TRANSITIONING TO "LEAN"

Top Management Implications

"Even If You're on The Right Track,

You'll Get Run Over If You Just Sit There!

Will Rodgers

What Is Lean Manufacturing?

While there are a whole set of techniques and related disciplines, the general concept of "Lean" is that of **continuous product flow**, without interruption, through the entire value stream. Inventory is seen as an equivalent to cycle time (the more inventory, the longer any one item must wait for "its turn"). An underlying philosophy is that the **reduction of cycle times and inventories** will force waste to be exposed, and create the urgency for its elimination (see the classical "water & rocks" analogy on the back cover).

Waste is re-defined as "anything that does not add value… from the customer's perspective".

The results of a successful transformation to this powerful operating philosophy can be staggering. Huge reductions in inventory and cycle times. Order of magnitude improvements in quality. Dramatic productivity gains.

Now is the time to begin your journey to World Class!

Transitioning to Lean: Core Beliefs

- **The Process Begins At The Top:** It is critical that top management understands the Lean concepts and implications up front. They must set the top-level expectations, and revise the reward systems accordingly.
- **Goals Drive the Process:** Goal curves force the Continuous Improvement Process. A consistent set of goals unifies priorities and direction. Top level goals are supported by division, plant, department, and work

center goals. They must be commitments. People must be held accountable.

- **Customer Focused:** Every customer wants low Cost, high Quality, short Lead-Time, and On-Time every time. All education, and each initiative, should be focused on improving at least one of these four aspects of customer service.
- **Just Do It!** Results beget results. Try something. If it works, do more of it. If it doesn't, try something else!
- **Do The "Easy Stuff" First:** Get the immediate bang for the buck. Quick results generate momentum and furnish the cash needed to solve some of the more difficult problems. *Do what you can, with what you've got, where you're at, right now!*
- **Iterative education:** Provide people with enough tools to get started. Put that education to work immediately. Make something happen. Then, teach the applicable solution techniques when a problem arises, i.e. utilize the "teachable moment".

Top Management Implications

The philosophy, mechanics, and tremendous outcomes of "Lean Manufacturing" are well documented.
What isn't well documented are the subtleties, the "implications", and their impact on top management.
Over the last fourteen years of working with all types of manufacturing companies, in a myriad of industries, a set of top management issues continued to pop up. These are the major management inhibitors, the "gotcha's" that you will likely encounter. Additionally, some management "tricks" and tools were discovered. These will also be included for your consideration.

It is the purpose of this booklet to forewarn you, as well as provide you with some recommended solutions.

Profit Impact: During the initial stages of conversion to World Class practices, major changes occur in inventories. These inventory changes are what cause the anomaly in accounting profits. The profit impact is typically **negative**. The aberration is caused by labor variance, and the associated absorption of overhead (to reduce inventory you must, for some period of time, produce less than you ship).
Note: while the profit measurement looks worse, overall company well-being is substantially enhanced! Cash flow is up, often dramatically, and major inroads are being made in customer service, product quality, and costs. A proforma should be done by the CFO to quantify the impact, and get buy-in at the onset.
Note: Occasionally companies experience an artificial profit increase due to exposed FIFI or LIFO layers.

Performance Measurements: People will perform so as to maximize their measurement. Most traditional measurements encourage the **wrong** behavior. This is particularly true when attempting to transition to World-Class practices. Volume related measurements encourage the production of "something" whether it is needed or not! "Performance against standard" can be totally misleading, particularly if the standards are "adjusted" (doing so can destroy the baseline for comparison).
Another issue is the appropriateness of the measurement for the person or group being measured, (e.g. holding manufacturing accountable for shipping to a sales plan, regardless of whether or not the plan was actually sold!).

Optimize the Whole: Another measurement problem is the traditional focus on optimizing each operation, instead of the total plant. To optimize the "whole" we will typically, at least temporarily, sub-optimize some of the "pieces". Expect

it! Note that bottleneck operations must be treated differently than non-bottleneck operations. Since in-process inventory levels correlate directly with cycle time through the factory, WIP must be minimized. Since you'll want some "just-in-case" inventory in front of the bottlenecks, little or no inventory can be allowed in front of non-bottleneck operations. The net effect is that some of the departmental measurements will look worse, while at the same time, the overall company measurements improve.

