Identify the tools, the materials, supplies, information and resources required to complete each step. Determine a permanent or temporary on-press storage location for these materials. (These supplies would naturally fit into the Inventory management discipline.)

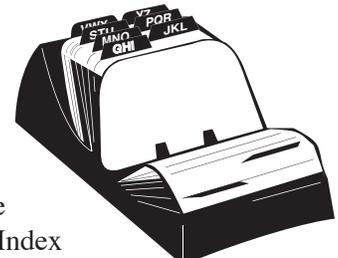
STEP FIVE:

Create a short Standard Operating Procedure for each step/action, should this be necessary. (Note if the task takes longer than five minutes it may be necessary to break the task down into smaller steps. However, if this is impractical, it will be necessary to schedule the activity independently, allocate the task to a non-changeover team member, or schedule the action as a separate activity.)

STEP SIX:

Choose a method of System Maintenance Documentation.

My recommendation is to use a card system, such as 5x8" Index



The ABC's of Fast Diecutting Press Changeover!

Therefore a logical innovation is to gradually incorporate other critical changeover procedures into this system of management and control. These could include:



"Failure is simply the opportunity to begin again, this time more intelligently."
Henry Ford

- ➔ ***INFORMATION MANAGEMENT***
- ➔ ***PRESS FORMATTING***
- ➔ ***TOOL INSTALLATION***
- ➔ ***CREASING & FOLDING***
- ➔ ***RESEARCH & DEVELOPMENT***
- ➔ ***FEEDER SET-UP***

This is by no means a definitive list, however, by using a daily incremental and non-complex approach to building a highly effective system of manufacturing, eventually the entire changeover process will be systematized.

As a reminder, it is useful to reiterate that the last act of establishing a benchmarked standard operating procedure, is to videotape



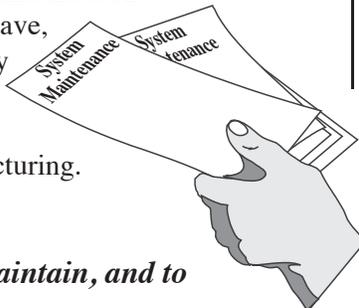
the entire sequence of steps and actions with a voice-over guide. This will provide a powerful and a very effective training tool.

The Goals of Diecutting System Maintenance:

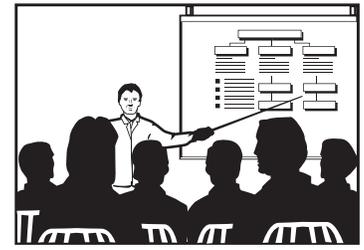
"I must create a System or be enslaved by another man's." ~William Blake

The problem we face in diecutting, is there is a system in place which is working, however, one which is consistently ineffective, is different from operator to operator, and it is randomly executed from one changeover to the next. Without a focus on a ***"system of working"*** everything inevitably deteriorates. The system maintenance discipline provides the tools and the techniques to preserve what we have, to protect it from unnecessary deterioration, and to incrementally build a productive system of diecutting manufacturing. These benefits include:

- ➔ ***To establish, to maintain, and to***



improve the safest working environment for the professionals who work in diecutting, and for the people who visit the department.



- ➔ ***To remind every participant about safety, protection of tools and equipment, and to continually reinforce the importance of a "systematic" approach to diecutting manufacturing.***
- ➔ ***To maintain and enhance the value of the investment in tools, technology, and people.***
- ➔ ***To continually review and upgrade all key methods and practices.***
- ➔ ***To teach and to reinforce the importance of standardization, of simplicity, of consistency, and of sharing ideas and solutions.***
- ➔ ***To create and maintain a working environment which dictates positive productive behavior, and which reinforces conformance to best practices.***
- ➔ ***To constantly reinforce the importance of teamwork, of working together to develop the best practices, and of consistently applying approved practices and procedures.***
- ➔ ***To make it easier to get organized and to stay organized.***
- ➔ ***To set-up an early detection system to identify mechanical problems before they can become serious issues.***
- ➔ ***To keep equipment and supporting tools in optimal operating condition, and to extend the***





"Time is the one thing we possess. Our success depends upon the use of our time, and its by-product, the odd moment."
Arthur Brisbane

productive lift of the diecutting work center.

- ➔ To maintain a professional and well organized appearance ready for unexpected customer visits.

The goal of System Maintenance is simple. To protect what we have and to improve what we have!

Diecutting System Maintenance: Methods & Practices

"We have institutions, we have a system, people have to pledge by rules and as in any democracy then you have to live by those rules." ~Bertie Ahern

Although we recommend a series of methods and practices, this is not a complex concept, and execution can and should be as simple and as seamless as possible. The message is, start small and slowly, but the important issue is, start, and keep going!

There are a number of steps in this process which will help to get the process started. These include:



- ➔ Choose one activity of the six to begin, Obviously our recommendation is to begin with Safety.
- ➔ Get the entire work team together and conduct a training and brainstorming session to make sure everyone understands the system maintenance process, and how the discipline is intended to work, and to give everyone a chance to discuss the system, to make suggestions and to ask questions.
- ➔ In the early stages of the project it is a good idea to repeat these meetings, to discuss changes and opportunities, to share ideas and information, and to resolve problems and bottlenecks.



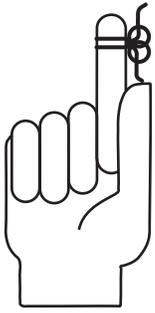
"We must open the doors of opportunity. But we must also equip our people to walk through those doors."
Lyndon B. Johnson

- ➔ Brainstorm & define all of the steps, tasks, and action required for the discipline under analysis.
- ➔ Brainstorm and break all of these activities into the smallest possible, independent executable action.
- ➔ Brainstorm and divide the press, the platform, and the surrounding close proximity areas, where the discipline will take place, into logical and named activity zones, to simplify organization.
- ➔ Brainstorm & list all of the tools, parts, components, supplies, equipment, materials, and information required to complete each activity.
- ➔ Create a map of the work area/work zones the activity takes place in, and identify the permanent or temporary position of all of the items required to support and complete each activity.
- ➔ Position everything required in a logical, clearly designated storage location, color coded for simplicity, in single source shadow boxes, and duplicate tools or supplies in different locations, where necessary.
- ➔ Once each primary discipline has been broken down into individual steps and sequenced, with necessary repeats, each step should be printed/written on an individual index card or a Roladex card, with the sequence priority for execution.
- ➔ Use both sides of the card, and select a



large enough index card, so it can contain all of the information about the description

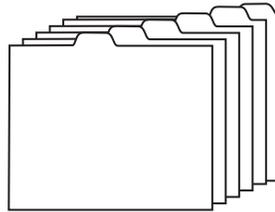
The ABC's of Fast Diecutting Press Changeover!



of the task, the tools and materials needed, and an area of the card, to capture the date and the initials of the person completing the task. Include an area for comments, suggestions, and changes, however, a large size post-it-note is also very effective for this, as the note will stand-out during analysis/ evaluation of the system maintenance procedure.

- ➔ **Integrate a System Maintenance Checklist, to make sure everything is in place and a Purge and Replace post process checklist, to ensure everything has been replenished accordingly. Both checks can be completed during production, before and after the changeover procedure.**

It is important to use a slow and steady incremental approach with the establishment of this method of manufacturing management. Do not attempt to put everything together overnight or in haste. The most effective method of putting together an effective system maintenance approach is to use the system maintenance approach!

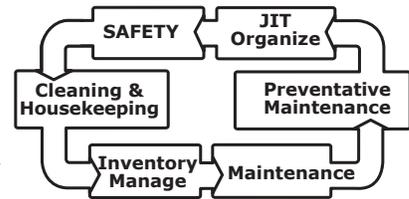


Diecutting System Maintenance: The Benefits of Change

"I always have to work something through my system until it's absolutely in my own dialect and it's comfortable to me." ~Robert Wyatt

The System Maintenance discipline is a simple but effective method of building a professionally organized diecutting operation, and an operation in which the tools and technology are maintained in optimal condition. Some of the benefits include:

- ➔ **Gradually and painlessly building an efficient system of diecutting manufacturing.**
- ➔ **Keeping the system of converting manufacturing in optimal condition.**
- ➔ **Improving Safety, Speed and consistency, while simultaneously, reducing operating cost.**



- ➔ **Standardization and full integration of critical tasks and actions.**
- ➔ **Providing a Training System and a Standard Operating Procedure development system.**
- ➔ **Forcing everyone involved to adapt to and to follow the best practices of the entire team.**
- ➔ **Preventing and slowing the relentless deterioration of the press and press components.**
- ➔ **Enabling a consistent focus on important, but frequently overlooked disciplines.**
- ➔ **Improving safety, productivity, quality, throughput, performance and speed to market.**



- ➔ **Implementing a daily reminder to prevent the changeover team and press crews from ignoring key issues.**

- ➔ **Implementing a daily reminder to prevent individuals and teams from reverting to old habits and practices.**
- ➔ **Keeping the system of converting manufacturing in optimal condition.**

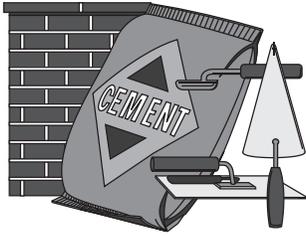
System Maintenance, as the name suggests, is a method of preserving and protecting current technology and operating procedures, a method to consolidate the best practices from the entire team, and a method to integrate new ideas and to standardize around competitive benchmarks.



Diecutting System Maintenance:

Recommended Actions

"The founding fathers were not only brilliant, they were system builders and systematic thinkers. They came up with comprehensive plans and visions." ~Ron Chernow



Implementing a System Maintenance discipline is obviously a radical departure from standard operating procedures, and as it represents a major change for the work

teams, the introduction of the program should be handled with care and patience.

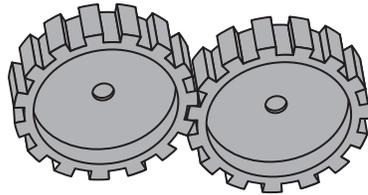
The very basic steps we recommend include the following actions.

STEP ONE:

The first step should be to announce and describe the project, a basic outline of what it does and how it works to all of the work teams and individuals involved.

STEP TWO:

The second step should be to form a System Maintenance Project team, with representatives of each group involved as team members.

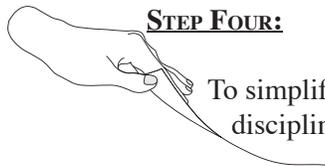


STEP THREE:

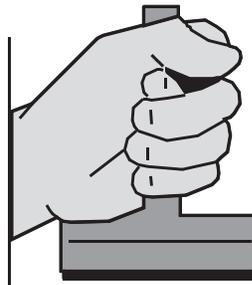
When the System Maintenance Project Team has had sufficient time to plan and organize the first phase of the project, they should hold a meeting with the entire team, to describe the project, to brainstorm methods and practices, and to give everyone involved the opportunity to outline problems and solutions, and to add ideas and suggestions.

Naturally, as the project moves forward there should be a series of meetings scheduled to keep this process of active involvement going.

STEP FOUR:



To simplify the organization of these disciplines it is obviously an advan-



SYSTEM MAINTENANCE

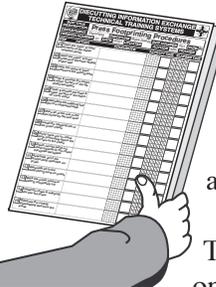
tage to choose one discipline, Safety, and implement the System Maintenance for this activity.

In practice, it is usually more effective to implement the system, one discipline at a time, on one press at a time. In this way all of the problems, issues, and constraints will have been ironed out

before the discipline is integrated into the entire department.

STEP FIVE:

The most logical, and in many ways the most simple way to begin, is to choose the safety discipline as the first step in creating a systematic approach.



Brainstorm and analyze the Safety discipline, and break it down into a list of the smallest executable step, task, or action.

This could be to test one guard, to verify one Emergency Stop Button, to verify the First Aid Procedures are in place, to check the Lock-Out Tags, to verify Safety Glasses are in position, etc. Safety means anything and everything, which can impact or undermine the safety of the individual and the work teams.

STEP SIX:

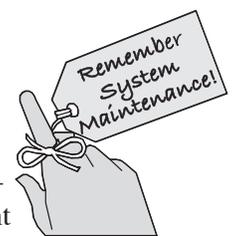
Create a short description for each step, which can be augmented by diagrams, digital photographs, or video thumbnail, and allocate a Key Word or an Identification Number/Code for each individual step.

STEP SEVEN:

Sequence each step, time each step, and determine repeats and the number of repeats.

STEP EIGHT:

Identify the tools, the materials, supplies, information and resources required to complete each step. Determine a permanent or temporary on-press storage location for these materials. (These supplies would naturally fit into the Inventory management



The ABC's of Fast Diecutting Press Changeover!

discipline.)

STEP NINE:

Create a short Standard Operating Procedure for each step/action should this be necessary. (Note: if the task takes longer than five minutes it may be necessary to break the task down into smaller steps. However, if this is impractical, it will be necessary to schedule the activity independently, allocate the task to a non-changeover team member, or schedule the action as a separate activity.)

STEP TEN:

Choose a method of System Maintenance Documentation.

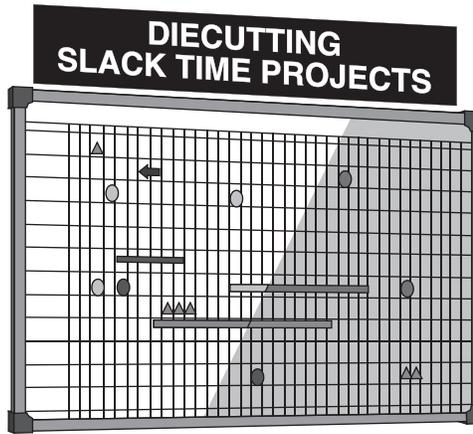
My recommendation is to use a card system, such as 5x8" Index Cards, which are stored in a plastic container, with appropriate dividers. Several people have chosen to use a Roladex type of system, and others have selected a system using smaller index cards.

Each card would document each basic step in each discipline and be stored in the sequence to reflect the frequency of execution.

Each card or each step should be given an identification of sequence number so it can be kept in place and/or reordered as the discipline expands.

One of the key advantages of the card system is cards can be added, removed and reordered as necessary.

Changes, comments, or further actions can be added to a comment section on the card, and signalled with a post-it-note for further analysis at the end of the changeover cycle.



At the conclusion of the make-ready the card is replaced at the back of the set of cards in the appropriate discipline. In this way activities are continuously recycled, and obviously if more repetitions of an action are required, a duplicate card is added.

If there is insufficient time to complete one or more of the disciplines, the cards representing the incomplete actions are replaced at the start of the cards in the appropriate discipline.

Each activity/card is checked with the date and the initials of the press technician to signal completion.

SUMMARY:

This is a very simple system, which is bullet proof in operation, however, even so, we recommend starting slowly, review and revise as necessary, and begin with as few as five cards/actions in each discipline.

If more time is needed for more changeover steps, then the changeover team can be expanded with someone who is part of the press team, but is not currently involved in press make-ready, whose primary responsibility is System Maintenance.

When possible, determine what tasks can be safely scheduled during press production, to minimize the impact on press changeover.

System Maintenance represents one of the simplest and yet most effective systems for building and preserving a World Class System of Diecutting Manufacturing.

STEP ELEVEN:

Implementation is very simple. As part of the preparation for the press changeover, the next card/action in each discipline is lifted out and integrated into the changeover activity.



Section Twenty One:

Diecutting System Maintenance: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ The diecutting-converting process is in reality a continual experiment as we search (research), for simpler, faster, and better ways to manufacture cartons and containers.
- ✓ But how do we maintain, preserve, protect and stabilize the current system of manufacturing? And how do we preserve, protect, and stabilise the technology, the tools, and the equipment, our production activities and livelihood depend upon?
- ✓ This is a key problem in current diecutting organizations - we have no system to build and preserve systems! Every type of manufacturing is assembled like a jigsaw puzzle, from individual components, piece-by-piece, which must lock together to create a complete and a seamless picture.
- ✓ The bottom-line is work and work areas are poorly organized; time is lost in every make-ready looking for or retrieving tools and supplies; and there is no effective system of maintenance, housekeeping, and inventory management; there is no systematic approach designed to ensure everything involved in press changeover, is in the right place at the right time, and is in optimal condition!
- ✓ To maintain and protect the diecutting system of manufacturing we choose six key disciplines or puzzle pieces, and upon this foundation we can build a standardized and complete system of manufacturing. These disciplines are:

➔ **SAFETY**

➔ **PREVENTATIVE MAINTENANCE**

➔ **MAINTENANCE**

➔ **CLEANING & HOUSEKEEPING**

➔ **JUST-IN-TIME ORGANIZATION**

➔ **INVENTORY MANAGEMENT**

- ✓ The reasoning behind choosing these disciplines, is clearly **Safety** is a primary objective; **Preventative Maintenance and Maintenance** are essential to keep the press peripheral equipment in optimal condition; **Cleaning and Housekeeping** are designed to keep the equipment and the work areas in pristine and efficient operating condition; **Just-In-Time Organization** is designed to maintain the press work areas in cells in the Hospital Operating Room degree of organizational effectiveness; and **Inventory Management** is designed to make sure everything that is necessary to an effective operation, is in the right place, in the right quantity, in the right condition, and at the right time.
- ✓ The System Maintenance discipline represents a simple and effective method of establishing, stabilizing, and improving key procedures. Using an incremental method of breaking complex tasks and activities into small, manageable, bit size pieces, even the most complex of activities can be mastered day-by-day, and changeover-by-changeover.
- ✓ However effective mastering these six key disciplines is, everything is important in diecutting manufacturing, and every detail matters and is critical to productive performance. Therefore, eventually every activity involved in press make-ready should be integrated into this system.
- ✓ System Maintenance, as the name suggests, is a method of preserving and protecting current technology and operating procedures, a method to consolidate the best practices from the entire team, and a method to integrate new ideas and to standardize around competitive benchmarks.
- ✓ This is a very simple system, which is bullet proof in operation, however, even so, we recommend starting slowly, review and revise as necessary, and begin with as few as five cards/actions in each discipline.

