GOING FOR THE GLOBE

By: Michael J. Stickler
Empowered Performance, LLC

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Part I – Assessment

First came Material Requirements Planning (MRP), then Manufacturing Resource Planning (MRP II), now Just-In-Time (JIT) and Total Quality Control (TQC). Each step in this journey toward improvement poses a greater challenge to those American manufacturers who possess the desire and discipline to achieve excellence in the operating performance of their companies.

The ultimate goal of companies on the continuous journey toward excellence is to reach World Class levels of manufacturing performance. Without World Class performance, they know they cannot expect to be World Class competitors in today's increasingly global markets.

The journey to World Class is by no means an easy one. It requires substantial investment in technology and people; fierce attention to detail in every area of the business; and unwavering commitment by every member of the company to make the journey succeed.

With so much at stake, it is imperative to know that your company is focusing on the issues that will make it succeed. Your company can get that assurance through utilizing three proven practices to keep you on the correct course:

(1) operations assessment;
(2) elimination of waste; and
(3) performance measurement.

More than management practices, these three activities must become the company's mindset - part of the corporate culture - the way it does business.

In this series of three articles, we will take a close look at each of these practices. Our ultimate objective is to provide a concrete answer to the question:

What is World Class performance?

Let's begin with the assessment process, since all progress to World Class must begin with an assessment of where the company is now.

Three Key Areas

In terms of everyday manufacturing operations, achieving World Class performance depends on how efficiently a company operates in three key areas:

(1) Technology Management;
(2) People Management; and
(3) Systems Management.

The technology management objective in a World Class company is to establish a flexible manufacturing environment. This means shortening the timeline from customer order to cash by shortening the total business throughput time.

The people management objective in a World Class company is to encourage continuous improvement through its people. This means creating an environment where all levels, both management and hourly workers, are given the responsibility and authority to suggest improvements and implement them. The environment is one of active risk taking.

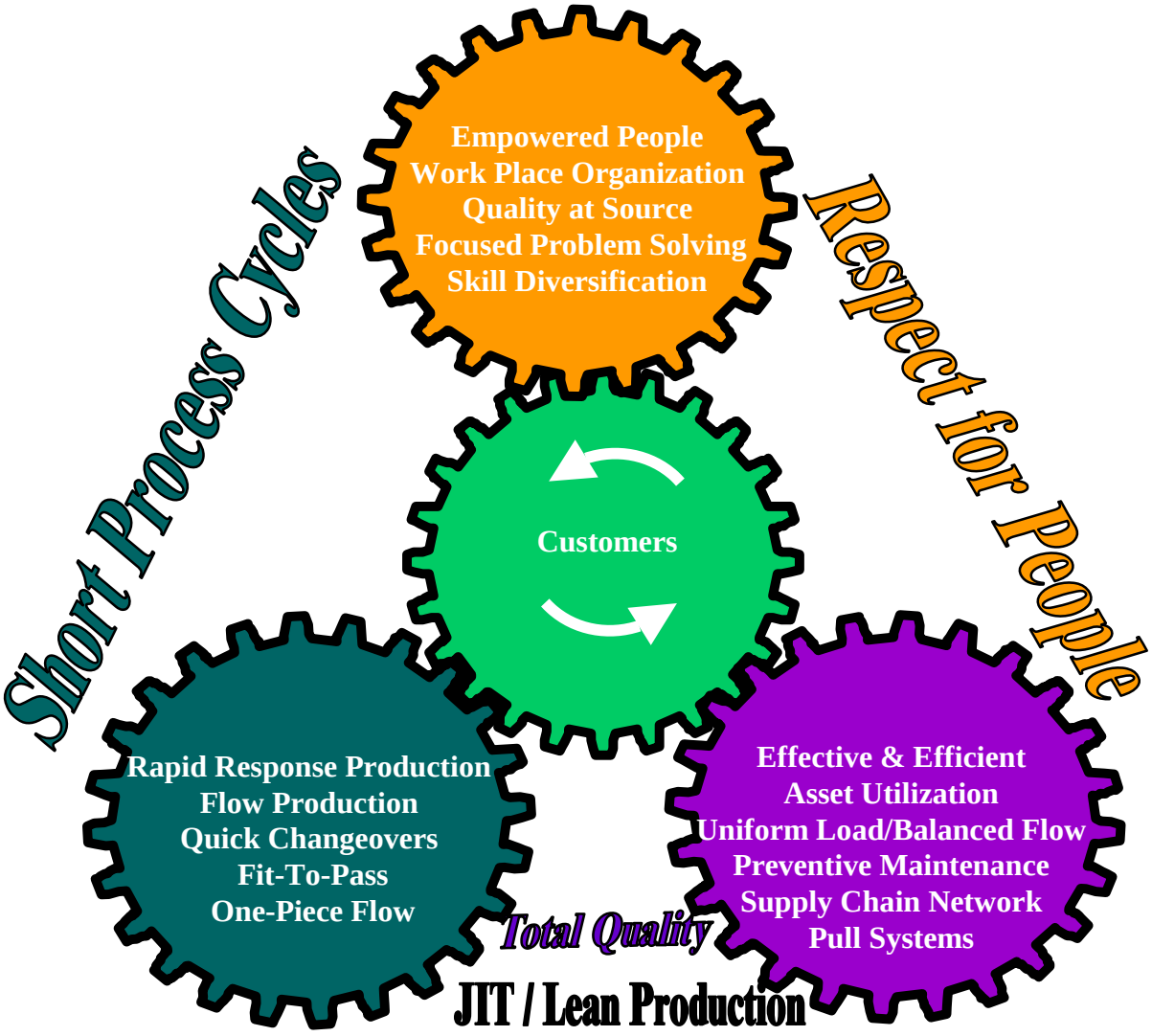
The systems management objective is to carefully apply the limited resources of the business: equipment, material, people, money and time. This may require a reorganization from traditional functional disciplines to a more cooperative and integrated style of organization that stresses flow approaches in order to maximize the efficient use of resources.

