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The Lean Manufacturing Advisor

Lockheed Martin and suppliers establish a timetable and goals for the first three improvement events. "This is not a science project," said Walters. "This is about continuous improvement. It's about getting results and it's about celebrating the success of those results."

The champions at the supplier companies are responsible for implementing the lean conversion plan. Material Management reviews progress weekly.

So far, kaikaku or kaizen events have been done with 18 major suppliers. Another 20 major suppliers and 50 smaller suppliers will host events this year.

After Lockheed Martin facilitates the baseline assessment and the first three improvement events, the supplier who has received the assistance still has a strong incentive to continue the lean effort. Suppliers had to describe how they were going to sustain lean activities in the conversion plans submitted after the conference last September. And they have price targets to meet in the MOA.

"The expectation is we will set a reduction target to be achieved over the life" of existing contracts with suppliers, explained Walters. And when Lockheed Martin is ready to make the next round of purchases from suppliers, it expects to see improvements in costs, cycle times, and quality reflected in the price. ■

Thought for the Month

A boy of about 10 jostles a stranger in a crowded store. His mother – mortified – apologized to the stranger, took the boy firmly by the shoulders, pushed him backwards into his sister, and shouted, "no shoving!"

"Talk about mixed messages," commented another shopper. But the message was really quite straightforward. "Those who can, shove."

How often is this story played out on the job? A mission statement touts opportunity in a company with a segregated board room. A corporate video preaches innovation in an organization that rewards conformity. … In the final analysis, there are no "mixed messages." The culture will win every time.

– Sarita Chawla and John Renesch, editors, *Learning Organizations*, Productivity (800 394-6868) p.465

The Psychology of Change

What follows is the second in our series on the critical but neglected issue of change management. It was written by George Koenigsaecker, who spent 15 years leading companies to lean production, first as president of Jacobs Vehicle Systems Company (Jake Brake) and later as a group vice president of Jake's parent company Danaher Corp. There he created the Danaher Business System, based on the Toyota Production System. As president of The HON Company, the largest unit of HON Industries, Koenigsaecker developed the company's successful lean effort, called Rapid Continuous Improvement. He now is a principal in Lean Investments, LLC, a new investment company focused on investing in companies and then beginning lean transformations.

By George Koenigsaecker

To understand what will happen to people mentally and emotionally during the lean conversion process it is important to keep in mind the magnitude of the change effort. Lean is a total organizational change. As we showed last month, businesses can expect a 100 percent productivity gain when they start the conversion process from a Ford-style system (flow in final assembly, but primarily batch production of parts). That means lean will trigger a 100 percent change in all company processes. All the jobs that your organization performs day-to-day will change.

If you are a batch producer, you have the potential for a 400 percent productivity gain. You will totally reengineer all your processes, in every department, twice. In other words, lean will double your productivity and then double it again.

It is key to realize that you must reengineer all your salaried or administrative processes, as well as all your shop-floor processes, to completely garner such large gains. Most companies do not get all the benefits of a true lean conversion because they don't address these white-collar areas. They see benefits from transforming the shop processes, but generally two-thirds of your costs are in white-collar areas. A relatively successful conversion may only reap about 70 percent of the potential shop-floor gains, but virtually none of the white-collar improvements. So, in total, it collects only about 20 percent of the potential benefits.

In fact, to really get and hold the benefits of flow production you must transition your organization from a functional structure to a product focused, cross-functional structure. (I'll share more about the organizational and structural changes needed to take full advantage of a lean conversion in part three of this series.) But here are a few examples of the kinds of changes that are typical of a fully successful lean conversion:

- If you are a batch producer, your operators will move from sitting in a chair at one machine ("My machine," as

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they will tell you), to walking as they operate multiple types of machines in a cell. When you convert to flow cells, it is normal for operators to say, "I lost my job." But they are not unemployed. Rather, they lost the job they did for 20 years and the comfort of its very familiar routine.

- As you introduce flow production into your operations you will have to work around "monuments," the mega-sized pieces of equipment such as curing ovens, chemical baths, or paint lines that operate with big batches. You will need some type of kanban system to connect flow operations on either side of the monument. As a result, your traditional production control department (the place where I started my manufacturing career at Deere and Co.) disappears. Even as production control assumes management of the kanban system, many schedulers and expediters won't have their traditional work to do. Most people will not come up to you and volunteer to eliminate their position. As a change manager, you will have to "make this happen." You must consider how to redeploy the members of this area and others affected by the conversion into more value-added work. (I'll explore some of your options in the next article.)