Section Twenty One:

Diecutting System Maintenance: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ How is your diecutting operation organized to stabilize and standardize approved practices?
- ✓ How does your operation stabilize, protect, and preserve the diecutting system of manufacturing??
- ✓ Why is the discipline described in this chapter called "System Maintenance?"
- ✓ What are the six recommended disciplines recommended to start the System Maintenance program?
- ✓ What is the most important discipline in this system and why?
- ✓ How would you rate the condition of the diecutting equipment and technology you use, and how is it maintained and improved?
- ✓ How are all of the parts, components, tools, materials, supplies and information assembled for each make-ready cycle?
- ✓ If you had the authority to reorganize your current diecutting system of manufacturing,

where would you begin, and why?

- ✓ What are the primary obstacles you can see in your organization, which would slow or inhibit the implementation of this system?
- ✓ How would you describe the benefit of working in any environment organized with the precision of Just-In-Time Organization and an effective Inventory Management System?
- ✓ How would you describe the use of Index Cards to manage and organize this system, and can you think of an effective alternative?
- ✓ What do you see the advantage of subdividing the press, the press platform and the surrounding close proximity areas into designated work zones?
- ✓ If you were to replace or augment the six disciplines recommended here, what disciplines would you select?
- ✓ Are you currently using a Changeover/NASCAR Pit Crew Team to complete press make-ready, and if not, why not?
- ✓ What are the first three steps of implementation, and why are these steps so critical?
- ✓ How would you recommend your organization utilize, adapt, and begin implementation of the System Maintenance Discipline?

Manufacturing System of Organization

Section 22: The Facilitator/Mentor/Coach

Key Definitions: ... somebody who enables a process to happen, especially ... who encourages people to find their own solutions to problems or tasks ... a person responsible for coordinating the work of a group ... someone who skillfully helps a group of people understand their common objectives & plan to achieve them without personally taking any side of the argument ...

The Facilitator-Mentor-Coach Mission Statement: "It is the mission to facilitate education, training and teamwork; to build team relationships, through cooperation and communication; to stimulate knowledge and skill development, to build competence and confidence; and to assist each individual and team to reach their productive goals."

The Facilitator/Mentor/Coach:

An Overview

"Deliberate with caution, but act with decision, and yield with graciousness, or oppose with firmness."

~Charles Caleb Colton

Our most powerful resource is obviously the individuals and the teams who form the backbone of any effective manufacturing operation. As the engine room of the diecutting operation, it is important to protect, to stabilize and to continually enhance the productive power of our work teams.



In addition, a key requirement of the work teams which is often overlooked, and a requirement which if not essential, is certainly more effective, is to ensure each team member is interchangeable with every other team member. This means an important part of training and re-training is to achieve performance parity and procedural uniformity throughout a work team as an outcome of the education process.

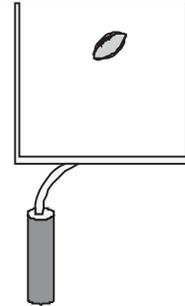
Therefore, the obvious solution to progressive improvement is to integrate education, training and retraining into the daily operating structure. Unfortunately, this is where we struggle, as training is poorly understood, consistently underfunded, and rarely scheduled and organized effectively.



Even the training we currently provide is largely ineffective, because of a failure to understand the basic and vital correlation between Training & Coaching.

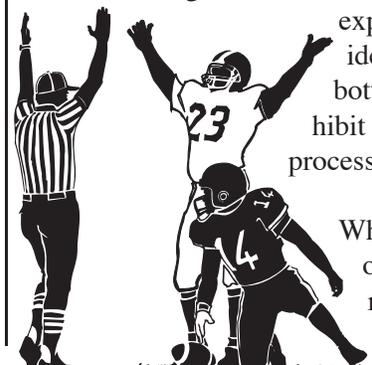
Training is only the beginning of

the education process. Each person needs to be coached to convert the training session or program they were taught into behavior development or behavior modification, which is simply the establishment of new or upgraded work habits. In practice, this means that for each individual element of training, each person needs to be coached and monitored through a sufficient number of repetitions of an activity, until they are able to execute the task consistently and flawlessly without supervision.



In practice, people resist change and perceived uncertainty, and it is essential to provide enthusiastic support and encouragement, to guide them in the right direction. The trainee feels better about the process if they can ask for advice, guidance and clarification, which in practice means the coaching/mentoring roles is less about enforcement, and more about reinforcement.

Coupled with this is the importance of making an assessment of performance, and developing a consultative role with the trainee to positively and enthusiastically guide their knowledge and skill development. In addition, the experienced facilitator can identify problems, issues and bottlenecks, which can inhibit the behavioral development process.



When you examine the goal of training and continual retraining the missing piece in the jigsaw puzzle is the

Training is:
Behavior Modification
 and/or
Behavior Development
 To make something a habit, do it;
 To not make it a habit, do not do it;
 To unmake a habit, do something
 else in place of it.

Mentor/Coach/Facilitator support position.

The Facilitator/Coach is the key to rapid, consistent, and effective performance improvement.

And while many would

dismiss this as an unnecessary expense, it is actually an investment, which pays dividends in fast effective training and in high performance work teams.

The Facilitator/Mentor/Coach: Problems & Solutions

"I shall try to correct errors where shown to be errors, and I shall adopt new views as fast as they shall appear to be true views." ~Abraham Lincoln

To underscore the previous section, we struggle in manufacturing, because when we train, we fail to consolidate behavioral development. What we need is guided, multiple repetitions of each procedure, using the correct sequence, the right methods, and the properly executed techniques.

This is particularly important when you recognize that the majority of procedures are too complex, too long, or too involved to memorize perfectly. And every time someone uses the wrong sequence, or an incorrect practice, they are reinforcing the wrong behavior. In addition, it is hardly effective or good practice to work with a printed SOP in hand!

That is why training takes far too long.

Therefore, it is a tremendous advantage to have someone observing, who is watching what you do, and is ready to provide corrective action, or to provide a positive critique of the activity, immediately on completion.



Without this form of positive guidance, the majority of individuals and teams struggle, get frustrated, and resort to and reinforce old habits.

A facilitator is like having a spotter. It is far easier for an observer to see what is and what is not effective, than the person trying to execute the procedure correctly. In addition, who will be able to



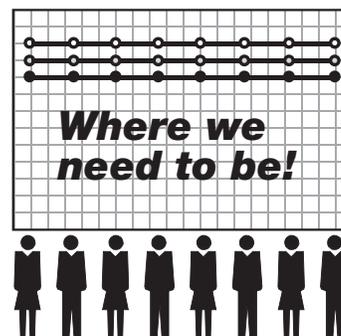
○ Knowledge ○ Skill ● Experience

compare one person to the next? Who will be able to detect, record, and report back on problems with the procedures, issues with the execution, and obstacles in the work place inhibiting precise completion? And who can provide the management team with an accurate picture of skill development progress?

In practice, there is no effective link between training and the development of competence and expertise. Without a coach, a facilitator or a mentor, individuals and teams inadvertently integrate a divergent mix of variables, they execute tasks in the wrong sequence, and they get frustrated when things do not work the way they are supposed to.

PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

Most organizations have unrealistic expectations of training, assuming that once someone has been shown how to do something, they are trained! But the primary problem, is when you watch the training it is done differently every time. The trainer gives different instructions, they use different tools, they use a different sequence, and they change the methodology they had previously demonstrated. This constant variation confuses the trainee, who will then execute the procedure inconsistently, and with a poor understanding of the activity he or she is trained in.



○ Knowledge ○ Skill ● Experience

What are the problems with this?

- ➔ *We do not Train-The Trainer.*
- ➔ *The Trainer is instructed by different people using different methods, different terminology, and a different sequence.*

- *The Trainers do not understand the importance of Behavior Development and Behavior Modification, and therefore consistency and precision are not evaluated as a key issues.*
- *The Training Program is not Documented.*
- *We do not have, nor do we use a Standard Operating Procedure as the primary training tool or guide.*
- *There is no record keeping, no monitoring of the number of repetitions, and no definitive measurement of success.*

In summation, training is an disaster in diecutting converting!

Even if the trainee has clear and explicit instructions, when they are executed, individuals tend to implement the same procedure differently every time, and start to develop divergent habits. Therefore, the majority of the investment in training is lost because of poor follow-up.

This is very important! When people make procedural mistakes, by repeating the incorrect procedure so many times, the wrong way becomes the right way! Bad habits become established institutionalized bad habits, because there is no mechanism to stop their consolidation.



It is vital to inject a mentor, a coach or a facilitator into the process to ensure there is an established procedure, the trainee is instructed properly and consistently, and the procedure is executed consistently by the trainee.

Training is not difficult, however, the way we execute the training process makes it unnecessarily complex and ineffective.

Apart from any other consideration, when people are trying to learn a series of explicit instructions, they need support, they need encouragement, and they need guidance. And that is the role of the Coach-Facilitator.



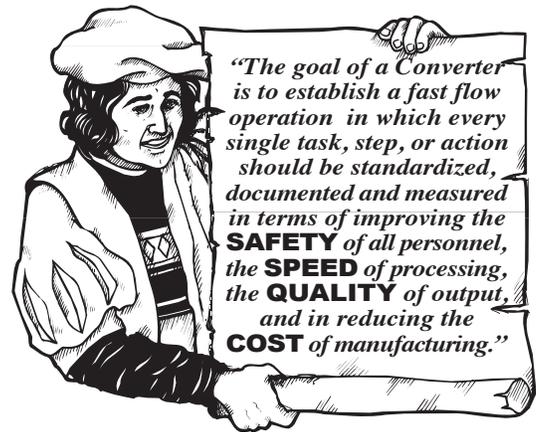
CAUTION



POOR FOCUS

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

There are few things more important to the survival and the long term prosperity of a converting company than the ability to continually educate and train individuals and work teams to achieve Master Craft status. We have the people, we have the resources, we just do not have a systematic approach to training and to behavior development.



As organizing and managing an effective training program is neither difficult nor complex, our perennial failure to take control of this critical discipline is hard to explain. However, some of the reasons we fail to take action include the following:

- *A failure to understand how training and behavior development are linked to performance success.*
- *A failure to commit to a consistently applied and a disciplined approach to building the process around standardized, documented procedures.*
- *A failure to prepare effectively, to allocate sufficient time and resources.*
- *A failure to allocate sufficient resources and time for the process to develop.*
- *A failure to teach everyone involved, the key principles of training, behavior development, and habit formation.*

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- A failure to implement and enforce a team approach to diecutting and to training.

memo **Behavior Development**

"Learning is for the future; that is, the objective of instruction is to facilitate some form of behavior at a point after the instruction has been completed."
Robert F. Mager

- A failure to develop a comprehensive plan of action, a failure to prepare and organize accordingly, and a failure to follow-through and close the loop.

- A failure to understand the importance of coaching support, and an inability to justify the resources for this key position.

In summation, training is a disaster because we do not understand the training process, nor do we plan, organize, and execute, with determination, with discipline and with a passion for the outcome.

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

The key to solving the training dilemma is to stay the course. The rest is straightforward. The last thing you need is another failed initiative!

"Training frequently fails to pay off in behavioral changes on the job. Trainees go back to work and do it the way they've always done it instead of the way you taught them to do it."
Ruth Colvin Clark

The first step in this process is to form a truly representative Diecutting Improvement Team. This is critically important, because we need a consensus,

and it will be far more effective if we integrate the best ideas from the entire team. And yes, this is probably the most difficult part of the process!

The second action is to bite the bullet and invest in a coach or facilitator, at least for the first cycle of SOP development and implementation. More on this later, however, for the moment the actions we need to take include:

- Form a Diecutting Improvement Team
- Research, interview, and select a Coach - Facilitator, with the full involvement of team

representatives.

- Brainstorm the Diecutting Process and break it down into key activities.
- Brainstorm each activity and break it down into individual procedures.
- Prioritize the analysis of each activity, and the development priority for procedures within each activity.

Job Position	PRESS ASSISTANT				PRESS OPERATOR										PRE-PRESS OPER		
	General Duties				Pre-Press	Press/Area		Purge		Changeover		Pre-Make-Ready		Pre-Make-Ready			
Task Category	Pre-Press	Press/Area	Purge	Changeover	Pre-Press	Press/Area	Purge	Changeover	Pre-Press	Press/Area	Purge	Changeover	Pre-Press	Press/Area	Purge	Changeover	
STANDARD OPERATING PROCEDURE																	
John Smith																	
Mary Jones																	
Susan Anthony																	
Peter Carew																	
Julio Sanchez																	
Angela Green																	
Andrew Barry																	
Teresa Brandon																	
Miguel Garcia																	
Steven Roberts																	
Warren James																	
Margaret Devon																	
Phillip O'Boi																	
Miguel Gonzalez																	
Jim Webb																	
Ray Webber																	
Keith Richards																	
Christine Rhodes																	
Julio Herrera																	

Stage 1 Not Trained Stage 2 Partially Trained
 Stage 3 Fully Trained Stage 4 Performance Proven

- Create the Training Map specified in Section 05. See above.

- Brainstorm and analyze the selected procedure and create a Standard Operating Procedure, using a consensus approach.

- Test, modify, approve and benchmark the completed procedure.

- Videotape the procedure with a voice over, instructional commentary. (One voice!)

- Choose the number of repetitions the team feels will provide sufficient time to develop effective behavior.

- Create the Peer Assessment Form specified in Section 05.

"There is a remarkable agreement upon the definition of learning as being reflected in a change of behavior as the result of experience."
E. A. Haggard

- The trainee watches the video a number of times and

then is provided with hands-on-training, until the trainee has fully grasped the basics of the procedure.

TASK PERFORMANCE EVALUATION: PROCEDURE: Leveling The Impression											
Trainee:	Evaluator: _____ Date: _____										
STEP 1	<table border="1"> <tr> <th>UNSATISFACTORY</th> <th>MARGINAL</th> <th>GOOD</th> <th>VERY GOOD</th> <th>EXCELLENT</th> </tr> <tr> <td>1 2 3 4 5</td> <td>6 7 8 9 10</td> <td>11 12 13 14 15</td> <td>16 17 18 19 20</td> <td>21 22 23 24 25</td> </tr> </table>	UNSATISFACTORY	MARGINAL	GOOD	VERY GOOD	EXCELLENT	1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25
UNSATISFACTORY	MARGINAL	GOOD	VERY GOOD	EXCELLENT							
1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25							
Calculate the preliminary tonnage adjustment from the job format, job history, and press characteristics	Comments/Suggestions										
STEP 2	<table border="1"> <tr> <th>UNSATISFACTORY</th> <th>MARGINAL</th> <th>GOOD</th> <th>VERY GOOD</th> <th>EXCELLENT</th> </tr> <tr> <td>1 2 3 4 5</td> <td>6 7 8 9 10</td> <td>11 12 13 14 15</td> <td>16 17 18 19 20</td> <td>21 22 23 24 25</td> </tr> </table>	UNSATISFACTORY	MARGINAL	GOOD	VERY GOOD	EXCELLENT	1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25
UNSATISFACTORY	MARGINAL	GOOD	VERY GOOD	EXCELLENT							
1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25							
Set the preliminary tonnage and take a single sheet impression	Comments/Suggestions										
STEP 3	<table border="1"> <tr> <th>UNSATISFACTORY</th> <th>MARGINAL</th> <th>GOOD</th> <th>VERY GOOD</th> <th>EXCELLENT</th> </tr> <tr> <td>1 2 3 4 5</td> <td>6 7 8 9 10</td> <td>11 12 13 14 15</td> <td>16 17 18 19 20</td> <td>21 22 23 24 25</td> </tr> </table>	UNSATISFACTORY	MARGINAL	GOOD	VERY GOOD	EXCELLENT	1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25
UNSATISFACTORY	MARGINAL	GOOD	VERY GOOD	EXCELLENT							
1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19 20	21 22 23 24 25							
Examine the back, and the front of the diecut sheet for full penetration, and pressure variation, and mark the low areas.	Comments/Suggestions										
STEP 4	<table border="1"> <tr> <th>UNSATISFACTORY</th> <th>MARGINAL</th> <th>GOOD</th> <th>VERY GOOD</th> </tr> <tr> <td>1 2 3 4 5</td> <td>6 7 8 9 10</td> <td>11 12 13 14 15</td> <td>16 17 18 19</td> </tr> </table>	UNSATISFACTORY	MARGINAL	GOOD	VERY GOOD	1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19		
UNSATISFACTORY	MARGINAL	GOOD	VERY GOOD								
1 2 3 4 5	6 7 8 9 10	11 12 13 14 15	16 17 18 19								
Select appropriate area patch-up material and test to the shape(s) of the low pressure areas.	Comments/Suggestions										

➔ *The Coach supervises the repetitions of the procedure, observes, critiques, guides, records obstacles and opportunities, notes problems and potential solutions, and highlights better ways to do things.*

➔ *The trainee is tested and certified in the procedure.*

These instructions have been reiterated a number of times in a number of sections in the manual, however, what is different in this example is the integration of a **Coach - Facilitator**.