When a company is striving to become World Class, it should look to put these three management areas in balance.

JIT Elements Set World Class Direction

Our approach is to focus on each of the Just-In-Time elements that can be applied within the three management areas and to understand the impact of each on the business (*Figure 1*).
The first step in the quest for World Class is to evaluate the existing business. Each of the three management areas poses basic questions about the company's capabilities and the applicability of each JIT element to the business.

Figure 1: Interlocking Elements of JIT



Balancing the three key management areas by pursuing JIT elements leads a manufacturing company to the competitive benefits of World Class performance.

Technology Questions:

(1) *Structured Flow Manufacturing* - Are the processes organized from a functional layout to a structured flow mode? Have you minimized space and time between operations by bringing operation processes closer together?

(2) *Small Lot Production* - Is there an active program to cut lot sizes? The objective should be to cut lot sizes in half and in half again until we reach the lot or batch size of one.

(3) *Setup Reduction* - Is there an active program to reduce setups or changeovers? As lot sizes are reduced pressure is exerted on the changeover or setup process. The objective should be to have all setups in single digits or under 10 minutes.

(4) *Fitness For Use* - Are you considering each work center or succeeding operation as a customer? Do you research and understand the customer or next work center's precise needs? Are products or materials presented to the next operation so that only value added work is done?

People Questions:

(5) *Total Employee Involvement* -Are suggestions for improvement being implemented at all levels in the organization through the use of small group improvement activities? Is continuous improvement the ongoing philosophy of the business?

(6) *Control Through Visibility* - Is there a method in place that communicates goals, highlights problems and attacks waste?

(7) *Housekeeping* - Is the workplace highly organized for efficiency? Is there a housekeeping program in place with time set aside each day to improve the workplace?

(8) *Total Quality Focus* - Is there a habit of continuous improvement? Is quality the responsibility of production? Do you insist on compliance and do you stop the production process when there is a quality problem?

System Questions:

(9) *Level Load and Balanced Flow* - Are all the production areas synchronized to meet the required output-not only your internal activities, but also those of your suppliers?

(10) *Preventative Maintenance* - Are all pieces of equipment in a constant state of readiness? Is maintenance performed by the machine operator and is time allowed each day for the activity?

(11) *Supplier Partnerships* - Are long-term relationships being established based upon a total cost perspective rather than price? Are the shared quality goals in place?

(12) *Pull Systems* - Is there a mechanism in place through the production process with the objective of keeping the time of producing parts as dose as possible to time of using parts?

When these 12 Just-In-Time elements are in place in a manufacturing environment, the result is a company with a Total Quality Focus, a workforce striving continually to improve the process, and a business with flexibility achieved through short manufacturing cycles.

Yet, very few American companies have implemented all of these 12 elements. Some have instituted a few, but the great majority have not really established any of these elements. Where are they to begin?

The starting point is a major assessment of the company's operations that delves beyond the more general questions asked above to look at the functions that make up each element and that indicates the company’s readiness to implement each element.