- As processes add poka-yoke (mistake proofing) devices and associates begin inspecting work within operations, your quality department will shrink. (Shigeo Shingo called these in-process inspections self-checks and successive checks.) Most of the work in quality departments is in the inspection function. As this moves to shop operations, the intellectual part of quality control is left. This includes teaching associates about quality tools, coaching them in problem solving, leading problem solving teams on key issues, etc. The department size should shrink by about 90 percent over the six-to-10 years of a lean conversion. But it won't shrink on its own. You will have to manage it downward, too.

- In a lean conversion, you will drop 80-to-90 percent of current vendors because they are unable or unwilling to adopt lean practices. It is absolutely necessary to pare back the vendor base. Vendors who cannot commit to the conversion will never be capable of meeting your goals. And besides, it is tough to get to the root cause of a quality problem with a purchased part if there are three suppliers delivering the same part. You might reduce the number of casting vendors to two, but they will be sourced by part number. If there is a quality issue, you will know who to contact. Your purchasing department must identify that 10 percent of vendors willing to commit to continuous improvement and use the prospect of more business as leverage to make them get serious about converting. You will have to lend support to the lean efforts at the remaining vendors. But most purchasing departments have 90 percent of their associates doing expediting. As purchasing shifts from expediting to strategic vendor selection, processing blanket purchase orders, and supporting the lean conversion of the supply chain, it will need about 10 percent of the associates who worked in the old purchasing function.

- And just to make the conversion process really interesting, consider that many of the most successful lean conversion efforts moved cross-functional support teams out to the shop floor where they could be close to the new product-family production cells. This will cause anxiety among professional and technical people worried about status and authority. You will have to create new centers of prestige and authority, and new role models. People who have prestige in the existing system, don't want to give it up.

These are not small changes. The only business endeavor coming close in magnitude to the transformation of U.S. companies to lean was the conversion of peacetime manufacturing to war production at the start of World War II. Most associates joined the armed forces. New ones had to be trained. They had to learn new processes to make the new military products. Managers back then had a big advantage. We were at war; everyone knew the changes had to happen. You won't have that kind of advantage with lean change management issues.

Most of the key principles of lean are intellectually straightforward. Take one-piece flow. The idea is to make one part, move one part. It is not hard to understand. But all of us in manufacturing were trained in environments where products of varying sizes were always piled between operations. In our "gut," we knew they concealed problems. But when we try to actually change to one-piece flow, it scares everyone -- managers and shop-floor associates.

Learning and Unlearning

The design of lean tools adds a special dimension to the conversion process. Most were designed to "uncover the waste." That means they surface all the problems associated with poor setup, poor machine maintenance, poor scheduling, etc. They usually surface waste by stopping the offending operation in its tracks. Be ready to respond quickly with the appropriate lean tool to solve the problem. This might sound like a painful process, but it's the way the system was designed. And it is a change management issue that sinks many conversions.

When Toyota established operations in the U.S., it did not try to hire many associates with prior manufacturing experience. As Toyota noted, it takes a great effort for associates to "unlearn" old methods before they can learn the new lean ones. They knew it would be easier to just teach new associates the right way, rather than have them unlearn the old way and learn the new way.

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Unfortunately, those of us who are in "brownfield" operations don't have this choice. We must tear down old ways, while teaching people a new set of key ideas about how to run an operation. The tearing down and teaching happens through the week-long kaizen event. The kaizen event structure of mapping processes to identify waste, looking at takt times, and rapidly applying lean tools to make improvements works well in white-collar areas, too. It's the key tool for changing the thought processes.

From my personal experience guiding lean conversions at single-plant operations and also multi-site operations, I have developed some rules of thumb about the lean learning curve. The first one is that you don't learn lean in the classroom. You only learn it by taking the principles into your operation and struggling to apply them.

I've found that it takes good associates about 12 total weeks of experience in kaizen events before they can serve on a kaizen team without making significant implementation mistakes. They need about 36 weeks of experience to become good at using most of the tools. And it takes the best associates about 48 weeks of experience to really believe that the tools work and to use them consistently without outside encouragement. Assuming you can do a week-long kaizen each month, you are looking at a four-year learning curve. The length of this curve is why most successful lean conversions use an outside experienced "sensei" during at least the first three years of their conversion.

Don't be discouraged by the length of the learning curve. Time becomes a competitive advantage when your organization is the one that starts on the conversion journey first. As Mr. Iwata, the president of Shingijutsu, my original sensei said, "I bet I can show you how to do this, but I bet you still cannot do it!" His point: you must learn lean by working at applying lean. There are no short cuts.

Mourning and Healing

Psychologists have noted that most people do not embrace change, even if the change will ultimately be good for them. Initially, change is just something new, an unwanted interruption to the routine of their lives.