"I never cease to be amazed at the power of the coaching process to draw out the skills or talent that was previously hidden within an individual, and which invariably finds a way to solve a problem previously thought unsolvable." --John Russell.

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

In every diecutting operation there are individuals who make exceptional trainers and effective team leaders. Many of these same people have the ability to learn and to become exceptional coaches and facilitators.

Therefore, the most innovative approach to the training dilemma is to

"Reinforcements continue to be important, of course, long after an organism has learned how to do something, long after it has acquired behavior. They are necessary to maintain the behavior in strength."
B. F. Skinner



➔ *Videotape key activities, such as press changeover, to give the entire team the opportunity to see key differences from agreed procedures, to understand the process, and to participate in a coaching*

hire a coach, who in addition to coaching the work teams, will train selected individuals as coaches. In fact, the coaching process he or she executes, is the perfect opportunity to train and to develop the most effective coaching behaviors.

Therefore, to develop a complete training and coaching team, the following recommendations should be considered:

➔ *Hire a Coach-Trainer, who in addition to his or her coaching duties, will teach the team leaders, the supervisors, and the trainers, the basics of coaching and facilitation.*

➔ *Research and invest in, with the guidance of the coach, appropriate training programs, workshops, and publications, to assist the development of in-house coaching.*



➔ *With the involvement of the coach/trainer, select a minimum of two individuals to train in this position.*

➔ *The coach/trainer should participate in several SOP Development, Training, and Certification sessions, with the team members so the trainee/coaches gain experience in the coaching-mentoring-facilitation process.*

➔ *Organize several sessions to give the trainee/coaches the opportunity to play the coaching role, under the supervision of the Coach/Trainer.*

➔ *Conduct many debriefing sessions with the trainee/coaches, to evaluate each session and to provide guidance and feedback to the trainee/coaches.*

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session, so everyone involved has a good grasp of the positive role of the coach.

- As the trainee/coaches gain experience, gradually phase out the involvement of the professional coach.
- Invite and schedule the Coach/Trainer to make an unexpected visit to the operation, to evaluate what is happening, and how effectively the coach-trainees, and the work teams are doing.

The ability to implement in-house train-the-trainer and coaching, is cost effective and it ensure the rapid development and the constant supply of professional crafts men and women.

The Goals of The Facilitator/Mentor/Coach:

"Leadership and Learning are indispensable to each other." ~John Fitzgerald Kennedy



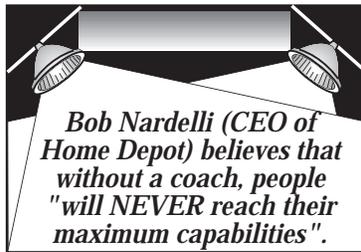
The primary focus in diecutting is speed. But without teamwork, even a talented collection of individuals is limited in their productive potential.

We certainly need individual competence, but it must be integrated with cooperation, consistency, and a collective determination to work together for success.

The ultimate goal of the coach is to support the development of technical expertise in the diecutting work team, but success will be predicated and it must be measured, based upon the teams ability to function as a cohesive team.

What should the coach develop in the diecutting work team?

- A unity of purpose.
- Team success built around individual success.



Bob Nardelli (CEO of Home Depot) believes that without a coach, people "will NEVER reach their maximum capabilities".



→ Procedural uniformity and performance parity.

- A "Systematic" approach to training, skill development, and expertise.
- A "Systematic" approach to problem solving, process improvement, and information sharing.
- A constant daily focus on research, on education, and on teamwork.
- A cooperative, consultative system of diecutting manufacturing, based upon professional relationships.

We are all familiar with the cliches of "all for one and one for all" and "leave no one behind," but this is the essential goal of training and coaching. Productive diecutting is not technically difficult, but building a cohesive team, is difficult, it is complex and it represents an ongoing challenge.

If we fail to build an effective team, the real benefits of technical excellence will be inhibited. However, if we can build and sustain an effective team, there are few limits on productivity and performance. This, more than anything, is why a professional coach is such an advantage in the initial phase of creating a world class system of diecutting manufacturing.

The Facilitator/Mentor/Coach: Methods & Practices

"Good leaders must first become good servants."

~Robert Greenleaf

The area were the diecutting-converter struggles with training and performance is in standardization of the process, and the formation of effective teams. If we focused on these issues, as we should and we must, then training and performance would become less of an issue. I often tell work teams I am beginning a program with; "You can execute these pro-



cedures anyway you want, as long as everyone does it the same way.”
In reality the knowledge, the skill and the experience is all in place. We just need the courage and the persistence to insist on standardization, and insist upon teamwork.

To implement the Coaching-Facilitation program, the most appropriate actions are:

- *Hire a Coach-Trainer, who in addition to his or her coaching duties, will teach the team leaders, the supervisors, and the trainers, the basics of coaching and facilitation.*
- *Research and invest in, with the guidance of the coach, appropriate training programs, workshops, and publications, to assist the development of in-house coaching.*
- *With the involvement of the coach/trainer, select a minimum of two individuals to train in this position.*
- *The coach/trainer should participate in several SOP Development, Training, and Certification sessions with the team members, so the trainee/coaches gain experience in the coaching-mentoring-facilitation process.*
- *Organize several sessions to give the trainee/coaches the opportunity to play the coaching role, under the supervision of the Coach/Trainer.*
- *Conduct many debriefing sessions with the trainee/coaches, to evaluate each session and to provide guidance and feedback to the trainee/coaches.*
- *Videotape key activities, such as press changeover, to give the entire team the opportunity to see key differences from agreed procedures, to understand the pro-*



cess, and to participate in a coaching session, so everyone involved has a good grasp of the positive role of the coach.

- *As the trainee/coaches gain experience, gradually phase out the involvement of the professional coach.*
- *Invite and schedule the Coach/Trainer to make an unexpected visit to the operation, to evaluate what is happening, and how effectively the coach-trainees, and the work teams are doing.*

The greatest challenge in training and in retraining is persuading people to compromise, and to accept the necessity of doing things which are a combination of the best ideas of the entire team. Bluntly, we tend to back down, when one of the leading craftsmen or women in the team, refuses to participate, or does so in a fashion which undermines and sabotages the efforts of the remaining team members.

You must attack this situation with all of the force you can muster, because your choice at this point is to either concede and to fail, or to fire the troublemaker, no matter who it is! A tough situation, but there is really no choice.

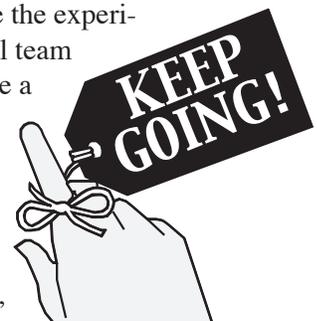


The Facilitator/Mentor/Coach: The Benefits of Change

“Endeavor to emulate the laser. Scan the landscape and manscape; electically collect observations and reflections; enlighten and illuminate; inform and educate; cut and sculpt with precision.” ~William C. Stwalley

Why will the Coach-Facilitator have a productive impact on current methods and practices? The dilemma we face is we have the people, we have the experience, and we have the potential team players, but we just do not have a way or the time to bring it all together.

There are many benefits of integrating coaching into the process improvement program,



The ABC's of Fast Diecutting Press Changeover!

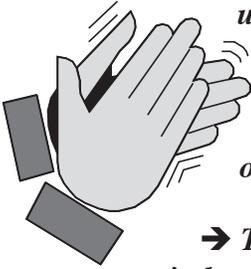
however, a few of the critical benefits are:



→ *The ability to develop a collaborative, cooperative system of combining all of the best ideas, the best techniques, and the valuable experience of the entire work team into a series of Standard Videotaped Operating Procedures*

→ *The integration of these “Current Best Operating Procedures” into a Training & Retraining Program, utilizing the Training Map and the Peer Certification System, is a powerful system for productive change.*

→ *The ability to guide and manage this process using a professional coach to encourage and to coordinate learning, behavior development and teamwork, is the answer to our productive goals.*



→ *The ability to develop and to train key team members as Team Leaders, Trainers, and Coaches, will drive teamwork and productive improvement.*

→ *The ability to accelerate productivity, quality, and performance in Diecutting-Converting will eliminate a perennial bottleneck in the system of manufacturing.*

The three things you must gain from this section are one, Standardization, two, Teamwork, and three, Coached Behavior Development. You get those right, the rest is easy!

The Facilitator/Mentor/Coach: Recommended Actions

“Leadership is a manager’s ability to get subordinates to develop their capabilities by inspiring them to achieve.” ~John A. Reinecke

The primary reason diecutting operations struggle with excessive operating cost, inconsistent yield, and inadequate speed to market, is they rely upon a group of individuals with significantly different levels of knowledge, skill and competence. In most operations individu-

als work using imprecise, non-scientific, inconsistently applied techniques and procedures, which have been proven time and again to be ineffective. Compounding this problem is there is no effective training program, no effective team building, and no effective plan of action to rapidly change the situation!



We are faced with intense and increasing pressure from an impatient marketplace, who seem to have an unlimited choice of cooperative suppliers. So what are the recommended actions we need to take?

→ *Give this project the highest priority and visibility in the organization, with full and demonstrable support from the top of the company, right through the management team.*

→ *Hire a Coach-Facilitator to coordinate Teambuilding, Standardization, Training and Certified Behavior Development.*

→ *Organize and build work teams around team-leaders, trainers, and in-house coaching/trainees.*

→ *Standardize, and ultimately, videotape every key procedure involved in diecutting manufacturing.*

→ *Implement the Training Map and the Skill Certification System, based upon demonstrated Behavior Development and Behavior Modification.*

→ *Invest in this process ... allocate sufficient resources for practice, practice, and more practice.*

→ *Don’t back down, don’t get cold feet, and stay the course.*

The investment in a professional coach is the missing piece in our productivity puzzle. We have everything in place, we just need to focus the talent and the existing knowledge, skill, and experience in a cohesive and a cooperative manner.



Section Twenty Two:

The Facilitator/Mentor/Coach: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ As the engine room of the diecutting operation, it is important to protect, to stabilize and to continually enhance the productive power of our work teams.
- ✓ A key requirement of these work teams, which is often overlooked, and a requirement which if not essential, it is certainly more effective, is to ensure each team member is interchangeable with every other team member.
- ✓ The obvious solution to progressive improvement is to integrate education, training and retraining into the daily operating structure.
- ✓ Training is only the beginning of the education process. Each person needs to be coached to convert the training session, or program they were taught, into behavior development or behavior modification, which is simply the establishment of new or upgraded work habits. In practice this means that for each individual element of training each person needs to be coached and monitored through a sufficient number of repetitions of an activity, until they are able to execute the task consistently and flawlessly without supervision.
- ✓ Therefore, it is a tremendous advantage to have someone observing, who is watching what you do, and is ready to provide corrective action, or to provide a positive critique of the activity, immediately on completion.
- ✓ In practice, there is no effective link between training and the development of competence and expertise. Without a coach, a facilitator or a mentor, individuals and teams inadvertently integrate a divergent mix of variables, they execute tasks in the wrong sequence, and they get frustrated, when things do not work the way they are supposed to.
- ✓ The first step in this process is to form a truly representative Diecutting Improvement Team. This is critically important, because we need a consensus,

and it will be far more effective if we integrate the best ideas from the entire team. And yes, this is probably the most difficult part of the process!

- ✓ The second action is to bite the bullet and invest in a coach or facilitator, at least for the first cycle of SOP development and implementation.
- ✓ It is vital to inject a mentor, a coach or a facilitator into the process to ensure there is an established procedure, the trainee is instructed properly and consistently, and the procedure is executed consistently by the trainee.
- ✓ In every diecutting operation there are individuals who make exceptional trainers and effective team leaders. Many of these same people have the ability to learn and to become exceptional coaches and facilitators.
- ✓ Therefore, the most innovative approach to the training dilemma is to hire a coach, who in addition to coaching the work teams, will train selected individuals as coaches. In fact, the coaching process he or she executes, is the perfect opportunity to train and to develop the most effective coaching behaviors.
- ✓ The primary reason diecutting operations struggle with excessive operating cost, inconsistent yield, and inadequate speed to market, is they rely upon a group of individuals with significantly different levels of knowledge, skill and competence. In most operations, individuals work using imprecise, non-scientific, inconsistently applied, techniques and procedures, which have been proven time and again to be ineffective. Compounding this problem, is there is no effective training program, no effective team building, and no effective plan of action to rapidly change the situation!
- ✓ The investment in a professional coach is the missing piece in our productivity puzzle. We have everything in place, we just need to focus the talent and the existing knowledge, skill, and experience, in a cohesive and a cooperative manner.

Section Twenty Two:

The Facilitator/Mentor/Coach: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ How is knowledge, skill and experience stabilized in the work team in your operation?
- ✓ What would you see as the advantages of everyone using standardized procedures?
- ✓ Is your diecutting operation run around an effective, cohesive team, and if not, why not?
- ✓ Is training in your organization organized around behavior development and behavior modification, and if not, why not?
- ✓ Is there an up-to-date, active and effective diecutting training program in use in your organization, and if not, why not?
- ✓ How is individual performance measured and evaluated in your organization? Is it effective?
- ✓ Has your organization experimented with or do they use documented or videotaped standard operating procedures, and if not, why not?
- ✓ Have you had any direct experience with personal coaching, and how successful do you think this approach to process improvement will be?

- ✓ Do you have trained-trainers integrated into the diecutting work team?
- ✓ What process improvement initiatives or programs are currently in place?
- ✓ How do your diecutting colleagues react to potential change, and why?
- ✓ Is there a great deal of disparity between the members of the diecutting team, and how does everyone feel about that?
- ✓ What recent efforts have been made to improve quality and productivity in diecutting?
- ✓ How did these programs work or fail, and why did they work and why did they fail?
- ✓ Are you allocated sufficient time to practice and develop new methods and techniques?
- ✓ What training have you received, and how would you rate the effectiveness of the program?
- ✓ Given the training program you are currently using, what would you specify as the strengths and weaknesses of this program?
- ✓ Would you consider training to be a coach or facilitator, and if not, who would you recommend for this role?

Manufacturing System of Organization

Section 23: Work Planning & Organization

Key Definitions: ... **Work Planning:** ...the technique of preparing a written sequence of instructions, reminders and action-checklists, designed to control a specific activity, to ensure the achievement and realization of a specific outcome ... a scheme or method of acting, doing, proceeding, making, etc., developed in advance ... refers to any method of thinking out acts and purposes beforehand ... the formulation of a program to ensure a definitive course of action, and one designed to achieve a specific outcome...

The Work Planning Statement: "It is the mission of the Work Team to develop an effective and an efficient plan of action, which maximizes the potential of all available resources, which anticipates obstacles, problems, and bottlenecks, which seeks to ensure everything needed to complete the planned activity, is in the right place, at the right time, and resources which are consistently applied and is continually revised and upgraded, as performance in each key activity is subsequently evaluated."

Work Planning & Organization:

An Overview

"Growth stresses systems." ~Larry McFadin

This manual is entitled "The ABC's of Fast Press Changeover," but in reality it should be; "The ABC's of Diecutting Work Planning." In fact, every single recommendation, and every productive action specified in this manual, requires precise, detailed pre-planning, meticulous organization, and checklist preparation. This is the most important recommendation in the manual, **because nothing will go to plan, if you don't have a plan!**

"No matter how high or how excellent technology may be and how much capital may be accumulated, unless the group of human beings which comprise the enterprise work together toward one unified goal, the enterprise is sure to go down the path of decline." Takashi Ishihara



To a large extent the planning or re-planning process will be dictated by which of the disciplines and the priority of the disciplines, the planning development team determines to implement. For example, System Maintenance, or Single Minute Exchange of Die, or Just-in-Time Manufacturing, require many things to be determined, many things to be organized, and many things to be put in place, before they can **begin** to be properly implemented.



In the beginning Work Planning is simply attempting to figure out what is necessary to prepare or to organize before an event, which will in turn ensure an efficient and an effective activity. Basic planning questions could include:

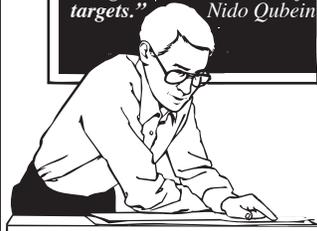
- What are we doing?
- Who is involved and how?
- How are we doing it?

- What do we need to complete the task?
- How will we measure success?
- What are the key constraints & benchmarks?
- Who makes decisions and why?

These and many other questions will need to be answered in the first phase of developing a Changeover Work Plan.

Implementing a Changeover Work Plan, is not an insignificant activity and it represents a major change to current methods and practices, and it represents a major upheaval for all the people involved. Therefore, it is important to be patient, to use a slow and a steady approach, and to make sure everyone involved or impacted by the change is given sufficient time to adjust and to get comfortable and familiar with the changes.