Once an element is selected for implementation and mastered, the assessment must be performed again and again and again-throughout the journey to World Class, until as many of the 12 elements as possible are in place.

Improvement Means Change

Does your company aspire to World Class manufacturing performance? To succeed, that aspiration must first be grounded in your company’s internal desire to improve, not just on fear of competitors both near and far on the globe.

Improvement means change, and companies that really want to be World Class must commit to constant change. Change must become part of your company's mindset-along with continual assessment, looking to eliminate waste, and striving for top performance measurements.

Finally, to succeed, this new mindset must be internalized by everyone in the company and reinforced with continual communication, feedback and support. The end result is exceptional performance and a business culture that builds loyalty, pride and profitability.

Part II – Eliminating Waste

Not long ago, inventory was thought to be a good thing. In management's mind it was viewed as an asset and represented future sales.

How quickly the mood has changed! With today's emphasis on the bottom line, inventory is now being understood as a liability. Manufacturers can no longer afford the insurance of a comfortable inventory cushion and other unnecessary cost generators if they are to remain competitive in global markets.

Lifewise, those global markets have changed. Many competitors are now operating from different parts of the world and enjoy advantages not readily available to American manufacturers. Many are located in more densely populated industrial communities such as Japan, where waste-saving Just-In-Time relationships with vendors and within facilities arose naturally. Other international competitors are situated in countries with a highly homogenous manufacturing workforce, where common values, training and social behavior can be assumed, making cooperative work arrangements and change to reach common goals easier to implement. Still other competitors have the added advantage of lower economic standards, particularly companies in Mexico, Southeast Asia and Korea who can thus keep labor cost low.

To offset these advantages, the American manufacturer must retaliate in kind by eliminating waste, such as inventory, from operations in order to sell products with competitive pricing and quality in world markets.

Identifying Waste

Parallel to undertaking an assessment process to establish a company's potential for reaching JIT objectives (*See "Going for the Globe: Part I – Assessment*), a manufacturer seeking World Class performance must also be scrutinizing the company to identify and eliminate waste.

What is waste? In many companies, the first reaction to that question is to look at direct labor cost. Yet, in most manufacturing businesses today, that is usually 10 percent of cost of goods sold or less. In some companies it is as little as two percent.

A far more productive response is to categorize all activities in the business as either adding value or adding cost (waste). How much waste do you have in your business?

One way to clearly visualize waste is to perform a short mental exercise. Imagine taking a can of red spray paint and walking through your business or manufacturing process and anywhere you see cost-added activity, mark an X. How much red paint would you need? How many cans? How many cases?

What is cost-added? One example is inventory sitting between or before operations. Another example is the material handling required to move material to and from operations. Nor is there value added in inspecting material or reworking rejected material (*See Figure 1*).

In short, anything that does not add value directly to the product is cost-added and is waste. Take a look again at your factory floor. How much of the activity is work? (Not motion, but work?) How much of the activity is waste? Looking beyond your factory floor to the entire company, how much of the activity if work? How much is waste?

In nearly every business, between 50 percent and 70 percent of all activities are cost added, not value added. A World Class Manufacturer continuously strives to **eliminate** as much of the cost-added from the entire business throughput process as possible.

Three-Step Rule for Reducing Waste

The method that we recommend to aim at reducing waste involved three steps. The first step is to reduce that 70 percent by 50 percent. Then reduce by 50 percent again, and finally make it 10 percent of what it was – a total reduction of 90 percent (*See Figure 2*).

When we present this rule to companies, we are usually asked – Fifty percent? Why so high? Why not aim for something doable, like 10 percent.

Yet, how hard is it to achieve 10 percent savings in any one area? And, if you aim for 10 percent and only achieve eight percent, won't it probably pass as acceptable? What do you have to change to get eight percent waste reduction? Not much.

If you aim for 50 percent, you'll have to change. You'll really have to do some things differently. And, if you only get 45 percent, you won't have failed. You'll be far ahead of where you would be, starting with a far lower improvement target. You'll be much closer to World Class. A World Class Manufacturer works the three-step rule for eliminating waste to achieve a 90 percent reduction in waste.

SEVEN TYPES OF WASTE

1. Process
2. Delay & Waiting
3. Over Production
4. Motion
5. Transportation
6. Inventory
7. Scrap & Rework

Seven wastes are commonly hidden in accepted operations within a manufacturing company.