Accountability: Operating "Lean" increases the need for clear responsibilities. Action items, with realistic internal promise dates, will be required to achieve the established goal curves. People must be held accountable to achieving these promises. Continually ask "Who?" "By when?" Once a reasonable commitment is made, the focus must switch to "How to achieve the date", not "If it will be accomplished"!

Performance Objectives: What are the performance parameters critical to the continued health and prosperity of your company? How will you measure these parameters? What are your goals in terms of performance on these parameters? By what date should these levels be attained? We believe strongly in goal curves. Draw a straight line from your current performance to the target performance and due date. Plotting "actuals" against this curve provides a continual scorecard. When you fall behind the curve in any period, "cause and corrective actions" must be required. Continuous monitoring provides top management a means to force continuous improvement.
Critical parameters will include (at minimum): Promises kept (percent on-time delivery); Quality (at the customer site); Cycle/lead time (equals inventory); and Productivity.
Note: To make sure that the "low hanging fruit" is gotten quickly, set the initial goals aggressively and with a short time horizon (3-6 months).

Idle Time and Overtime: By linking manufacturing steps together through kanbans (the pull system), the production process begins to take on the characteristics of an assembly line. And, as in any assembly line, when any manufacturing step shuts down, all operations shut down. Since the schedule must be met, every shift, each hour of idle time will typically demand an hour of overtime to recover. Avoid the temptation to "just work the one area over" and let the rest of the operations go home. Inventory will quickly refill the plant, and lead times will balloon!

Slow Down the Machine: A basic philosophy of Cycle Time Reduction is the concept of continuous flow. The idea is to produce product at the same rate that your internal customer (the next operation) uses it. If your internal customer needs 1000 units/hr, and your machine is capable of running 2000/hr, we would want to slow the supplying machine to 1000 units/hr (that's all your customer needs). This is "heresy" in many traditional cultures!

Temporary Reduction of Sales: Long lead times and unreliable deliveries generally force your customers to carry a certain amount of "just in case" inventory (safety stocks, lot sizes, safety time by ordering early, etc.). As you, the supplier, get more reliable and reduce your lead times, your customers no longer require as much "pad".
Inventory reduction at your customer's site will temporarily result in reduced requirements (they'll need less material delivered while they are using up their excess inventory). You will need to work closely with your customers to minimize this impact. You'll also need to be aware that the capacity freed up during this period is a temporary situation. Don't make long-term commitments for its disposal!

Non-Traditional Work Hours: Most process industries have always operated seven days, 24 hrs/day. In many "discrete product" industries this has not been the case. Shortening

lead times may force you to think "outside the box", i.e. seven day/week operations, moving salaried employees to the off shifts, etc. One often-overlooked opportunity is available to companies currently running on one shift. By moving half of the workforce to a second shift, you can cut your product cycle times in half. The easiest way to explain this phenomenon is through an example. If a product goes through six sequential operations, and each operation requires eight hours of process time, what is it's minimum lead-time (in days) on a one-shift basis? It's six days. Now, what's the minimum lead-time if I'm on a two-shift basis? Now it's only three days. Operation 1 is done on day one, first shift. Operation 2 is done on day one, second shift, etc. Note that we have not added any people. We've simply moved half of the people to the off-shift. We have not increased capacity (the same number of people, doing the same amount of work). But we have cut lead-time and work-in-process inventory in half. A similar effect takes place regardless of the processing times and number of steps. Note: If you are currently running three shifts, five days/week, a comparable opportunity exists. Spreading the same number of total man-hours over 7 days/week from a traditional 5 day work-week can cut cycle times by up to 28% (and provide daily schedule recovery capability).

Hiring for the off-shifts: In a tight labor market, some non-conventional thinking is generally required to entice people to work the "off" shifts. Be creative: Four day, 10 hr shifts: Push the 2nd shift start time to 8:00 PM (so the employees can have dinner with the family); Offer a "3rd" shift that works the weekend, Fri Sat Sun 11 or 12 hours/day; etc.