"Nothing can add more power to your life than concentrating all your energies on a limited set of targets." Nido Qubein



It is also pertinent to consider a statement by Publilius Syrus, who said; "**It is a bad plan that admits of no modification**". Be patient, be flexible, and be careful!

Work Planning & Organization: Problems & Solutions

"If the blind lead the blind, both shall fall in the ditch." ~New Testament, Matthew 15:14

One of the standard responses is; "**Do we need a plan?**" The answer should be assessed against current performance of the diecutting operation. Across the industry it is rare to generate greater than a 50% yield from each diecutting press! Therefore, given these are serious problems with productive output, or conversely, there exists a tremendous untapped productive potential, utilizing exist-

The ABC's of Fast Diecutting Press Changeover!



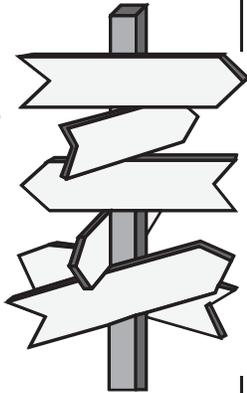
*"In the average ... plant 20 to 25 percent of the cost of goods sold is spent on finding and correcting errors. And many of the workers do not actually produce anything--they just correct mistakes."
--Henry J. Johansson*

ing resources, it is obvious, we need to find more effective methods and practices to increase the Safety, the Speed, and the Quality of output, and to lower the Cost of Manufacturing. Emphatically, we are desperate for an effective work plan, because without one, we struggle daily to meet the increasingly aggressive demands of an impatient marketplace.

So what are some of the problems we need to overcome to develop a Work Planning Solution?

→ *There is an inherent and deep seated resistance to change in the workplace.*

→ *The impact of the planning process will take time to develop and implementation will come slowly, and many in the work team and the management team will become impatient for quick results, and either try to accelerate the project, or in frustration, they will try to kill it!*



→ *Building a Work Planning consensus will be difficult because everyone will have to compromise on something, to enable the best of the best in the planning system.*

→ *Given the tight schedule it will be difficult to consistently gouge out sufficient time for the project. When we are busy there is no time, and when we are slow there is no money!*

→ *One of the chronic problems in diecutting is we do not schedule process improvement as though it were a serious activity, rather we try to compress the activity into odd moments between production activities, which reinforces our lack of commitment to serious improvement.*



→ *One of the complex challenges of Changeover Work Planning, is the planning process inevitably crosses the boundary between many production disciplines. Therefore, while it is difficult to change the diecutting depart-*

ment, it is even more difficult to sell the cooperative effort required of other personnel from other departments.



"Most meetings are held to discuss a given situation or to monitor a task. Seldom do people meet to monitor the process, that is, the way we do the work and how we are working together. Little time is spent in planning, monitoring, and creating the climate of the organization itself."

Kenneth & Linda Schatz

→ *Unfortunately, this is not about building one plan but many plans. Having a rigid plan, which will precisely meet every production job requirement is clearly impossible and unrealistic. Therefore, the Changeover Work Plan will have to be flexible enough to accommodate different types of work, and/or it will require a different plan for each different type of work.*

→ *In practice, improving work planning or changeover preparation is an ongoing process with no logical conclusion ... when do you wish to stop improving? Therefore, it is useful to choose the project team leader carefully, and to anticipate a one to two year assignment.*

There are clearly many issues to address in creating a World Class System of Diecutting Manufacturing, but one of the foundations of an effective organization are those who employ proven methods for precise work planning.



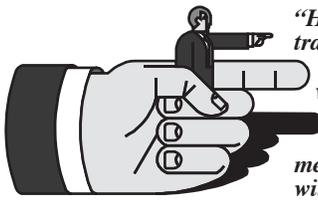
PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

In practice, this entire manual is a Changeover Work Plan, and the planning process is simply determining and organizing the way in which it will be implemented. However, it is sensible to consider all of the potential obstacles to implementation of both the planning process and the program.



*"Problems can be reduced by allowing employees to help plan changes rather than directing them to execute a plan made by others."
Eugene Raudsepp*

The existing system of manufacturing has developed over a period of years, and although it may be outdated, there is a great deal of familiarity



"He who every morning plans the transactions of the day and follows out that plan carries a thread that will guide him through the labyrinth of the most busy life ... If the disposal of time is surrendered merely to the chance of incident, chaos will soon reign." Victor Hugo

and comfort with this approach to manufacturing. Therefore, some of the potential issues facing the planning team are:

→ *As we have learnt earlier in the manual developing consistent behaviors is challenge, however, modifying existing behavior is even more difficult. People hold on to their traditions and it takes time, and many repetitions of the correct behavior to develop new and upgraded habits.*

→ *Inevitably, the development and gradual implementation of an effective plan will expose the significant difference and variation in knowledge, in skill, and in experience between all of the participants.*



→ *It is hardly effective to develop an explicit plan of action, when everyone involved is completing tasks and procedures in a different and inherently variable manner.*

→ *To ensure effective work planning, it will be essential to involve those members of other departments whose actions and decisions impact diecutting changeover performance. It is difficult to sell the concept of allocating time to diecutting, when inevitably there is insufficient time for their own process improvement projects.*

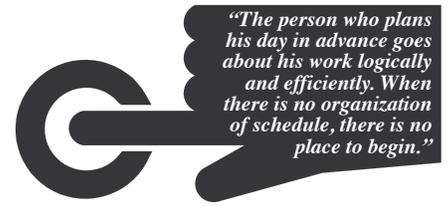
→ *While gaining voluntary and enthusiastic participation of the entire work team in the planning process is essential, someone with the authority to demand compliance must become an integral part of the planning team.*

→ *The preparation and communication of this project to the diecutting work teams, and to the other departments involved will be a difficult*



Do we have a Plan!!!

sell, and it is vital to ensure everyone understands the entire

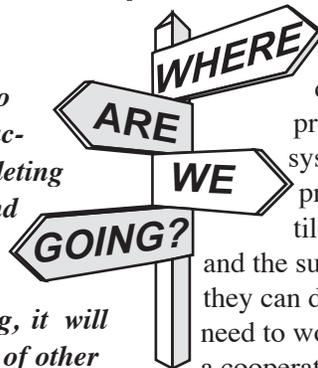


"The person who plans his day in advance goes about his work logically and efficiently. When there is no organization of schedule, there is no place to begin."

weight of the management and ownership team is backing this initiative! This level of intense communication and feedback must be maintained throughout the development and the implementation of the Changeover Work Planning System.

This entire project will require the active participation and the full support of the management team to make it a successful project. It has to be clear to everyone, that this project is moving forward, no matter what!

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...



Unfortunately, most diecutting personnel do not understand the need for an aggressive pre-planning system or a detailed work planning system, and are often silently resistant to the project, or even worse, they are outwardly hostile. Most feel the current system of changeover, and the subsequent performance standards, are the best they can do and they resent any implication that they need to work harder or smarter! It is vital we sell this as a cooperative project, that can only proceed with their full involvement, however, it must be made clear that this is going forward, one way or another.

Some of their concerns are caused by:

- *A poor track record in starting, in finishing and in following through on projects.*
- *The perception that there are more important things to spend the money on, which will yield the same if not better results. These are usually tools, equipment, and technology related.*

→ *There is a history of poor communication, and ineffective cooperation, between the*



"The past cannot be regained, although we can learn from it; the future is not yet ours even though we must plan for it... Time is now. We have only today."

departments and the individuals, who by necessity, must be involved in the process.

TEAMWORK

problems from the very beginning, they will inevitably become the primary cause of failure.

→ *The diecutting work team often has the belief that the management team, underestimates the complexity of diecutting, and as a result, the planning system will be ineffective.*



In assessing the obstacles and the causes of resistance to this project, it is vital to evaluate and plan for the impact of key players. In every diecutting operation there are one or two key individuals whose experience, whose knowl-

edge, and whose years on the job, put them in a highly influential and in an often dominant position in the diecutting operation.



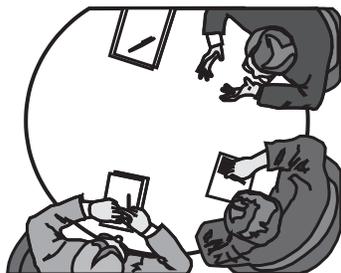
"We must learn to view change as a natural phenomenon -- to anticipate it and plan for it. The future is ours to channel in the direction we want to go ... we must continually ask ourselves, "What will happen if..?" or better still ... "How can we make it happen?"
Lisa Taylor

These "unofficial" leaders can make or break

a process improvement project, and either the task of gaining their cooperation, or a fear of confrontation, often dooms a project before it can begin.

The Changeover Work Planning initiative, and the implementation of many of the disciplines recommended in this manual, require the full cooperation and the involvement of every member of the work team.

Most projects fail because we either ignore this potential challenge, or we fail to realistically deal with the potential problem before the project starts. If we are not willing to resolve these potential



SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

This is a complex project, which is further complicated by the reality we have a system in place, however ineffective. Therefore, to get the Changeover Work Planning initiative underway, and literally to prepare for the implementation of any and all of the disciplines outlined in the manual, we need to consider three (3) key initiatives.

1: Standardize and stabilize current On-Press Activity.

It makes little sense to develop a plan of action and ignore the experience, the knowledge, and the skills we have developed so far. However, the problem with current methods and practices is they vary from individual to individual, and often from make-ready to make-ready with the same individual! The last thing we need is variation in methodology undermining the planning process. By randomly and inconsistently executing key



set-up procedures, any performance measured, and actions taken, would be assessed on a false basis.

The tools required to do this are contained in Section 13, Single Minute Exchange of Die, and specifically the statistical tools outlined on page 183.

The next step is to begin investigating the technical problems and issues which undermine current changeover and production efforts. Therefore, step two is:

2: Implement a Pareto Analysis of on-press issues and problems.

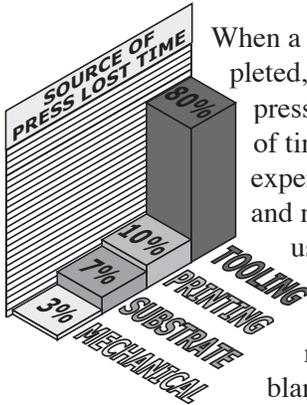
The majority of planning focuses on anticipating problems, which undermine potentially productiv-



"The best we can do is size up the chances, calculate the risks involved, estimate our ability to deal with them, and then make our plans with confidence." Henry Ford

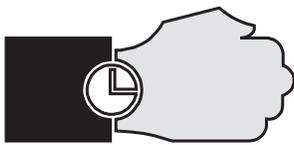
ity and quality, therefore, the sooner we can begin to gain an accurate picture of what is happening, we can begin to change the methods and practices used to prepare for press changeover.

The tools required to do this are contained in Section 11, Systems of Measurement, and specifically the Key Result Analysis statistical tools outlined on pages 152-156.



When a statistical analysis are completed, of press changeover, and press production, the vast majority of time, (lost productive time), is expended in making adjustments and modifications to all of the tools used in diecutting. These would include the steel rule die, the fiber glass counters, and the male and female stripping and blanking tools.

It should also be obvious that the press team has little or no control over the design and the specification of the tools, however, they have to deal with the performance of the tools on-press. Therefore, it is important to revise the Design, the Specification and the Fabrication of tools

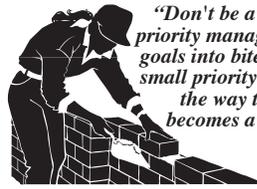
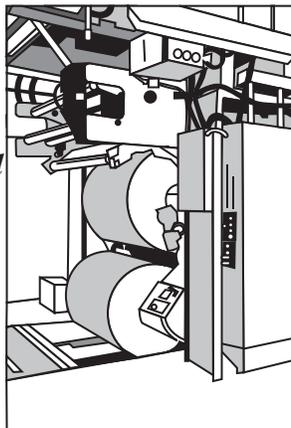


to make sure the parameters chosen are the most effective for efficient converting. Therefore, the third step of the four disciplines is:

3: In conjunction with the CAD-CAM, and Diemaking/Toolmaking Teams, develop/ upgrade the Specification, the Design and the Fabrication of the Converting Tools.

The tools required to do this are contained in Section 17, Diemaking & Toolmaking Organization, and specifically the recommendations outlined in the SOLUTION on pages 226-228.

Through the implementation of these disciplines we can find out what is currently happening in press set-up, and begin to forge



"Don't be a time manager, be a priority manager. Cut your major goals into bite-sized pieces. Each small priority or requirement, on the way to the ultimate goal, becomes a mini goal in itself."
Denis Waitley

the best-of-the-best practices; through the implementation of a statistical Key Result Analysis, we can identify, quantify

and attack specific technical problems in tool preparation; and finally by starting the development of a Specification System for all of the tools used in diecutting, we can begin to develop more effective design and fabrication procedures, to eliminate the high percentage of Changeover and Production down time caused by ineffective tool performance.

Naturally, these actions do not happen in a vacuum, therefore, we need to consider the following steps as part of the Changeover Work Planning project:

- ➔ **Select and appoint a Team Leader for the project.**
- ➔ **Form a Work Planning Project Team, and include representatives of all of the departments impacting on-press performance.**
- ➔ **Invest in a Coach-Facilitator for the project.**
- ➔ **Get everyone together who are involved in diecutting, either directly or indirectly, define, discuss, brainstorm, and develop a consensus support for the project.**
- ➔ **Describe the three initial project steps, and select the team members who will be involved in the implementation.**
- ➔ **Schedule a series of information and discussion or meetings with the teams to keep everyone involved and up-to-date.**
- ➔ **Get started, time is of the essence!**



This is the most important project in the manual, as everything must revolve around an effective

DIECUTTING PLANNING



The ABC's of Fast Diecutting Press Changeover!

planning and preparatory system. And a system in which the entire team has a real sense of ownership

INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

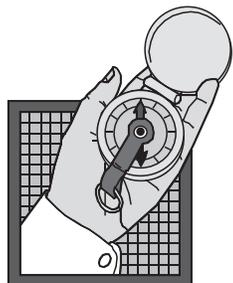
The development and the implementation of any process improvement initiative is designed to increase speed, to improve quality, and/or to improve performance. Unfortunately, the majority of projects initially slow things down as the work teams learn new ways to do things, and they carefully review and check each step in the process.



As most organizations are already fighting a losing battle against tough deadlines, implementing the project across the board would maximize disruption and lost time. Therefore, the logical innovation we recommend is to develop and implement this project on a single press.

This approach will limit the scope of the project without compromising the validity of the process improvement initiative. Most presses run two shifts, therefore, the learning cycle is confined to two press crews, and support personnel. This is easier to manage, easier to control, the feedback is immediate, and progress is usually faster and more effective.

As the Changeover Work Plan is developed and each stage implemented, measured, revised, upgraded, and approved, the standard operating procedure can be taught to the other press crews, and the project implemented incrementally. Alternatively, the decision could be to wait until the project is complete, and then implement the conversion of the other presses and the entire department.

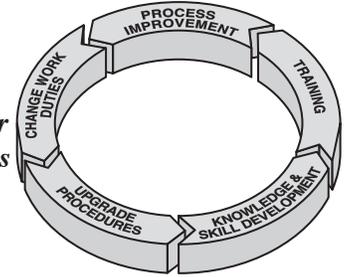


A further refinement is to start with one press, then convert the second and the third, in a gradual program of process improvement. These are all decisions to be made based upon the type of equipment, the nature of

work, the operating structure, the caliber of the team and the team leaders in place.

The Goals of Work Planning & Organization:

“Nothing is impossible; there are ways that lead to everything, and if we have sufficient will we should always have sufficient means. It is often merely for an excuse that we say things are impossible.” ~Francois de La Rochefoucauld



The primary focus of the ABC Manual is to provide the user with the tools and the techniques to transform the current slow and inconsistent press make-ready activity into a fast, an efficient, and a consistently and professionally executed changeover sequence. It is obviously critical to move away from an erratic and a randomly executed series of unproven procedures to a high speed, precisely choreographed, and consistently executed discipline. To accomplish this we have to develop, implement and constantly tune and upgrade, a written plan of action.

The goals of work planning are:

➔ *To standardize and to stabilize the current changeover process.*

➔ *To capture and define all of the organizational, procedural, and technical issues, which currently undermine productive performance.*

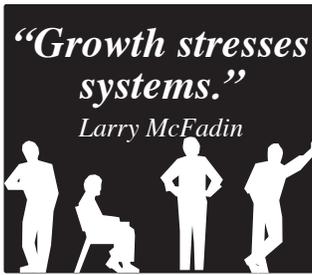
➔ *To convince everyone involved of the important concept and practice of combining all of the best ideas of the entire team into a consensus driven plan of action.*

➔ *To build a cooperative focus on fast press changeover, amongst the many different disciplines who are involved with and impact on-press performance.*

➔ *To use this process to level the knowledge, the skill and the experi-*

HELP





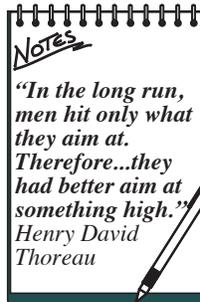
ence playing field. → To develop a series of modular, standardized changeover work plans, enable each variation of converting job to be processed efficiently.

→ To get everyone to use an identical approach to changeover planning and execution, and to accelerate the development of each standardized plan through the pooling of solutions, of ideas, and of suggestions.