Figure 1

THREE STEP RULE FOR ELIMINATING WASTE

REDUCTION	TOTAL
Reduce by 50%	50%
Reduce by 50% again	75%
Make it 10% of what it originally was	90%

A World Class company works the Three-Step Rule to arrive at 90 percent reduction in waste.

Figure 2

The truth is that most American manufacturers are chest deep in dollar bills that are just scattered over their factory floors, waiting to be picked up. Unfortunately, the people haven't been trained to see them. Instead, they have been trained to see time-honored traditions that both they and management resist changing. Meanwhile, management applies itself to trying to find the million-dollar bill that, if saved, will solve all the problems with one, quick, cost-cutting solution.

Fundamental vs. Superficial Solutions

Chasing the million-dollar bill often leads to the million-dollar solution – one that ultimately costs, rather than saves a million dollars. These solutions are superficial problem solvers that usually add more waste, rather than eliminate any.

For example, a factory is using a forklist to transport material, which it transports in batches. Seeking an improvement and wishing to eliminate the waste in this operation, management invests in linking the equipment together with a conveyor.

Now, the process has bcome quicker, but they are still doing transportation. They still have Work-In-Process inventory, and they still are running work in batches.

The conveyor is a superficial improvement. A fundamental improvement would have been to bring the equipment together and eliminate transportation. When a company works the Three-Step Rule, it nto only needs to train its people to see and pick up the dollars off the factory floor – and the office floor as well – it needs to discipline itself to attack waste fundamentally.

That means that everyone needs to be regrounded in the fundamentals of the business. What is the core work in your business – the value-added work? What does it take to support the core work? In the simplest structure?

Let's take a look at another example, this time from the office side of manufacturing. A review that was done of purchasing procedures in one company uncovered that the company used 110 different forms and reports. It typically took the department between four to eight weeks from the time it received a requisition to the time when it placed the order. Each order placement involved nearly every one of the 110 forms.

Perhaps there is a perverse notion at work in this kind of procedure that suggests the company saves money when it delays spending it. How do we do that? By making the process more sophisticated. Yet, the result was that it cost $100, minimum, for the company to generate a purchase order.

In addition, delays in purchasing often created delays in production and the remifications to shipping, customer service – all areas of the company – increased from there. Meanwhile, very little of the activity in purchasing supported the core work, which, in simplest terms, required three steps: *requisition*, *sourcing*, *costing and ordering*.

In short, eliminating waste means simplifying procedures in every area of the business. Fundamental improvements usually simplify operations but are hard to achieve. Superficial improvements are usually more sophisticated and easy to buy, but ultimately they turn out to be more costly to implement than fundamental improvements.

Is Change Worth It?

Any manufacturing company that has been operating a lon time gives credit for its success to its traditions – the way it does business.Those traditions, even if they include using 110 forms in purchasing, can be seen as an investment.

"Someone spent time developing, printing, training for them, and we might discover after we've eliminated them, that they are still necessary." Says mnagement teams who are hesitant about seeking dramatic changes in the work processes of their companies.

Yet, World Class companies don't hesitate at eliminating wasteful traditions and turning time-worn investments into new profits. They usually have a strong desire to change. In fact, they usually have no choice.

Most manufacturing companies that are seeking Class A MRP II, JIT, TQC and World Class are companies that have faced difficulties in the recent past. Those who are succeeding at instituting change have demonstrated that you need four key change motivators or you won't get change and improvement.

- You ned a crisis – that's an inevitable stimulus for change.
- You need a champion or champions for change who can influence people.
- You need for the people to rise up and demand – as well as implement their own – changes.
- You need new technology, another sure innovator.

Without these in place, there is small likelihood that a company can be successful at implementing change. Especially at going after eliminating waste by 50 percent.

World Class companies recognize that waste can be converted to profit and drop straight to the bottom line. Consider this example.

Suppose Company A chalked up the following for 1989.

Cost of Sales	$100 million
Inventory	$50 million (two turns against cost of sales)

In 1987, cost of sales went up, and because of an aggressive JIT program, inventory went down.

Cost of Sales	$150 million
Inventory	$25 million (six turs against cost of sales)

If there had been no improvement in inventory turns over 1986, inventory would have grown to $75 million. Thus the reduction of inventory represents a Waste Elimination Profit of $50 million.

This profit can be calculated for all seven of the wastes to provide a quantitative, bottom-line measure of continuous improvement.

Meanwhile, arm yourself – mentally – with those cans of spray paint. Begin the process of watching for and marking the cost added in your business. Those red Xs are your targets for eliminating waste.