Schedule Commitment: As you remove the "slop" in terms of excess lead times, the impact of not meeting an internal schedule date begins to affect the external customer. Thus, the schedule must be met "every shift, every day" in all

areas. To accomplish this, "Under capacity scheduling" is required. This can be achieved by building recovery time into the manufacturing and the crewing schedule (i.e. by loading less than demonstrated capacity) or, if less than three shifts are used, through the use of overtime: "The shift ends when the schedule is finished".
Note: Schedule accountability is a critical first discipline required for successful transition to a lean operation.

The "Program Du Jour" Syndrome: The impact and ROI of transitioning to "Lean" is huge. The conversion process can generate tremendous cash and competitive advantages, and in a hurry! It is, however, very easy to lose focus prior to reaping the biggest benefits, and more importantly, before the process is truly **institutionalized**. Top management must keep this process in front of the troops as "The most important thing going on in the company".
Company-wide goal curves are used to retain this focus. This is also the reason why SPEED of transition is critical. Make something significant happen A.S.A.P. Then keep things moving by setting stretch goals and continuously monitoring progress. If you don't, enthusiasm will wane and people will get sidetracked.
Also: Beware the "new manager" syndrome. The new guy will see the Lean initiatives as someone else's program and look for his/her own initiatives. *When a new male lion takes over the pride, he kills all of his predecessor's cubs!*

Volume Discounts: Many companies have a price list which allows discounts for ordering large quantities at one time, i.e. "column pricing". World Class companies overtly try to linearize their production. This calls for small runs and frequent deliveries. Pricing should be based on annual volume (long term contracts). Not on the quantity per buy.

Employee Involvement: Continuously inform all employees as to what the company is trying to accomplish and why.

The Cycle Time Reduction process will automatically create quasi "teams" by forming product-focused cells, and/or linking operators together through kanban or equivalent systems. Then, when a structured process improvement blitz is done in their area, some or all employees will become part of a more formal "natural work team" focused on achieving their own set of goals. This is the ideal time to provide iterative operator training in participative management, problem solving, consensus building, etc.

Make-To-Order: Much faster cycle times allow companies to consider making the transition from "Make-To-Stock/Forecast" to "Assemble-To-Order" to "Make-To-Order". What impact would it have on your company to be the first?

Lead Time Philosophy: Many traditional American companies operate with a "floating" lead time (backlog); Call in June, the lead time is 3 weeks; Call in August and the lead time is 6 weeks; etc. Most World Class companies operate with **FIXED** lead times. The lead-time not only is dramatically less than traditional suppliers. It is constant. Needless to say, operating with the latter philosophy has major implications on how you structure the organization, staffing policies, flexibility, and in general, conduct business. Keep in mind that it isn't mandatory to have fixed lead times for all customers. Start with the "A" customers and go from there.

Rate of Propagation: Transitioning to lean typically increases the workload for manufacturing engineering (quick set-up, improved tooling, failsafe fixturing), maintenance (quicker response when machines go down, improved preventative maintenance to keep machines from shutting down), and purchasing (vendor base reduction, supplier development, partnering). The rate of implementation of these concepts is normally paced by the ability to support

this transition by the effected organizations.
Look at providing contract help and possibly utilizing some of the freed-up resources from other departments. You may also want to begin a mentoring / training program.

Premature "Selling" of the Benefits: The sales force must be educated on lean manufacturing concepts, and the potential benefits to the customer. However, it is critical that these "benefits" are not promised to customers before the capability has been demonstrated, and sustained, in operations. Carefully worded direct mail to key customers can let them know "something good" is coming, without over-committing.

Multiplier Effect: Inventory in the supply chain (e.g. retailer, wholesaler, distributor, original equipment manufacturer, sub-assembly supplier, component part supplier, raw material supplier) compounds the impact of a top-level demand change. A small change in demand at the retail level results in a greater change at each lower tier due to inventory adjustments (the "boom – bust" syndrome). The amount of distortion is proportional to the amount of inventory throughout the supply chain.
Work to minimize the inventory of your product at all levels of the supply chain above. Start by cutting your cycle times and getting reliable! Reduce inventory at your customer's site through partnering agreements, vendor managed inventory, etc. Track retail sales levels of items that use your products. Seek to understand the cause for each volume change. How much is a "real" change in consumer demand, and what portion is caused by inventory adjustments?

Price Change Announcement: Some companies have a history of pre-announcing price changes. Doing so can cause a feast/famine cycle of order rates as customers place orders early to avoid the increase, or delay the order to take advantage of the pending decrease. World Class companies

are always seeking ways to smooth the order rate and therefore avoid hinting of any price change, up or down, prior to its immediate implementation.