→ To stabilize and steadily improve diecutting performance through the disciplines of team building and team work.

→ To create the fastest systematic approach to high speed press changeover.

If we follow the plan, if we have the discipline and the courage to persevere, there is absolutely no reason these goals will be converted into practical reality.



Work Planning & Organization: Methods & Practices

'Speed has become an important element of strategy.' ~Regis McKenna

The most important attribute we require to develop an effective changeover work planning system is an unyielding determination to succeed. This is not a difficult task, but it is a complex project. This is not a short term fix, but it is a long term solution. This will not be easy to control, but it is a manageable situation.

It is not simply we are asking people to change, but the reality is we have to change everything. And while people are always willing to initially endorse a productive vision, they start to lose enthusiasm, as the details of the changes impact their work. The Project Leader will need the support of everyone to stay on track, and to keep the project alive! The initial phase of the plan is simple and straightforward.

Working on a single diecutting press we must:



1: Standardize Current Methods & Procedures.

2: Precisely identify, categorize, and prioritize the problems undermining on-press performance.

3: Upgrade the specification, the design and the fabrication of tools.

If we start from number three, we know from numerous statistical assessments of changeover, that the majority of time is expended in adjusting and modifying tools to optimize converting performance. (To make the transition from make-ready to production.) In addition, we know from existing statistical studies of press production, that the majority of press down time, more than 80%, is associated with tool adjustment and modification.

Therefore, the primary focus of the first part of the plan is to discover the technical weaknesses in toolmaking and correct them. However, as this will only be effective when everything is standardized and stabilized, operators, diemakers, and pre-press personnel, doing things in a consistent manner, step one is clearly the correct starting point.



An appropriate quotation illustrates the challenge: 'He who wishes to fulfill his mission in the world must be a man of one idea, one great overmastering purpose, overshadowing all his aims, and guiding and controlling his entire life.'

Work Planning & Organization: The Benefits of Change

'Good results without good planning come from good luck, not good management.' ~David Jaquith

Can you imagine the impact of performance if the NASCAR Pit Crew Team for a famous driver, jumped over the wall when the car entered the pit, with different people each time; with variable skill levels; with the wrong sized tires; with an incomplete set of tools; and with no practiced method of operation. It would obviously be a disaster.

What makes Pit Crew Changeover so effective, is they are using the best operating procedures they know how; every tool, material, and part is in



The ABC's of Fast Diecutting Press Changeover!

optimal condition, and in the same location it is every time; every action is meticulously choreographed and precisely coordinated; they are all relentlessly trained and performance certified; they constantly practice and improve; and their performance is carefully timed, measured and evaluated, against competitive benchmark standards.

How does this picture compare with each press changeover in your operation?

If we are to improve diecutting performance, this is the model we need to adopt. While we are unlikely to turn a press around in less than 20 seconds, imagine the impact on press changeover, if we only integrated some of the disciplines, that make the Pit Crew so successful.

The benefits of changing the current system of manufacturing by developing a plan of action, to adopt many of the principles of the Pit Crew discipline and the organizational

focus of the Hospital Emergency Room, will revolutionize performance in diecutting. But we need a plan!

Work Planning & Organization: Recommended Actions

"Every moment spent planning saves three to four in execution." ~Crawford Greenwalt

The key actions in creating an effective Changeover Work Plan include:

- ➔ ***Select a team leader with the abilities, the stamina and the character to see the project through to completion.***
- ➔ ***Choose the Project Team with the same degree of care, and ensure it has representatives from related disciplines, which will need to change to develop a new system of diecutting manufacturing.***

- ➔ ***Provide unequivocal support for the team leader, the team and the project, from upper management and the ownership, and***



"If you are planning for a year, sow rice; if you are planning for a decade, plant trees; if you are planning for a lifetime, educate people."
Chinese Proverb

take every opportunity to publicly endorse the team and the project.

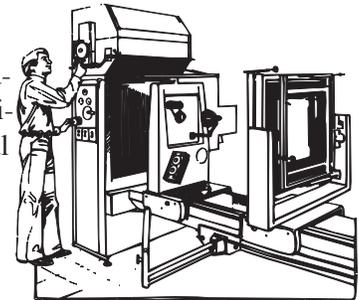
➔ ***Develop a realistic budget for the project, and provide the funds to ensure there are no unreasonable financial constraints on making progress.***

➔ ***Using frequent information meetings, brainstorming sessions, progress bulletins, and any other gathering in the company, to keep everyone up-to-date and involved in this project.***

➔ ***Take every opportunity to recognize and reward the people involved in the project, and enthusiastically celebrate each step forward with the entire organization.***

This project represents both the greatest opportunity for progressive change, and it represents the greatest challenge to the talent, the abilities, and the determination of the entire work force.

In essence this project is designed to move the operation from a craft based, individually focused, traditional method of converting, to a high speed, team driven, systematic approach to manufacturing.



This is not an easy task, even though each of the steps and the technical changes are relatively simple. We are asking people to change, to work together as a team, and to work for each other, for a more secure future.

This quote from Robert Moorehead defines the challenge for the Project Team Leader: "My face is set, my gait is fast, my goal is heaven, my road is narrow, my way is rough, my companions are few, my guide is reliable, my mission is clear. I cannot be bought, compromised, detoured, lured away, turned back, diluted, or delayed. I will not flinch in the face of sacrifice, hesitate in the presence of adversity, negotiate ... at the table of the enemy, ponder at the pool of popularity, or meander in a maze of mediocrity. I won't give up, shut up, let up, or slow up."



Section Twenty Three: Work Planning & Organization: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ Every single recommendation and every productive action, specified in this manual, requires precise, detailed pre-planning, meticulous organization and checklist preparation. This is the most important recommendation in the manual, **because nothing will go to plan, if you don't have a plan!**
- ✓ To a large extent, the planning or re-planning process will be dictated by which of the disciplines and the priority of the disciplines, the planning development team determines to implement. For example, System Maintenance, or Single Minute Exchange of Die, or Just-in-Time Manufacturing, require many things to be determined, many things to be organized, and many things to be put in place, before they can **begin** to be properly implemented.
- ✓ Implementing a Changeover Work Plan is not an insignificant activity and it represents a major change to current methods and practices, and it represents a major upheaval for all the people involved. Therefore, it is important to be patient, to use a slow and a steady approach, and to make sure everyone involved or impacted by the change is given sufficient time to adjust and to get comfortable and familiar with the changes.
- ✓ Unfortunately, most diecutting personnel do not understand the need for an aggressive pre-planning system or a detailed work planning system, and are often silently resistant to the project, or even worse, they are outwardly hostile. Most feel the current system of changeover, and the subsequent performance standards, are the best they can do and they resent any implication that they need to work harder or smarter! It is vital we sell this as a cooperative project, that can only proceed with their full involvement, however, it must be made clear that this is going forward, one way or another.
- ✓ In assessing the obstacles and the causes of resistance to this project, it is vital to evaluate and plan for the impact of key players. In every diecutting operation there are one or two key individuals whose experience, whose knowledge, and whose years on the job, put them in a highly influential and in an often dominant position in the diecutting

operation. These “**unofficial**” leaders can make or break a process improvement project, and either the task of gaining their cooperation, or a fear of confrontation, often dooms a project before it can begin.

- ✓ It makes little sense to develop a plan of action and ignore the experience, the knowledge, and the skills we have developed so far. However, the problem with current methods and practices is they vary from individual to individual, and often from make-ready to make-ready with the same individual! The last thing we need is variation in methodology undermining the planning process. By randomly and inconsistently executing key set-up procedures, any performance measured, and actions taken would be assessed on a false basis.
- ✓ When a statistical analysis is completed of press changeover, and press production, the vast majority of time is lost productive time, is expended in making adjustments and modifications to all of the tools used in diecutting. These would include the steel rule die, the fiber glass counters, and the male and female stripping and blanking tools.

It should also be obvious that the press team has little or no control over the design and the specification of the tools, however, they have to deal with the performance of the tools on-press. Therefore, it is important to revise the Design, the Specification and the Fabrication of tools to make sure the parameters chosen are the most effective for efficient converting.

- ✓ Through the implementation of Standardization of Press Set-up, we can find out what is currently happening in press set-up, and begin to forge the best-of-the-best practices; through the implementation of a statistical Key Result Analysis, we can identify, quantify and attack specific technical problems in tool preparation; and finally by starting the development of a Specification System for all of the tools used in diecutting, we can begin to develop more effective design and fabrication procedures, to eliminate the high percentage of Changeover and Production down time caused by ineffective tool performance.

Section Twenty Three:

Work Planning & Organization: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Do you have a written and team approved Changeover Work Plan?
- ✓ How would you describe the advantages and disadvantages of this type of approach to improving press changeover performance.
- ✓ How do you feel the diecutting department personnel will react to this type of initiative?
- ✓ Describe the preparatory steps you currently use to prepare for press changeover?
- ✓ How do you think your colleagues will react to the idea of pooling all of their knowledge and experience, to generate a consensus changeover work plan?
- ✓ How does the diecutting department currently plan for, schedule, and execute process improvement programs?
- ✓ Does the diecutting team have a positive, and cooperative relationship with other disciplines in the converting process, and how are you working with these teams to improve press changeover performance?
- ✓ If a survey of press set-up was conducted throughout the department, would there be differences in the sequence of activity, and the methods and practices used?
- ✓ The recommendation is to start with standardizing and stabilizing press set-up, but as your team will have a choice, how would you initially focus the efforts of the project team?
- ✓ Do you have confidence that your organization is totally committed to process improvement, and is willing to take all of the necessary steps to complete this planning project?
- ✓ How does the diecutting department currently research and investigate press set-up and production lost time problems, and is it effective?
- ✓ How do you see the work teams transforming on-press organization, using the techniques developed in Hospital Emergency Rooms?
- ✓ Can you see the department accepting, developing, and perfecting the skills of NASCAR like Pit Crew Press Changeover?
- ✓ How would you describe the potential problems and barriers to team building and to team work in diecutting?
- ✓ Who do you feel is the best candidate to lead the Changeover Work Planning Project?
- ✓ Would you be willing to become one of the Planning Project Team Members?

Manufacturing System of Organization

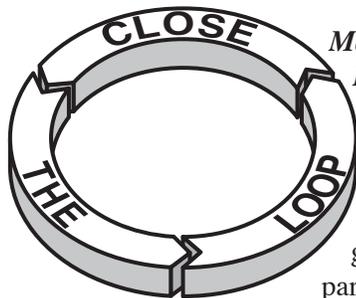
Section 24: Closing-the-Loop

Key Definitions: ... an analysis carried out shortly after the conclusion of an event, especially an unsuccessful one ... a formal discussion of an event after it has happened, especially of what was wrong with it or why it failed ... an analysis or evaluation of something after it has ended ... an analysis or evaluation of an activity or a procedure or a process.

The Closing-the-Loop Mission Statement: "It is the mission of the work team to develop a simple, a fast and an effective close-out questionnaire, applied at the end of an activity, such as press changeover, to determine what knowledge was gained, what problems were encountered, what solutions were developed, & how the process can be changed for the next production cycle."

Closing-the-Loop: An Overview

"Good judgment comes from experience. Experience comes from bad judgment." ~Jim Horning



Manufacturing is about Research. And while our primary goal will always be to achieve and to sustain a high level of productive output, and to generate consistent diecut part quality, our secondary goal is **Education!** The harsh reality is, every single production cycle reveals new information, it presents new problems, it shows new ways to do things, and it generates new solutions and new ideas. However, if we ignore this bounty, or we are not set-up to collect problems or solutions, we are condemned to struggle in the future as we individually and collectively, repeat the same mistakes, with the same results.

Our future and our security depend upon how much we can learn from each production cycle, how effectively we consolidate and share the information with the entire team, and how quickly we can upgrade existing practices and procedures.

For example, if we have ten technicians, our diecutting operation has a Research Team of ten people. If each one of this team observe just one aspect of the diecutting process; and collect, record and share their experience with all of their colleagues, the entire team rapidly advances in knowledge, in skill, and in competitive ability.

Our mission is always simple. We have to do it **Faster, Better, and at a Lower Cost**, and the tool we need to accomplish this

"Problems can become opportunities when the right people come together."

Robert Redford



is to conclude each production cycle by asking: **What worked well...what worked badly...and,**

what do can we change for the next production cycle, to solve the problem or to improve the process?

"Greatness, in the last analysis, is largely bravery---courage in escaping from old ideas and old standards." James Harvey

problem or to improve the process?

The greater the number of technicians focusing on key attributes of the process, the more we maximize our research and education capability, the greater the speed of progress and the faster we improve performance standards.

We have to change, we have to go faster, we have to find solutions to issues which undermine productive output, therefore with ten people conducting tests and experiments, our "research" team will generate a steady flow of productive solutions, better ways to do things, and faster methods of processing.

Closing-the-Loop: Problems & Solutions

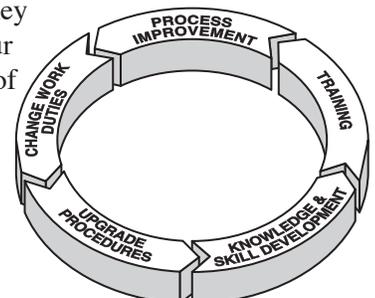
"Happy is he who has been able to learn the causes of things. (Felix qui potuit rerum cognoscere causas)"

~Virgil 70-19 BC

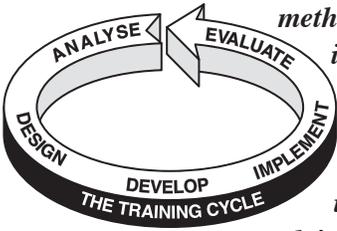
We learn from experience, and if you have ten people who are constantly experiencing the same obstacles, the same problems and the same frustrations, why would any organization ignore this powerful resources?

So what are some of the key problems, that result in our failure to take advantage of this remedial resource?

→ The lack of standardization, and consistently in key



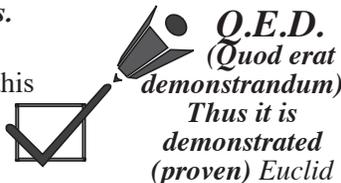
The ABC's of Fast Diecutting Press Changeover!



methods and practices, makes it very difficult to gather solutions, to compare to an existing benchmark, and then to share with a team, in which every individual is doing things differently.

- The lack of teamwork and a cooperative focus on these issues means there is no concerted effort to identify, to categorize, and document problems, which is the first step to collectively identifying a solution or an alternative strategy.
- The failure to develop a work planning system for each category of work, and a failure to logically follow-up by asking what did we learn, how does the experience change the way we would do things next time, and how do we measure and evaluate the new approach?
- A failure to bring together the key players from each department, which impact on-press performance, severely limits the ability to focus on a specific problem, to organize an alternative approach, and to make the right decisions early enough in the preparatory process.

There is no great mystery to this process, it is literally how the world turns, and how each generation builds upon the mistakes and the innovation of earlier generations. Our cycle is obviously much shorter, but the same principles apply.



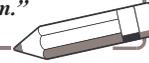
PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

The main problem is a failure to understand how process improvement is organized, managed and driven in manufacturing. What are the key issues?

- There is no work planning.
- There is no teamwork.
- There is no standardization.

- There is no benchmarking.
- There is no training system.
- There is no postmortem evaluation.
- There is no way we can succeed like this!

"Most people spend more time and energy going around problems than in trying to solve them."
Henry Ford



Every company is struggling to find the fastest, the best, the simplest

and the least costly methods and practices, to generate a high performance, diecutting system of manufacturing. Without a serious effort to integrate these disciplines, the problem of poor performance and painfully slow process improvement will continue.

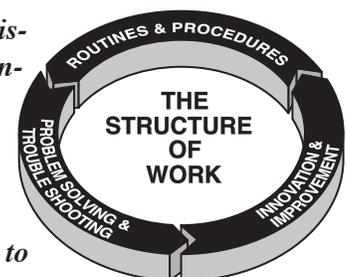
CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

The obvious conclusion to be drawn from our inaction, is we do not recognize that the diecutting-manufacturing process is all about value-added research. Given this strange myopia, it is obviously difficult to plan and to prepare, and to implement and evaluate specific tests, when there is no practice in applying these key disciplines.

So what is the cause of this inertia?

- An inability to organize as a cohesive, cooperative team, combined with a failure to allocate sufficient time and resources for team building and for teamwork practice.
- With no effective team structure in place there is minimal opportunity to communicate and to collaborate, and to develop a consensus action program.

- Compounding these issues, the lack of a standardized approach to key procedures does not preclude process improvement, but it makes it very difficult to





improve a procedure, which is executed differently from one individual to the next.

→ With this fractured operating structure it is difficult to find time to focus on education, on research, on learning, and on a determined effort to solve perennial problems.

→ Finally, the drive for process improvement is all about speed, throughput, and turnaround. A failure to standardize eliminates effective benchmarking, and it makes it impossible to measure and assess performance against an agreed standard.

There are many related causes making it difficult to generate and to manage process improvement. And without a significant change in the diecutting operating structure, the struggle will continue!

SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

Clearly the solution to this problem, would be to build an effective system of diecutting manufacturing. This would obviously require solving the problems specified earlier.

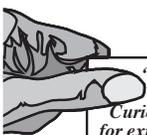
This requires developing and implementing:

- A Work Planning System.
- A Teambuilding Discipline.
- The Standardization of Key Procedures.
- The Benchmarking of Key Procedures.