World Class Wages War on Waste
Once a company's three mnagement areas – technology management, people management, systems management – are in balance, eliminating waste from the business becomes second nature, a daily vigil.

- The technology management objective of a flexible manufacturing environment with shortest timeline from order to cash eliminates wasted time from the manufacturing process.
- The people management objective of involving everyone at all levels in improving the process encourages them to pick up the dollar bills from the work place floor.
- The systems management objective of applying all resources with considerable care tops the innate efficiencies already existing in those resources.

Is your company prepared to waste war on waste?

Do you view manufacturing as a strategic weapon rather than a cost center?

If not, are you ready to change?

Part III – Performance Measurement

In the mid 1970s, global competition heated up for American manufacturers. At the same time, hardware and software for business planning and control systems came increasingly within reach of an ever-growing number of manufacturing companies.

Thus, it appeared that technology had matured just in time to save the day, and many American manufacturers enthusiastically invested in Material Requirements Planning (MRP) and Manufacturing Resource Planning (MRP U) technology solutions, assuming that greater data capture-and-control power would automatically produce the efficiencies that they needed to restore their World Class footing with competitors around the globe.

Yet, many potentially first-rate American manufacturing companies failed to soar with advanced systems. Having learned that technology alone cannot improve business performance, today's manufacturing management has placed a new emphasis on its work force. We have all learned that, in the end, only people can deliver performance through efficient use of technology solutions.

Turning Objectives into Accomplishments

Manufacturing companies who succeed in reaching Class A, then World Class, are those who recognize that the people management, technology management and business management systems of their companies must be balanced. (See Part I - Assessment"). Change and advancement in one system-such as technology-mandates change and advancement in the other two, with particular care given to the people management system.

The people management objective in a World Class company is to develop flexibility and encourage continuous improvement through its people. This means encouraging all employees-management and workers-to be aware, to think, to accept change, to voice suggestions for change and improvement, and to make them work.

Again, the four ITT elements for people management-housekeeping, control through visibility, total quality and total employee involvement-set the standards for World Class and chart the course for continuous improvement.

All these elements require teamwork among people who fully understand the company's standards and objectives and are committed to making steady disciplined progress toward achieving manufacturing excellence. Performance measurement is the tool for communicating goals and achievements throughout the entire organization as well as for assuring that the company is focusing on the right things.

Measurements that Focus on Waste

When a manufacturing company seeking World Class declares war on waste, (*See Part II-Eliminating Waste*) six key measurements are established. Employees are educated to focus on them by product and area. (*Figure 1*).

Figure 1

SIX MEASUREMENTS FOR WORLD CLASS

1. Cycle time by product
2. Inventory turn by product
3. Set up times on equipment
4. Output/Productivity by product per person
5. Quality-rejected material
6. Suggestions for improvement by product per day per person.

Continuous improvement on each of these measurements charts the progress toward World Class Manufacturing Performance.

Any company that is striving to be World Class must use these measurements to target waste for reduction. The method that we recommend is to aim at eliminating waste by at least 50 percent. Then, reduce it again by 50 percent. Then make it 10 percent of what it was-a total reduction of 90 percent. A World Class Manufacturer is someone who has eliminated 90 percent of the waste from the business and is still working on that last 10 percent.
These six measurements must be reviewed monthly, with the expectation that they will demonstrate steady and disciplined progress-continuous improvement.

Evolution and Progress:

One World Class Company's Measurement System

In the fall of 1985, a large manufacturer of software and documentation with over $450 million in annual sales took a head-on look at its problems and discovered they were legion.

Orders were going out later and later. Order turnaround time was getting longer and longer. New products were not ready to release on time. Quality problems bounded a sizable number of orders back. And inventory was high.

This was no way to run a World Class company, and this company was determined to be World Class. It had to in order to survive in its cut-throat-competitive global market.

Management committed to achieve the following aggressive business goals.

- **Class A MRP II > 95 percent**, with continuous increase in standards and levels of performance.
- **Average Order Turnaround < 6 days**, from receipt of order to shipment (or build-confirm for POM) with a process in place to ensure that this level of performance could be sustained.
- **Delivery Performance > 95 percent to promise, > 80 to request**, shifting a philosophy from "delivery when we say we can" to delivery when the customer requests it."
- **Quality < 7,500 Parts Per Million**, measuring outgoing product quality in terms of customers' expectations and standards.
- **Total Cost 93 percent of FY 86**, continuous improvement of overall real cost (material, labor, overhead, etc.) achieve a seven percent reduction on a fiscal '86 base.
- **Inventory Turns 5.0 times**, within six months a run-rate turning inventory an average of five times per year.
- **Time to Market < 15 Days**, measured from day-of-submission from engineering to operations to release date.
- **Service**, standards jointly developed among software product services, software products group and the manufacturing business unit through customer input. Then the company developed a performance measurement system to track and report progress toward these ambitious goals. Base-line readings were taken in November 1985, and improvement was rapid, as indicated on the following 1986 consolidated report card.