Order Promising and Capacity Control: Reliable delivery performance begins with credible promising. Over-booking is one of the major inhibitors to good customer service. In nine out of ten cases, this is **not** a systems problem. It's a discipline issue. Top management must take an active role in "controlling the book" by involvement in top level sales and operations planning. Capacity "valves" must be put in place. Utilize an overbooked situation to "prune" your customer base. Profits will soar and service levels, for the remaining customers, will continue to be "world class".

Activity Based Costing: Traditional cost accounting can be misleading in terms of true product costs. We suggest that you do a thumbnail ABC early in your Lean transition process. Make a reasonable re-allocation of overhead. Then re-assess your product costs a couple times per year. A perpetual ABC costing function may not be required.
Note: Costs attributable to excess capacity should be charged to a general "capacity" account, and **not** spread across current products. Applying the costs to current products will only further distort true product costs and contribution.
As you begin to leverage the customer benefits of a "Lean" operation, you may find demand outstripping your capacity. Before jumping to add brick & mortar, take a hard look at true product costs, and contribution by product line and by customer. Profitability can often be significantly improved by adjusting prices, "weaning" product lines, and eliminating marginal customers.

Systems Impact: The transition to "Lean" typically reduces a company's dependence upon formal manufacturing computer systems. Shorter lead times and increased agility reduce the need for extensive forecasting tools. Kanban

controls, short manufacturing cycle times, and low work-in-process inventory levels reduce or eliminate the need for shop floor control tracking and statusing. Point-of-use stocking minimizes the use of pick-lists and cycle counting reports.
Note: "Lean" techniques create small lot sizes, short lead times, and flat bills of material. While these attributes greatly enhance the accuracy of ERP system information, they also dramatically reduce the complexity of the software required. Many Lean companies do all of their shop scheduling, and even capacity planning, using very simple MRP software. Some do it on spreadsheets.

Funding for Consultants: Each manufacturing company makes the transition to "Lean" only once. You'll need someone to guide you. It is important that the funding for your mentor/s be done at the corporate level, and not billed to the individual operating units. Corporate level funding encourages the operating units to seek help to achieve their goals. By billing the operating units, they invariably cut-off help prematurely. This not only shortchanges many of the benefits, but worse yet, fails to truly institutionalize the process, allowing it to slowly drift back to "business as usual".

In-House Facilitators: To get the most out of your outside change agents, you'll want to name one or two of your best people to become the in-house Gurus. Their role is to become completely versed in both the concepts of "Lean" manufacturing, as well as the transition methodology. They should be "glued to the side" of your consultants.
The ideal internal facilitator is a high level, well-respected staff member. He or she should report directly to the CEO. One additional facilitator responsibility is to keep the CEO abreast of progress: Who deserves a pat on the back? And who needs to be prodded?

Make – Buy Decisions: Ask these questions: What is this supplier going to do that we couldn't do (besides adding his own profit, packaging costs, and transportation costs)? What happens to our overall profitability if this product is out-sourced and the additional volume is no longer available to offset the fixed costs of running the business?

Productivity Gains: Changing from a traditional operation to "Lean" can generate huge productivity gains. Management must anticipate the impact of these gains and the resulting impact on their workforce. The ideal solution is to absorb these gains through rapid growth in sales. However, when this alternative does not appear likely, planning for, and taking the appropriate action, BEFORE beginning the transition, is extremely important.
A significant portion of the power of "Lean" is attained through empowering the workforce. The people on the floor are the true experts and can dramatically reduce waste when appropriately challenged. No one, however, is going to aggressively cut costs if it means they risk losing their job as a result. Assurances need to me made. If a reduction of force is anticipated, it should be done in advance of beginning the "Lean" conversion. Then provide the remaining workforce job assurances to move forward. Additional alternatives include: Getting rid of deadwood. Delaying hiring. Reducing the number of temporary workers. Cutting over-time. Promoting attrition through early retirement programs. Moving people to sales and/or new product development. Changing some "buy" items to "make". Forming a "Lean Team" to help expand the gains internally, and assist suppliers/customers make the transition.