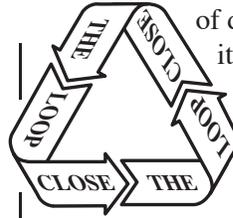
→ Training System.

→ A Close-Out-System.

This entire manual clearly advocates a planned and a measured, step-by-step, building block approach to creating an effective system



"The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when you contemplate the mysteries of eternity, of life, of the marvelous structure of reality. It is enough if one tries merely to comprehend a little of this mystery every day. Never lose a holy curiosity."
Albert Einstein



of diecutting manufacturing. Therefore, yes, it would be most effective to follow the recommendations and develop or upgrade current methods and practices, one step and one discipline at a time.

However, there is such an enormous benefit to be gained by starting the information collection procedure as soon as possible, the close-out discipline should be implemented immediately. This enables everyone to get involved in process improvement, in sharing, in leveling the knowledge and skill playing field, and in making the diecutting process faster, simpler, and less complex.

So how do we start?

The answer is to conclude each press changeover sequence with a short five minute close-out or discussion, in which problems are problems, and obstacles are identified, issues and constraints are specified, and solutions, suggestions and innovations collected.

The basic questions have been reiterated many times throughout the manual:



- What worked well?
- What worked poorly?
- What do we need to change for the next time?

It is obviously a discipline which can be augmented, and made more specific by asking:

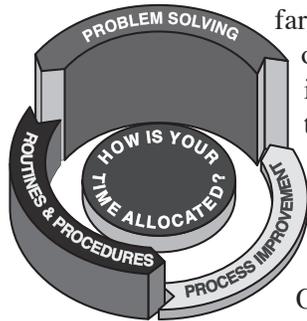
→ What were the top three problems you faced?

It is also important to note, that if we make the close-out too complex, it will consume time, it will frustrate the operator, and it will fail. Therefore, keep the questions simple, and make it as easy as possible for everyone to participate.

In developing this system it is always more effective if the operator is not required to write things down or to fill out a specific form. Although everyone should be willing to participate it is



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far more effective if the lead man or the supervisor conducts an interview of the operator and the changeover team, at the conclusion of the make-ready, and asks and records the basic questions and answers.

Often there will be more than one person involved in a press make-ready, and it is useful to ask each person a simple question:

→ *Tell me one thing you learnt from this experience?*

Every single person I have asked this question of responds with an idea, a solution or a suggestion to improve the process. Just imagine the impact of all of these ideas collected, after all of the changeovers, on all of the presses, over the last year!

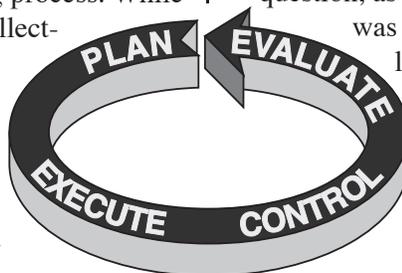
It is obviously important to develop a mechanism to record and to post the results of each close-out, to categorise and to prioritize the information, and to develop a definitive action list.

WARNING - if you are not prepared to plan and to schedule action on the data you receive from this initiative, in a reasonable time frame, do not start! People will get involved and stay involved when they see things happening. But if there is no action, not only did you waste time, the next initiative will be greeted with skepticism and resistance.

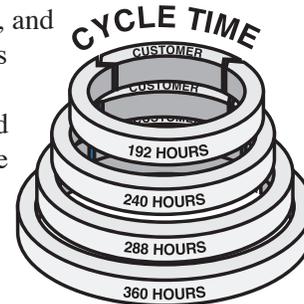
INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

Unfortunately, it is not uncommon to process an order which experiences multiple production problems, and/or encounters a serious quality or productivity breakdown, in one or more parts of the manufacturing process. While the close-out discipline is effective for collecting process improvement data, the scale of a major breakdown requires a more in-depth and a more formal analysis.

The solution is to implement a *Process Postmortem Analysis*, which represents a



more measured, a more urgent, and a more comprehensive analysis of a specific process failure. In practice, this form of organized attack on a problem or a failure should be an integral part of the operating structure.



To organize this discipline requires organizing the following:

→ *Appoint a Process Postmortem Team Leader.*

→ *Form a Process Postmortem Team.*

→ *Select the Team Representatives from:*

- ✓ Administration/Management
- ✓ Planning & Scheduling
- ✓ Structural Design - CAD-CAM
- ✓ Printing & Graphic Services
- ✓ Diemaking - Toolmaking
- ✓ Pre-Press
- ✓ Diecutting
- ✓ Quality Management



"If I were to prescribe one process in the training of men, which is fundamental to success in any direction, it would be thorough ongoing training in the habit of accurate observation. It is a habit which every one of us should be seeking ever more to perfect." Eugene G. Grace

There are two approaches to this form of detailed analytical in-

vestigation. The first, is obviously in response to a serious job/order crisis, where answers are required as a matter of urgency.

The second, is to Red Flag one job per month, based upon complexity, history or because the order represents a critical challenge to the organization.

In the first instance, where we are responding to a process failure, each of the Process Postmortem Team members will be given a specific time to investigate, to analyze, and to document, what happened to the specific job in question, as it entered their specific department, as it was processed, and as it was passed down the line to the next process.

With all of the information collected, the team should meet to discuss, to brainstorm, and to determine what changes need to be made and what actions need to



be taken.

The second instance, where the postmortem analytical process is pre-determined, the analytical process remains the same, however, the degree of urgency is certainly less. The reason this is a good practice, apart from the benefit of evaluating an order in detail, is it gives the team time to develop and to practice as a analytical team, so they are prepared for a major crisis.

Every company needs to implement some form of *Crisis & Contingency Planning* into the operating structure, so they are able to respond to a crisis in a professional and an effective manner.

The Goals of Closing-the-Loop:

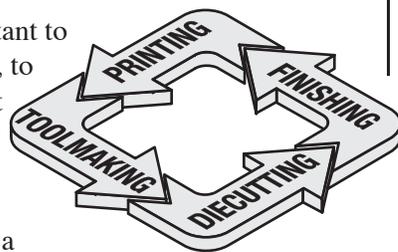
“(“Pareto’s Optimum,” also known as the 20/80 Rule:) Twenty percent of the participants are responsible for eighty percent of the activity.” ~Vilfredo Pareto

One of the more complex challenges in high speed manufacturing is when are faced with a problem, to be able to gouge sufficient time from the schedule to evaluate the cause of the problem, and to determine how to change methods and practices for subsequent cycles. The dynamic of diecutting converting is we are always racing against the clock to meet increasingly aggressive deadlines, therefore, we face and solve problems on the fly, and get back into production immediately.

There is often so much happening, that when time is available to analyze the issue, so much time has passed, and so many similar problems have occurred, that it is difficult for those involved to remember the problem, let alone the solution.

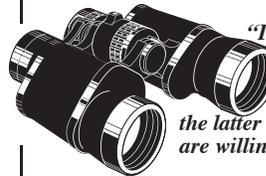
The idea of Closing-the-Loop is to ask and answer the key questions as close to the event as possible. If the three key questions are asked, immediately at the conclusion of the changeover cycle, then the chance of accurate answers and detailed recall is more likely than if the questions were delayed by hours or even days.

That is why it is so important to keep the questions simple, to take the minimum amount of time, and to become part of the solution rather than part of the problem. If we have the services of a



changeover team.

Make-ready is about details, and while each problem may not be severe, each delay of only seconds or a few minutes, and each obstacle or each minor constraint adds to activity time, and the time for press changeover incrementally and almost invisibly grows! The press teams have often institutionalized the problems, and poorly separate the accumulated non-value added lost time from the necessary value-added activity time. That is why reducing changeover time is so difficult, because it is a



“It is easier to perceive error than to find truth, for the former lies on the surface and is easily seen, while the latter lies in the depth, where few are willing to search for it.” Goethe

struggle to get the press teams to understand the impact of the accumulation of seconds

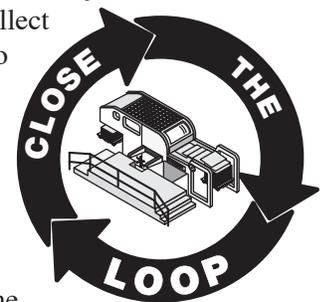
and minutes, and to recognize these technical or organization problems can be and should be eliminated.

The goals of the Close-the-Loop discipline, is to provide an immediate evaluation of these issues and to capture the relevant information about problems, solutions, and innovation, as close to the activity as possible.

Closing-the-Loop: Methods & Practices

“Analysis is not a scientific procedure for reaching decisions which avoid intuitive elements, but rather a mechanism for sharpening the intuition of the decision maker.” ~James R. Schlesinger

It is important to recognize, that the closing-the-loop discipline is not intended to solve the problem on the spot, rather it is designed to collect information about problems, so that the problem can be dissected by the press team at a later date. Certainly, many problems are solved, but even then, the goal of closing-the-loop is to capture solutions, to share with other members of the



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press teams, and to integrate the solutions into changed procedures, which everyone can benefit from.

Closing-the-Loop is designed to be an informal procedure, and to collect information, issues, and solutions in a manner, which does not become another layer in a bureaucratic nightmare. Much like a consultant, the person asking the questions, should have the ability to read between the lines, and to probe for details, without being unnecessarily intrusive. This is a simple discipline, but the benefits are significant.

Closing-the-Loop: The Benefits of Change
"It is easier to perceive error than to find truth, for the former lies on the surface and is easily seen, while the latter lies in the depth, where few are willing to search for it." ~Johann Wolfgang von Goethe

One of the great benefits of closing-the-loop is it is so easy to organize. You can start tomorrow, and you will gain benefits and advantages immediately.

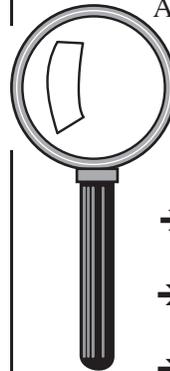
It is an excellent way to kick start the Changeover Improvement Initiative because the participants simply have to answer three questions, it demonstrates to them we respect their opinions and their ideas, and it gets everyone talking and involved.

The primary goal is to improve the process, however, the secondary goal is to level the knowledge and experience playing field. It will gradually provide everyone with the most effective solutions, the best ways to do things, and the simplest way to get the job done.

To gain the benefits, get started, now!

Closing-the-Loop: Recommended Actions
"If I were to prescribe one process in the training of men which is fundamental to success in any direction, it would be thorough ongoing training in the habit of accurate observation. It is a habit which every one of us should be seeking ever more to perfect."
~Eugene G. Grace

Closing-the-Loop is simple to implement, but powerful in improving the process. However, although it requires asking a number of basic questions, someone has to ask the questions,



record the answers, and collect background data; the information has to be evaluated and processed; a team of qualified personnel has to process the information, and determine what changes are needed; someone has to organize, communicate, implement and monitor the changes; and someone has to keep the entire department up-to-date with the project and the information collected.

As with seemingly simple techniques, there is a great deal which must be done to make the initial effort productive. Therefore, to organize this discipline requires organizing the following:

→ ***Appoint a Team Leader.***

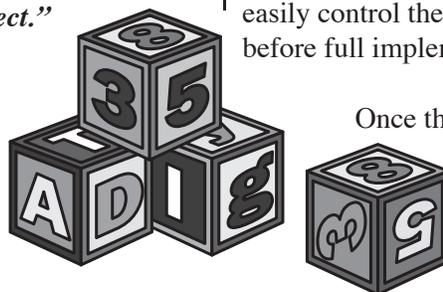
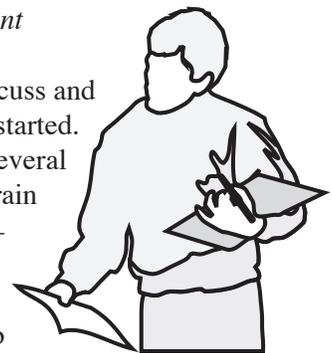
→ ***Form a Team.***

→ ***Select the Team Representatives from:***

- ✓ *Administration/Management*
- ✓ *Planning & Scheduling*
- ✓ *Structural Design - CAD-CAM*
- ✓ *Printing & Graphic Services*
- ✓ *Diemaking - Toolmaking*
- ✓ *Pre-Press*
- ✓ *Diecutting*
- ✓ *Quality Management*

The team can brainstorm, discuss and organize the project, and get started. However, as we have noted several times in the manual, to constrain the potential scale of the project, it would be more effective to select one-press to implement, to practice, and to perfect the close-out discipline.

This will obviously apply to the press team, on that press, from all working shifts. By starting small we can more easily control the discipline and iron out any problems before full implementation.



Once the close-the-loop discipline is proven and perfected, then the discipline can be expanded throughout the department, with minimal problems.

Section Twenty Four: **Closing-the-Loop: Summary**

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ **Manufacturing is about Research.** And while our primary goal will always be to achieve and to sustain a high level of productive output and to generate consistent diecut part quality, our secondary goal is **Education!**
- ✓ The harsh reality is, every single production cycle reveals new information, it presents new problems, it shows new ways to do things, and it generates new solutions and new ideas. However, if we ignore this bounty or we are not set-up to collect problems or solutions, we are condemned to struggle in the future as we individually and collectively repeat the same mistakes with the same results.
- ✓ Our future and our security depend upon how much we can learn from each production cycle, how effectively we consolidate and share the information with the entire team, and how quickly we can upgrade existing practices and procedures.
- ✓ For example, if we have ten technicians our diecutting operation has a Research Team of ten people. If each one of this team observe just one aspect of the diecutting process; and collect, record and share their experience with all of their colleagues, the entire team rapidly advances in knowledge, in skill, and in competitive ability.
- ✓ Our mission is always simple. We have to do it **Faster, Better, and at a Lower Cost**, and the tools we need to accomplish this, is to conclude each production cycle by asking; **What worked well... what worked badly...and, what do we or can we change for the next production cycle, to solve the problem or to improve the process?**
- ✓ Every company is struggling to find the fastest, the best, the simplest and the least costly methods and practices, to generate a high performance, diecutting system of manufacturing. Without a serious effort to integrate these disciplines, the problem of poor performance and painfully slow process improvement will continue.
- ✓ So how do we begin to attack this problem?
- ✓ The answer, is to conclude each press changeover sequence with a short five minute close-out or discussion, in which problems are problems, and obstacles are identified, issues and constraints are specified, and solutions, suggestions and innovations collected.
- ✓ The basic questions have been reiterated many times throughout the manual:
 - ➔ **What worked well?**
 - ➔ **What worked poorly?**
 - ➔ **What do we need to change for the next time?**
- ✓ It is obviously a discipline which can be augmented, and made more specific by asking:
 - ➔ **What were the top three problems you faced?**
- ✓ It is also important to note, that if we make the close-out too complex, it will consume time, it will frustrate the operator, and it will fail. Therefore, keep the questions simple, and make it as easy as possible for everyone to participate.
- ✓ The idea of Closing-the-Loop is to ask and answer the key questions as close to the event as possible. If the three key questions are asked, immediately at the conclusion of the changeover cycle, then the chance of accurate answers and detailed recall is more likely than if the questions were delayed by hours or even days.
- ✓ That is why it is so important to keep the questions simple, to take the minimum amount of time, and to become part of the solution rather than part of the problem.

Section Twenty Four: Closing-the-Loop: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Why do we define manufacturing as a research and testing process, and do you agree with this assessment?
 - ✓ Why do we state, our secondary goal in manufacturing is education?
 - ✓ What are the three key questions asked in Closing-the-Loop?
 - ✓ How do you feel your colleagues and your organization will react to the introduction of Closing-the-Loop?
 - ✓ Name some of the key problems, that result in our failure to take advantage of this simple remedial technique?
 - ✓ How would you explain the importance of completing a research and learning cycle, from every production order?
 - ✓ How do your colleagues and your organization collect problems and share solutions?
 - ✓ Name and explain three of the key problems, which can inhibit the implementation of the Closing-the-Loop discipline?
 - ✓ How would you explain the reluctance of diecutting companies to adopt closing-the-loop, or a similar discipline?
 - ✓ Why is teamwork and team building so important to implementing closing-the-loop?
- ✓ Why is it important to implement a Work Planning System for key activities in diecutting?
 - ✓ Why is standardization important in the long term development of process improvement?
 - ✓ Why is benchmarking and process measurement important in the long term development of process improvement?
 - ✓ Why is developing a Training System important in the long term development of process improvement?
 - ✓ Why is it vital to only start this type of project, if the management team is determined to follow through with process improvement and training?
 - ✓ What is the Process Postmortem Team?
 - ✓ Who should be involved in the Process Postmortem Team?
 - ✓ How is the Process Postmortem Analysis, designed to work?
 - ✓ There are two ways to select jobs for Postmortem Analysis, what are they?
 - ✓ What is the reason and the benefit of Red Flagging specific jobs?
 - ✓ What would be the advantage of adding a Coach or a Facilitator to implementing the Closing-the-Loop discipline?

Manufacturing System of Organization

Section 25: The Program: A Plan of Action

Key Definitions: ... **A Plan of Action** ... to devise a plan or to project the realization or achievement of a specific sequence of measurable, performance milestones ... to have and to communicate in writing a specified intention or a course of action ... the act of formulating a program for a definite course of action ... the act or process of making a plan or plans.