Consolidated Report Card

		Nov85	Mar86	Jun86	Sept86	Dec86
1.	Class A MRP II	D- (51%)	B (84%)	A (93%)	A (95%)	A+ (97%)
2.	Order Turnaround Time	18 days	10 days	10 days	10 days	7.6 days
3.	Delivery Performance (Wkly)	26%	90%	92%	95%	96%
4.	Order Backlog (Orders)	11,000	466	486	191	269
5.	POM Performance (Slips)	325	0	0	1	1
6.	Direct Ship Performance	72%	94%	89%	95%	95%
7.	New Products released on schedule (Wkly)	40%	95%	100%	100%	100 %
8.	Shortage Area (Orders)	4,800	271	570	220	174
9.	Vendor Delivery Performance	31%	81%	98%	94%	96%
10.	Inventory Record Accuracy	87%	91%	98%	96%	98%
11.	Customer Service Posture	Fire Fighter	Maytag Repairman	Minimum Class A	Class A	Class A
12.	Morale Rotten	Positive	Good	Better	Even Better	

What a difference a year makes! One year before, the company was deluged with customers' complaints. By December 1986, the company was flooded with requests from customers and other companies wanting to visit and find out what was going on. Awards were bestowed on it for delivery, customer service and leadership.

Ever since, this manufacturer has continued racking up successes and is widely acknowledged as a World Class company. Performance measurement works because people respond to clearly communicated goals and evidence of progress.

But the real improvements begin with you. What are your ideas for improving your business? What are your other company team members' ideas for improving your business?

What are you waiting for?
Take some initiative, get them implemented and begin the journey to World Class today!■

How It Works

The best way to move toward World Class is to introduce these measurements selectively, first adopting the few that your assessment reveals are current priorities for your company, product and operational method-priorities that will bring the quickest payback in improvement.

For example, a valve manufacturer with $25 million in sales that was operating both job shop and repetitive environments. The assessment of the company identified that the company's first goal should be to establish structured flow lines in both areas of the business.

The company began by doing baseline studies on each of the six performance measurements to set a benchmark for tracking improvement. Then it focused on the four key measurements identified as most important to improving the business: *cycle time, inventory turns, quality rejects* and *floor space*.

In the following months, the entire company concentrated on improving these four areas as well as maintaining its Class A performance record. Progress, posted prominently for everyone in the company to track on performance report cards, was dramatic (*Figure 2*).

Figure 2

VALVE MANUFACTURER'S PERFORMANCE REPORT CARD
CASE HISTORY

	BASELINE	____ MONTHS	____ MONTHS
Cycle time	18 Weeks	6 Weeks	1 Week
Inventory turns	4	8	48
Rejects	15%	5%	.2%
Quality	85%	95%	99.8%
Floor Space	800 Sq. Ft.	400 Sq. Ft.	80 Sq. Ft.

Aside from quality, which is targeted for all companies at 100 percent, other goals on key measurements must be established relative to the company's resources, its products and operational methods.

Within six months, the company successfully converted to structured flow manufacturing and reduced floor space, cycle times and rejects while increasing inventory turns. Ultimately, the valve manufacturer was able to add the other two performance goals employee suggestions and

employee output. As the results of the education program, the people management system, began to catch up with the more rapid changes in the technology and business management systems. Balance was restored and the company has shifted from a small, Midwestern valve shop to a highly profitable World Class competitor-a World Class company.

The World Class Challenge

In this series of three articles, we have given you a look inside the process of Going for the Globe-World Class Manufacturing Performance. Assessment charts the course, waste elimination clears the way, and performance measurement reports the progress.

How much progress has your company made toward achieving manufacturing excellence? Have you conducted an assessment? Are you targeting waste? Do you use performance measurements to communicate your standards and goals throughout your company?

If not, are you ready for change? Because for American manufacturers, World Class status means change. It means new awareness, both to its own work processes and those being used throughout its industry here and elsewhere in the world. And it means a new commitment to continuous improvement because World Class manufacturing performance is a constantly moving target. Just like the global markets, competition is always forging ahead.