Just Do It! There are a myriad of forces out there, all of which will attempt to slow the process and protect the "status quo." Top management must be continuously pushing for rapid improvement. "Make something happen... Now!"

CAN I BORROW YOUR WATCH?

Consultants have a bad reputation. Sadly, in many cases the "rap" is justified. We're different. Let me explain why.

1. The typical consulting assignment is met with a bevy of young recent MBA's. They call it a "task force".
   For any one client-site, our typical task force is composed of a few seasoned individuals.
2. Their task force is assigned to a nearly full time effort.
   Our normal process involves spaced visits of about four days each. We teach **your** people how to do it, and assist with the initial efforts; we do not do it for you.
3. They identify a set of "deliverables". These are usually composed of a "report" and/or some software.
   We don't do reports or create software. Our only deliverable is the achievement of the tangible goals set by our clients. These goals generally include: Significant reduction of **inventory** and **cycle time**; greatly improved **on-time delivery**; quantum reductions in **costs**; and improved **quality**.
4. The consulting "project" is often seen as a temporary anomaly. "It'll be 'business as usual' in a few months".
   Our Rapid Impact process causes permanent culture change, i.e. Creates a new way of doing business that consistently produces World Class results.
5. It can be difficult, if not impossible, to tell what, if any, results actually came from the effort.
   In most industries, our Rapid Impact process produces significant, measurable results by the end of the SECOND WEEK! And, we **guarantee the results**! We offer a simple, mutually agreed upon set of deliverables. We will attain or exceed these objectives, in the budgeted time, or we will stay until they are met… at no additional charge. Our ROI's average well in excess of 500%!

The Hands-On Group

Let's take a look at some actual client results attained **within the first three months**, some from the first visit!

- **Medical Equipment**: Three weeks taken out of lead times. $1.7 million inventory reduction. 60% reduction in defects. On-time completion's went from virtually "never" to a consistent 100%! Huge productivity gains.
- **Defense Contractor**: Two week lead time cut to one day. 50% space reduction. Rejects cut in half. 100% daily schedule attainment. Complex scheduling system replaced with simple kanban controls.
- **Industrial Fuses**: Six day lead time cut to one. 40% space reduction. 75% inventory reduction. 100% daily schedule attainment.
- **Electric Motors**: Two week lead time cut to three days. $175,000 inventory reduction. 30% space reduction. Complex scheduling system replaced with a simple pull.

"I hate consultants;
But I'd recommend you guys to anyone."
Larry Furguson, General Manager, GE Transformers

The Hands-On Group

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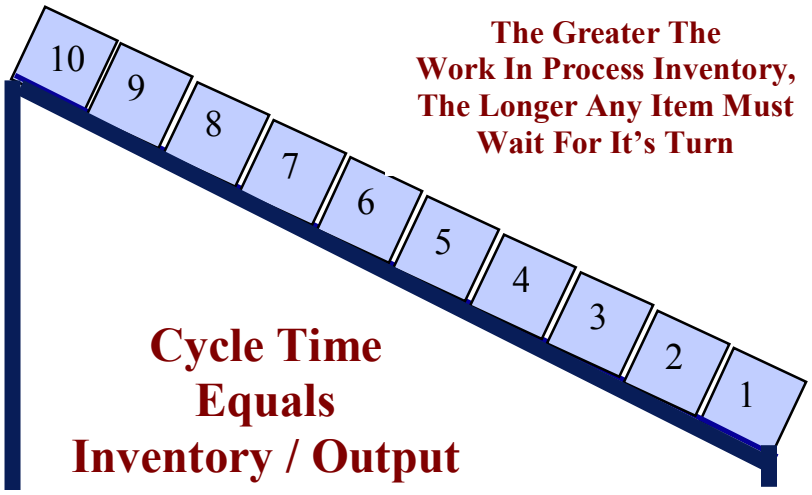
Each manufacturing company makes the transition to Lean but once. Whether you use the Hands-On Group, or someone else, get some help. Experience is a powerful teacher!
Call to set up a risk-free assessment.

Inventory Hides Waste!

Reducing Inventory Exposes the Waste and Forces Correction.

The Water Represents Inventory.

The Rocks Represent Waste.



The Greater The Work In Process Inventory, The Longer Any Item Must Wait For It's Turn

Cycle Time Equals Inventory / Output