The Plan of Action Mission Statement: "It is the mission of the project team to develop an inclusive plan of action; which utilizes team building, teamwork & team member unity, as the operating structure for integrating all of the best ideas, the best methods and the best practices, into a cohesive program for building an World Class diecutting system of manufacturing."

The Program: A Plan of Action: An Overview

"Things which come to us easily have no significance. The satisfaction we get in life comes when we do something which is difficult; when there is sacrifice involved." ~Barr

This is not just another project, but it is a fundamental reorganization and realignment of the system of diecutting manufacturing. It is natural to be excited by the prospect of radical change and productive improvement, however, there are 7 guidelines it is important to consider. These are



- **Be Realistic.** This initiative represents a major change in the way people work, and it will take time for the entire workforce to adapt and embrace each level or each step.
- **Assess your Resources.** It is vital to be practical and make a very hard assessment of the resources, and particularly the people, who will drive the project.
- **Choose your team leaders carefully.** Resist the politically correct choice and select key players based upon their proven ability to work positively and productively with people and to work in a team environment.
- **Develop a Cost Plan-Budget.** Given the scope of the project it is sensible to develop a detailed

financial plan for the first phase only.

→ **Set Conservative Goals.** It is better to over-

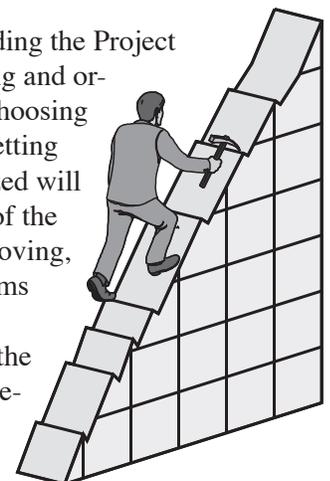
Every moment spent planning saves three to four in execution.

achieve in the beginning than over-reach and fall behind.

- **Add 25% to all time estimates for each project step, to accommodate changes in work mix, changes in people, changes in logistics and changes in technology.**
- **Start Slowly.** Getting organized and getting started is the most complex phase of this project, so allow plenty of time, for the entire workforce to adjust and to get on-board.
- **Break the Project into Bite Size Pieces or Mini-Projects.** Start with a one month goal, then two months, and then three months, to give the teams time to gel and learn to work together.
- **Communicate Relentlessly.** Get in touch, stay in touch, and keep everyone connected and engaged. Everyone who has to be involved should be involved, even though it will take longer to get things done!

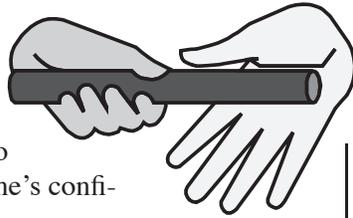


The preparatory work of building the Project Management System, selecting and organizing the Project Teams, choosing the best Team Leaders, and getting everyone focused and organized will be the most challenging part of the project. Once the project is moving, change, obstacles, and problems are inevitable, but if we have built a solid foundation, then the teams will work through bottlenecks and adapt as they go.



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Starting slow, setting readily achievable goals, may seem a pedantic way to begin, but building teamwork and success, will get the project off to a great start and build everyone's confidence.



The Program: A Plan of Action: Problems & Solutions

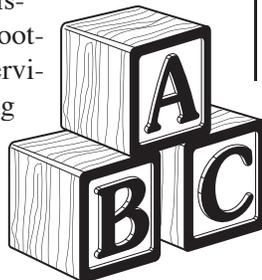
"There's a six-word formula for success: Think things through, then follow through." ~Eddie Rickenbacker

The greatest challenge we face in converting manufacturing is dealing with a fast moving, constantly changing, and often complex process, in which fighting crisis, technical problems, and bottlenecks is more than a full time job! It is not for a lack of effort, it is not usually for a lack of commitment, but it is normally for a lack of time, that process improvement is continually relegated to the back burner.

Time is the most volatile and the most precious resource we attempt to manage, and it is vital to be realistic in making an assessment of what we can do, and how much we can do, with a given project in a given amount of time. We are constantly fighting the clock, and while difficult, it is possible to manage your own time, it becomes more and more complex when we are attempting to coordinate the time of all of the participants in the various process improvement teams.

In practice, managing a project is not difficult, but managing the people and their time is endlessly complex. Maintaining accurate and up-to-date communication with each key player is a time consuming activity. Keeping everyone enthusiastic and getting everyone to the right place at the right time, with the right information and the right aptitude, is a formidable task!

Compounding this problem is the management of data and the information; scheduling meetings and preparing agendas; dealing with conflicts and disputes; fixing problems and trouble shooting; working with managers and supervisors to release key players; monitoring performance and assessing progress; and oh, by the way, completing all of the work you are normally responsible for!

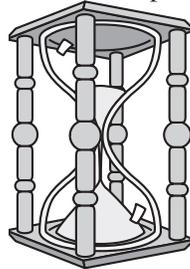


These words are not intended to intimidate or to dissuade you, from what is an essential project for your organization, but these are a plea to be realistic, when planning the scope and the speed of the project. In the early stages of this project simplicity, and a slow and a steady pace, will ultimately provide the right foundation for success.



PROBLEM ... a question or circumstance that involves doubt, difficulty or uncertainty; and is raised for inquiry and for discussion; leading to an answer, which may require research, an experiment or further evidence for its solution ...

There should be no doubt that our customers, their needs and their orders, take precedence over everything else. Therefore, the primary constraint on project organization is working around a constantly changing and unpredictable manufacturing schedule. As a result, what are the major problems we face in organizing and coordinating this project? If we examine the issues and the stages in process improvement the challenge becomes clearer.

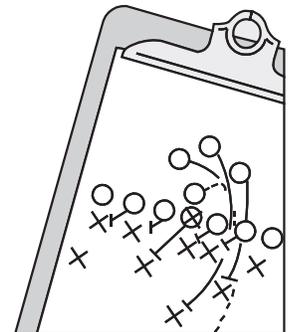


→ **TIME** - We have to gouge out time from an overburdened schedule, to organize and manage this project, and even more complex, we have to find time and coordinate time, for all the people involved in the project.

→ **SCHEDULING** - This requires coordinating the time, the activities, the resources, the people, and ongoing production, to set-up process improvement activities.

→ **PLANNING** - We must work with the team leaders and the team members, utilizing one or more meetings, to determine our plan of action for the next stage of the project.

→ **DEVELOPMENT** - Having determined a plan of action and selected the changes or upgrades, or research and testing, to determine the most effective methods & practices, we have to determine the activities and steps required



DEVELOPING A PRODUCTIVE PRESS SET-UP STRATEGY

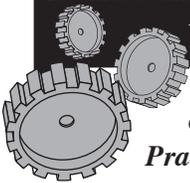
to accomplish the task.

→ **PRACTICE** - As we develop each new technique, change or upgrade to key procedures, it is necessary to test the new methods, and to make a team evaluation if the new practice is effective, or if it requires further development and testing.

→ **CONSOLIDATION** - After completing this development cycle, and having given all the key people involved time to participate, we need to consolidate the upgrade into a standard operating procedure, set preliminary benchmark standards, and create a Video Training Session.

→ **TRAINING** - Having identified a problem or an opportunity; brainstormed, revised and developed a new or an upgraded procedure; it is necessary to get everyone trained in the proper execution of the new technique.

"It pays to plan ahead. It wasn't raining when Noah built the Ark."



When we have consolidated and stabilized the changed process, we repeat the cycle of **Scheduling, Planning, Development, Practice, Consolidation, and Training.**

The problem we face is not in our ability to manage and to organize these activities, it is in our ability to make a realistic assessment of how all of these activities will integrate with existing tasks and responsibilities!

CAUSE ...is the producer of an event, or an action; or is the agent, which generates an effect, a result or a condition; and which is the original source from which any thing proceeds, and is the basis for an action or for a response...

Our industry is renowned for unfinished projects, incomplete strategic planning, and unrealized and often unrealistic expectations. We announce a project with a mighty fanfare, we start at light speed, and soon, the project quietly dies, and is rarely mentioned again.

Most would agree that this type of process improvement project is too important to ignore, and the consequences of failure are dire. So why do we struggle to integrate fast



and effective process improvement into daily manufacturing? There are a number of basic but important causes. These include:

→ **COMMITMENT** - Failing to gain the enthusiastic commitment of the Management Team, and particularly Upper Management and/or Ownership.

→ **COMMUNICATION** - Not communicating clearly with the entire organization, and failing to be realistic as to the impact of the project. Naturally, communication should be an ongoing process to explain progress and issues, and to keep everyone informed.

→ **SUPPORT** - Failing to gain the full and unequivocal support of the CAD-CAM, the Diemaking, the Pre-Press, and the Diecutting Teams. This requires dealing with those people who are mal-



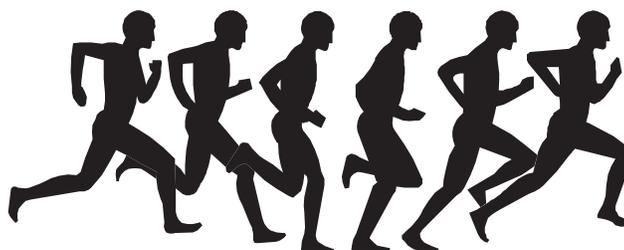
"Planning is bringing the future into the present so that you can do something about it now" Allan Lakein

contents or legends in their own minds, and who will surreptitiously and often blatantly sabotage the process. You know who they are and you must either deal with them

up front or abandon the project! It is as simple as that!

→ **COSTS** - Failing to accurately estimate the cost of the project, and failing to prepare a budget, which is approved by the President or CEO. Asking the Financial Director, or the equivalent, to help with cost estimation and budget preparation is both practical, and politically astute!

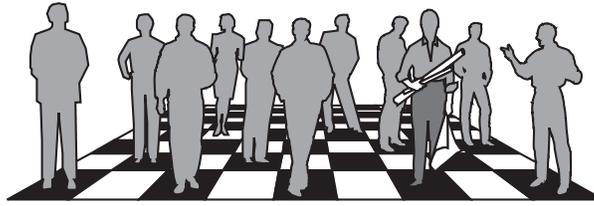
→ **TIME MANAGEMENT** - Failing to get the help you need to manage your current duties and to provide back-up when you are engaged in Project Management. This could mean a temporary assistant, a part time secretary, a Coach or Facilitator, or support from other members of the Management Team. Production must go on, but you must be realistic in your assessment of the time required to make this project work.



Unfortunately, and regrettably,

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completing all of these preparatory activities does not guarantee success, but at the very least you will have laid the foundation for a realistic and a practical system of process improvement.



ideas and suggestions; we get the benefit of all of the knowledge and all of the experience of the entire team; and approval, training, and implementation of new methods and practices, will be far less arduous.

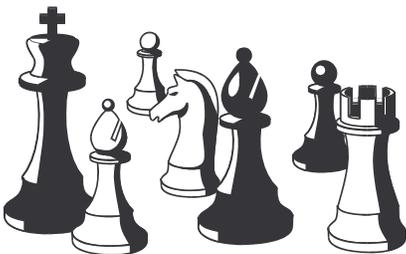
SOLUTION ...is an action or a method or a process for resolving difficulty and for solving a problem; the answer provides a demonstration of a solution and/or a statement which provides clear direction in how to solve the problem...

By turning the previously specified problems and causes of project failure into positives, by implementing these preparatory activities, it will certainly provide the groundwork for success. However, it is important to be realistic about the time and the resources we have at our disposal, and the difficulty of integrating process improvement into a volatile manufacturing process.

The obvious solution is to break the project down into more manageable pieces, and to organize and complete one project at a time. This can be further refined and more effectively controlled by implementing each project on one press at a time.

A smaller project is simpler to organize and causes less production disruption; process improvement activities, such as research, testing, and implementing new techniques are easier to schedule; the team is smaller, it can be hand picked, and will be far less challenging to work with; and the costs of process improvement and program execution are significantly lower.

This approach does require a delicate balance in the department, as it is important to include the entire team in the brainstorming and discussion, and the decision making process. If the entire team are not positively involved and comprehensively engaged, the eventual implementation of the new procedures or techniques on every press, on every shift, may turn into a struggle. It should also be obvious that we need to get everyone's ideas and suggestions so the upgraded process really is the best of the best.



By involving the entire team in many, if not all of the process improvement meetings, we demonstrate respect for their

This manual has already broken the process improvement process into a series of individual projects, which can of course be further refined and broken down into smaller projects. Naturally, the overall project will take longer to implement, however, it is by far the most effective way to approach progressive change.

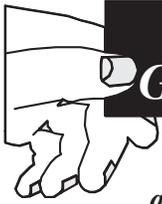
INNOVATION ... is the implementation of a new or an improved production or delivery method; or a new technique, or a procedure; which leads to progressive change and to improvement in the execution of a task or the performance of a product...

Even when we break this project down into more manageable parts, we are still facing a complex and time consuming organizational challenging. Everyone would agree that if we are going to do this project, we should do it as well as we can. The real world dilemma is most organizations run lean, and most managers and supervisors have little enough time to complete their daily duties, and realistically have little discretionary time to invest in a project of this complexity.

To overcome this deadlock it is obviously essential to add more management resources to the project team. There are 4 ways to accomplish this:

→ **A Coach/Facilitator** - We dedicated a complete chapter to the benefits of this role and this type of proactive skill applied to almost every phase of process improvement. It may have seemed this was a luxury option, however, if we do not have a member of the management team with the time to drive the project, the appointment of a coach, will certainly bridge many gaps. This does not mean the Coach is the Project Team Leader, but the person acts as an assistant to the Project Team Leader.





GET GOING!

→ *A Retired Manager - Many companies have recently retired managers or supervisors, or they are located in an area where this type of individual has retired. Many of these individuals have both the skill and the desire to dedicate one or two days per week to a project of this type. As in the previous suggestion, I would not make them the Project Team Leader, however, they would be an invaluable resource for the person filling this role.*

→ *Management Assistance - Depending upon the size and the structure of your organization, it may be possible for a number of managers and/or supervisors to provide coverage for the Project Team Leader so this individual can commit one or two full days per week to the project.*

→ *Consultative Assistance - One option is to select an industry consultant to provide organizational assistance to the Project Team Leader. Naturally, this is an expensive option, and it would be necessary for the Consultant to be located close to the operation.*

→ *Team Leader Development - It is when we face our stiffest challenges that great people, often unexpectedly, emerge. This project contains many logistical details that do not necessarily have to be executed by the Project Team Leader. Therefore, a program to develop team leaders from the technicians and craftspeople already working in the departments involved, is a practical and often a very effective technique. Dividing each project or projects into smaller projects, each driven by a small team, led by a team leader, will develop these individuals, give them a great opportunity to grow and to succeed, and it would obviously provide excellent logistical assistance to the team leader.*



As you can see, the innovation recommendations are all about project management and are not directly linked to

technical change. However, if we do not lay a solid project management foundation for this initiative, and address the organizational challenges, prior to commencing this project, our efforts will be severely constrained.

We certainly need to get this project going, but the time invested in developing a comprehensive system of project management will pay dividends in implementation, and smooth the way for rapid process improvement.

The Goals of the Program:

A Plan of Action:

“Our grand business is not to see what lies dimly at a distance, but to do what lies clearly at hand.” ~Thomas Carlyle

This manual and this program of changeover improvement is designed to provide a comprehensive range of disciplines, which can be assembled to create a professional system of diecutting manufacturing. However, you have an existing system of manufacturing, which has strengths and weaknesses, which has knowledge and experience, and which is structured in a manner to reflect the converting applications you pursue.

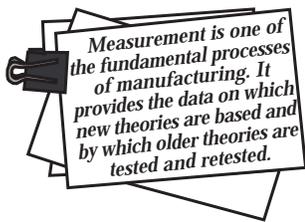
A key part of process improvement is to assess the current prowess and capability of the organization, before one can decide what is needed, what is the priority, and how do we make changes with the resources we have available. So we must begin with a diagnosis before we can select a remedial course of treatment. Therefore, the goals of the program are:

→ **ASSESSMENT** - *Complete a detailed evaluation of the diecutting changeover process, determine current benchmark standards, define current strengths and weaknesses, and evaluate resources and opportunity.*

→ **ASSESSMENT** - *Complete an evaluation of the current system of management to determine the capability of the existing management team to organize and to successfully execute a*



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complex project, in addition to their normal duties and responsibilities.

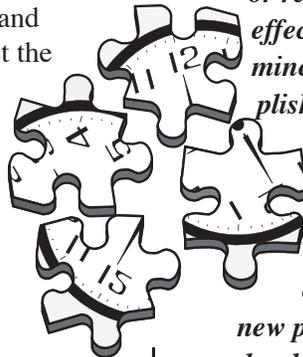
→ DEVELOPMENT

- Develop a plan of action, which is designed to attack and solve current weaknesses and to build an effective system of changeover organization.

→ **DEVELOPMENT** - *Develop a plan of action, which is designed to maximize the capabilities of the current team of managers and technicians, and to enable the timely improvement of the changeover process.*

These are simple but challenging goals. First, find out where we are and what we need; second, determine what we are capable of, given the resources available; third, develop a plan which attacks these problems; and fourth; make sure the plan is adjusted to reflect the ability to organize, administer, and manage the project.

Naturally, these goals can be changed or upgraded based upon the determination of the company to invest in the process, and to add project support services.



time for all the people involved in the project.

→ SCHEDULING

- This requires coordinating, the time, the activities, the resources, the people, and ongoing production, to set-up process improvement activities.

→ **PLANNING** - *We must work with the team leaders and the team members, utilizing one or more meetings, to determine our plan of action for the next stage of the project.*

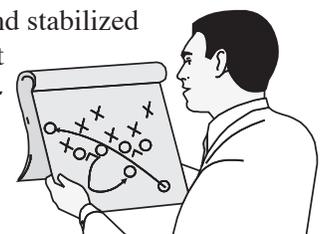
→ **DEVELOPMENT** - *Having determined a plan of action and selected the changes or upgrades, or research and testing, to determine the most effective methods & practices, we have to determine the activities and steps required to accomplish the task.*

→ **PRACTICE** - *As we develop each new technique, change or upgrade to key procedures, it is necessary to test the new methods, and to make a team evaluation if the new practice is effective, or if it requires further development and testing.*

→ **CONSOLIDATION** - *After completing this development cycle, and having given all the key people involved time to participate, we need to consolidate the upgrade into a standard operating procedure, set preliminary benchmark standards, and create a Video Training Session.*

→ **TRAINING** - *Having identified a problem or an opportunity; brainstormed, revised and developed a new or an upgraded procedure; it is necessary to get everyone trained in the proper execution of the new technique.*

When we have consolidated and stabilized the changed process, we repeat the cycle of **Scheduling, Planning, Development, Practice, Consolidation, and Training.**



Measurement is one of the fundamental processes of manufacturing. It provides the data on which new theories are based and by which older theories are tested and retested.

“Waste can be defined as anything other than the minimum amount of equipment, material, parts, tools, space, and the worker’s time, which are absolutely essential to add value to the product.” Fujio Cho - Toyota

The Program: A Plan of Action: Methods & Practices

“Let us not be content to wait and see what will happen, but give us the determination to make the right things happen.” ~Peter Marshall

In the Problem Section of this Chapter, the following items were defined to explain a failure to implement an effective project management structure, which would ensure success. Naturally, if these are steps we should have taken, they are obviously an important part of the methods and practices we should adopt to manage this project.

→ **TIME** - *We have to gouge out time from an overburdened schedule, to organize and manage this*

project, and even more complex, we have to find time and coordinate

Most organizations, left to their own devices, are going to atrophy, to get so institutional, so bureaucratic, that they get to the point where their original reason for existence has been lost, and they stagnate. So you have to change, and by that I mean dramatic change.

William G. McGowan

If we follow these recommended operating procedures, and we invest in a comprehensive project pre-planning and preparation discipline, then our chances of long term success are higher.

The Program:

A Plan of Action:

The Benefits of Change

"We are face to face with our destiny and we must meet it with a high and resolute courage.

For us is the life of action, of strenuous performance of duty; let us live in the harness, striving mightily; let us rather run the risk of wearing out than rusting out."

~Theodore Roosevelt

Ask yourself this simple question. Do we have a choice? We have to do something! Times have changed, the



market has changed, the industry has changed, and the economy has changed. In a smaller, more competitive, global market only the determined, the professional, and the accomplished organizations will survive.

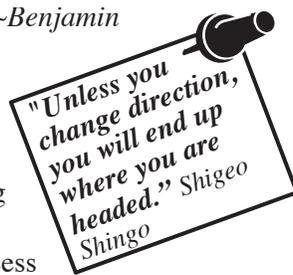
There is less and less room for error. There are fewer places at the table. We have to be faster, we have to be better, and we have to be the lowest cost producer in our market segment. Response time, speed, turnaround, throughput and cycle time are some of the rapidly changing factors, which determine our future success and our future survival.

This manual represents one plan of action, and while it may not precisely reflect your specific needs, it does provide a template and a structure around which you can devise your customized plan of action. What are the benefits of change? Survival!

A Plan of Action: Recommended Actions

"Action may not always bring happiness; but there is no happiness without action." ~Benjamin Disraeli

It is unrealistic for an organization which is not built, is not practiced, and is not experienced in practicing aggressive daily process improvement, to embark upon a major process



improvement program.

If you do have the experience and the resources to attack this project comprehensively, that is obviously the best way to begin, but for most organizations the recommendation is to proceed at a pace, which reflects the ability of your management and diecutting teams.

Start slowly and build confidence and competence step-by-step; utilize team work and team building; stop regularly

to ensure everyone keeps up and consolidates changed methods and practices; and build upon each success to accelerate progressive change.



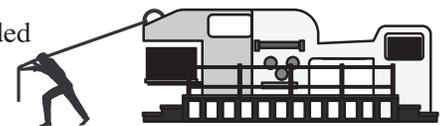
The obvious solution is to break the project down into more manageable pieces, and to organize and complete one project at a time. This can be further refined and more effectively controlled by implementing each project on one press at a time.

A smaller project is simpler to organize and causes less production disruption; process improvement activities, such as research, testing, and implementing new techniques are easier to schedule; the team is smaller, it can be hand picked, and will be far less challenging to work with; and the costs of process improvement and program execution are significantly lower.

This approach does require a delicate balance in the department, as it is important to include the entire team in the brainstorming and discussion, and the decision making process. If the entire team are not positively involved and comprehensively engaged, the eventual implementation of the new procedures or techniques on every press, on every shift, may turn into a struggle. It should also be obvious that we need to get everyone's ideas and suggestions so the upgraded process really is the best of the best.

By involving the entire team in many, if not all of the process improvement meetings, we demonstrate respect for their ideas and suggestions; we get the benefit of all of the knowledge and all of the experience of the entire team; and approval, training, and implementation of new methods and practices, will be far less arduous.

We also recommended augmenting the current management



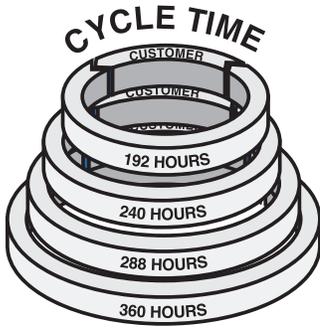
The ABC's of Fast Diecutting Press Changeover!

team to organize and to manage this project by considering the use of the following.

- *A Coach/Facilitator*
- *A Retired Manager*
- *Management Assistance*
- *Consultative Assistance*
- *Team Leader Development*



Ultimately, you and your colleagues must make your assessment and develop a plan of action which reflects



your needs and abilities. The most important recommendation is to be cautious, to be patient, to be realistic, and to be optimistic.

I like Joseph Conrad's comments, when he stated: ***"To have his path made clear for him is the aspiration of every human being in our***

beclouded and tempestuous existence."

But I also respect the humor of Winston Churchill, who remarked; ***"I'm just preparing my impromptu remarks."***

Good luck!

Section Twenty Five:

The Program: A Plan of Action: Summary

The following pointers are some of the key principles you should have gained from completing this chapter. If you need to refresh your memory...

- ✓ This is not just another project, but it is a fundamental reorganization and realignment of the system of diecutting manufacturing. It is natural to be excited by the prospect of radical change and productive improvement, however, there are 7 guidelines it is important to consider. These are:
 - ➔ **Be Realistic.** *This initiative represents a major change in the way people work, and it will take time for the entire workforce to adapt and embrace each level or each step.*
 - ➔ **Assess your Resources.** *It is vital to be practical and make a very hard assessment of the resources, and particularly the people, who will drive the project.*
 - ➔ **Choose your team leaders carefully.** *Resist the politically correct choice and select key players based upon their proven ability to work positively and productively with people and to work in a team environment.*
 - ➔ **Develop a Cost Plan-Budget.** *Given the scope of the project it is sensible to develop a detailed financial plan for the first phase only.*
 - ➔ **Set Conservative Goals.** *It is better to over-achieve in the beginning than over-reach and fall behind.*
 - ➔ **Add 25% to all time estimates for each project step,** *to accommodate changes in work mix, changes in people, changes in logistics and changes in technology.*
 - ➔ **Start Slowly.** *Getting organized and getting started is the most complex phase of this project, so allow plenty of time for the entire workforce to adjust and to get on-board.*
 - ➔ **Break the Project into Bite Size Pieces or Mini-**

Projects. *Start with a one month goal, then two months, and then three months, to give the teams time to gel and learn to work together.*

- ➔ **Communicate Relentlessly.** *Get in touch, stay in touch, and keep everyone connected and engaged. Everyone who has to be involved should be involved, even though it will take longer to get things done!*
- ✓ The preparatory work of building the Project Management System, selecting and organizing the Project Teams, choosing the best Team Leaders, and getting everyone focused and organized will be the most challenging part of the project. Once the project is moving, change, obstacles, and problems are inevitable, but if we have built a solid foundation, then the teams will work through bottlenecks and adapt as they go.
- ✓ The obvious solution is to break the project down into more manageable pieces, and to organize and complete one project at a time. This can be further refined and more effectively controlled by implementing each project on one press at a time.
- ✓ A smaller project is simpler to organize and causes less production disruption; process improvement activities, such as research, testing, and implementing new techniques are easier to schedule; the team is smaller, it can be hand picked, and will be far less challenging to work with; and the costs of process improvement and program execution are significantly lower.
- ✓ This approach does require a delicate balance in the department, as it is important to include the entire team in the brainstorming and discussion, and the decision making process. If the entire team are not positively involved and comprehensively engaged, the eventual implementation of the new procedures or techniques on every press, on every shift, may turn into a struggle. It should also be obvious that we need to get everyone's ideas and suggestions so the upgraded process really is the best of the best.

Section Twenty Five:

The Program: A Plan of Action: Questions?

The following questions are designed to stimulate critical review of the information you have assimilated and the resulting ability to understand how and why traditional creasing and folding work. There is not a test, but it is designed to reinforce the important principles of the creasing process, and to provide a foundation for further more sophisticated principles and more complex techniques...

- ✓ Why is the Changeover Project different from other projects the company has implemented?
 - ✓ Why is it necessary to develop a comprehensive plan of action?
 - ✓ There are seven guidelines specified as important to successful implementation of a plan of action, explain three of these recommendations?
 - ✓ What are the advantages and disadvantages of starting the project slowly and cautiously, and how would you recommend proceeding?
 - ✓ What would you consider the most difficult part of putting an effective plan of action together, and why?
 - ✓ Why is it so difficult to improve the process on a daily basis, and what recommendations would you make to change the situation?
 - ✓ Who would you select to be the Project Team Leader, and why is this the most effective choice?
- ✓ Would you plan the entire project from start to finish or would you break the project down into more manageable tasks?
 - ✓ How do your colleagues feel about process improvement initiatives, and what is the basis for their perception?
 - ✓ Is your current system of diecutting manufacturing standardized and are you working to established benchmark standards. And if not, why not?
 - ✓ How would you rate the current performance standards of the diecutting organization, and what are the strengths and weaknesses of the operation?
 - ✓ If you were appointed Project Team Leader, how would you begin to organize this project?
 - ✓ Do you feel everyone in the current diecutting operation would sign on and enthusiastically endorse this project? And if not, why not?
 - ✓ How would you develop the plan of action to ensure everyone participates, and everyone supports the initiative ?
 - ✓ What is the greatest challenge for you and for your colleagues, in accepting a radical change to the current system of diecutting manufacturing?

Manufacturing System of Organization

The Program: Summary

The Program - Summary: An Overview

“Don’t fear failure so much that you refuse to try new things. The saddest summary of a life contains three descriptions: could have, might have, and should have.”

~Louis E. Boone

The diecutting changeover discipline is the heart of the converting organization because this is where everything comes together and the product first emerges. There is tremendous pressure to be fast and efficient, however, this must be evenly balanced by the need to be effective and precise. In practice, diecutting changeover is a bottleneck in most organizations, and it is a key benchmark of how effective that organization is in terms of manufacturing efficiency.

With a changing market place, shorter production runs, inventory supply methods, and faster response times, changeover efficiency is a barrier to productive growth and to competitive survival. This difficulty is by and large in part because the integration of a range of disciplines, the combination of often conflicting processes, and a poor understanding of how to organize the diecutting process.

This manual or program is a breakdown of diecutting press changeover, an analysis of the operating structure, and a suggestion of how to organize these disciplines, to optimize a seamless flow from one job to the next. One of the problems for everyone involved in improving the changeover process is a failure to recognize each of the key disciplines, which must be combined and carefully integrated to ensure consistent success.

There are 25 disciplines involved in diecutting press changeover, these are:

- ✿ *Workplace Safety*
- ✿ *Teamwork & Teambuilding*
- ✿ *Customer-Supplier Organization*
- ✿ *The Education Cycle*
- ✿ *Training & Skill Development*
- ✿ *Standardize & Benchmark*
- ✿ *Research & Development*
- ✿ *Document the Process*

- ✿ *Time Management*
- ✿ *Measurement Systems*
- ✿ *Just-in-Time Organization*
- ✿ *Single Minute Exchange of Die*
- ✿ *Inventory Management*
- ✿ *Simplification*
- ✿ *Computer-Integrated-Manufacturing*
- ✿ *Toolmaking Organization*
- ✿ *Pre-Press Organization*
- ✿ *Team Changeover*
- ✿ *Diecutting Quality Control*
- ✿ *System Maintenance*
- ✿ *The Facilitator*
- ✿ *Closing-the-Loop*
- ✿ *Plan-of-Action*

In practice, there are few issues in press changeover that are complex and difficult to organize. The challenge is, successful performance in each discipline is predicated on successful performance in every other discipline. Diecutting changeover is about details, about careful preparation, and about an aggressive search for knowledge. Every diecutting cycle reveals new information, new solutions, new problems, and more effective ways to do things. Unfortunately, if we are not set-up to capture and consolidate the education every production cycle provides, we are condemned to repeat the same problems and mistakes, time and time again.

Compounding this problem is everyone is doing things differently, and even more damaging each procedure is executed inconsistently and in a random fashion from one changeover to the next. This slows and corrupts the learning cycle, and makes process improvement virtually impossible. If you look at every recommendation, it is built upon a foundation of consistency, of procedural uniformity, and of a pedantic attention to detail. Each piece in a jigsaw puzzle is essentially simple to position, but if you don't have a picture it is an impossible nightmare.

The bottom line is we must develop a consistent approach

The ABC's of Fast Diecutting Press Changeover!

to diecutting changeover. We must combine all of the knowledge and all of the experience of all of the technicians into a series of best operating procedures. Without this basic discipline, benchmarking and process improvement and the progressive development of greater knowledge and higher skill is severely constrained.

Program Execution

“Positive anything is better than negative nothing!” ~Elbert Hubbard

Success in this program is predicated on effective teamwork and teambuilding. Without a genuine commitment to the principles and practices of working as a team, progress will be difficult! If you lack experience in teambuilding, get help! An effective team is one of the cornerstones of changeover improvement.

The second challenge is finding time to be an effective Project Team Leader, and the next challenge is to find and schedule time for the project team to work and to develop as a cohesive team. Process improvement in diecutting operations consistently fails because in spite of the impressive rhetoric, improvement is constantly pushed to the back burner, day-after-day. There is no doubt that meeting customer requirements is the driving focus of any operation, however, we have to aggressively gouge out time to work on this project!

However, do not regard this manual as a, or the definitive method of organizing diecutting press changeover! It is more effective to regard the manual as a catalyst, which will become effective, when it is combined with the ideas and suggestions of the entire team.

Which also means we have to get everyone involved! First, because we have to develop a standardized approach to key activities; second, because it is critical to integrate all of the knowledge of all of the team members into improving the process; and finally, because we need to build parity and consistency, as a unified team.

No matter what the eventual goal or the timetable you have set for the team, break the project into smaller mini-projects. This will minimize the organization tasks; it will cause less disruption to current production activity; and it will be a powerful unifying force to start and to successfully complete one step in the project. It is so much easier to take small steps in the beginning. Consider it basic training or a boot camp in preparation for the more complex and challenging assignments, later in the project.

In addition, my experience with this type of project is to caution you, to add a minimum of 25% to any time estimate, for any meeting or activity, to provide for inevitable bottlenecks, production crisis and fluctuation; and other unexpected issues. Douglas Adams: ***“I love deadlines. I like the whooshing sound they make as they fly by.”***

This is a learning process, in which consistency and procedural uniformity is critical. Therefore, consolidate every approved technique, method or procedure into a videotape training module. Then allow sufficient time for *everyone* to master the new procedure. Remember training is either behavior development and/or behavior modification, and it usually takes 10 to 20 correct repetitions of any activity, to build an effective habit!

Finally, whether you are the Project Leader or a team leader, do not start until you are ready! The announcement of this initiative will get everyone's attention, and everyone will have a different picture of what it means, when it should happen, and how it should be organized! Resist any and all pressure and resist any and all temptation, to start before you are ready!

Finally, a proverb and a humorous quotation to consider: ***“An army of sheep led by a lion would defeat an army of lions led by a sheep.”***

... and, inevitably from Murphy ...

Murphy's First Law: Nothing is as easy as it looks.

Murphy's Second Law: Everything takes longer than you think.

Murphy's Third Law: Anything that can go wrong will go wrong, and at the worst possible time.

Murphy's Fourth Law: If there is a possibility of several things going wrong, the one that will cause the most damage will be the one to go wrong.

Murphy's Fifth Law: If anything just can't go wrong, it will anyway.

Murphy's Seventh Law: Left to themselves, things tend to go from bad to worse.

Murphy's Eighth Law: If everything seems to be going well, you have obviously overlooked something.

Good Luck!