As a rule of thumb, psychologists calculate that it takes somewhere between six and 18 months for someone to adjust to a major change in their life. And as we have seen, the changes launched by lean are major league. So if you are managing this change process, recognize that associates who are still in the six-to-18-month "mourning" period, are not going to be strong supporters of more change.

But the faster you change, the faster you can improve productivity and performance. It's true. But it is also true that the overall organization will reject the change initiative if too many associates are still mourning the loss of the old ways. Even in an aggressive implementation, let no more than 1/3 of the organization experience a major transition within a 12-month period. Remember: The definition of a leader is someone who has followers. So after you have pushed, encouraged, and cajoled – check to see if anybody is joining up.

This change dynamic, when combined with the long learning curve, has another implication for would-be change agents: in the first year or so of the conversion process, you will have to drive it. Don't expect it to be driven from the bottom up.

Remember that no one on your team knows how to do this, no one likes change, and the transformation process takes three to five years to learn and become "comfortable" with. So early on, the change agent must require compliance with lean practices. In other words, it takes an authoritarian style to get this change started.

But it also will not become a self-sustaining cultural change unless everyone is buying in after three to five years of hard work. As a manager, you must constantly assess where individual members of your team are on their personal learning curve. As they really come to believe in the lean practices, you become their coach by stepping out of the way, except to help remove roadblocks.

A word of caution: believers may become intolerant of waste and have difficulty working with "nonbelievers." It makes your job as a manager or executive even more interesting. Just remember that there is a lean conversion process for the organization as a whole, and a separate one for each associate. Thus, at any point in time, you will be pushing some associates and coaching others. The successful change agent exhibits both authoritarian and involvement styles of management at the same time. It's not an easy task.

One way to think about change comes from an analogy by Fujio Cho, former head of Toyota Manufacturing U.S.A. and now president of Toyota Motor in Japan. He noted that organizations are like the human body. When a change is introduced, the body automatically creates antibodies that attack the change. So when you try something new, expect the organization to attack it. In fact, the stronger the organization's culture, the more aggressively it will produce antibodies, and the more resistant it is to change. Hey, no one said a lean conversion would be easy!

See the accompanying charts for another insight into change. The charts show your associates'attitude toward change as a normal distribution curve. Basically one sigma likes change, one sigma hates change. The 90 percent in the middle are looking for leadership.

Normally, in the U.S. we talk about supporting the small group of associates who like change, the "early adopters" in marketing terms. That's okay.

What's not okay is failing to address the 5 percent of associates in the anti-change faction. If left alone, they will undermine the change effort. They will become a "fifth column," constantly pointing out the risks of the new path. Every time a new kaizen team makes an implementation error, they will point it out. During coffee breaks, they will tell fellow associates, This lean thing is going to kill our company.

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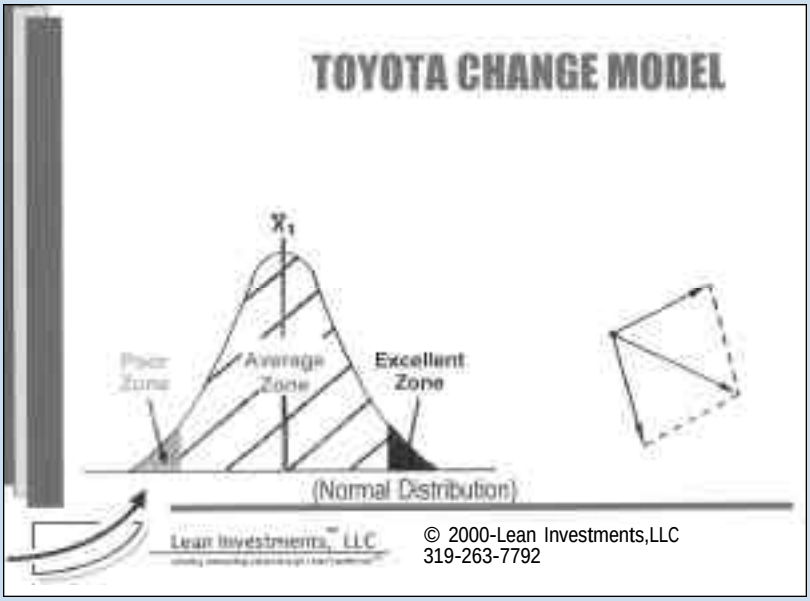
The anti-change folks will include some of your most respected associates and most senior managers. They liked things the way they were. The problem is that the 90 percent in the middle, who are looking for leadership, will be very confused. They will hear opposite messages from two respected groups of fellow associates.

The second chart shows what you must do. If you remove the anti-change faction from active contact with the rest of the organization, the 90 percent in the middle will shift toward the new direction. The small leadership contingent will get the whole organization moving toward lean.

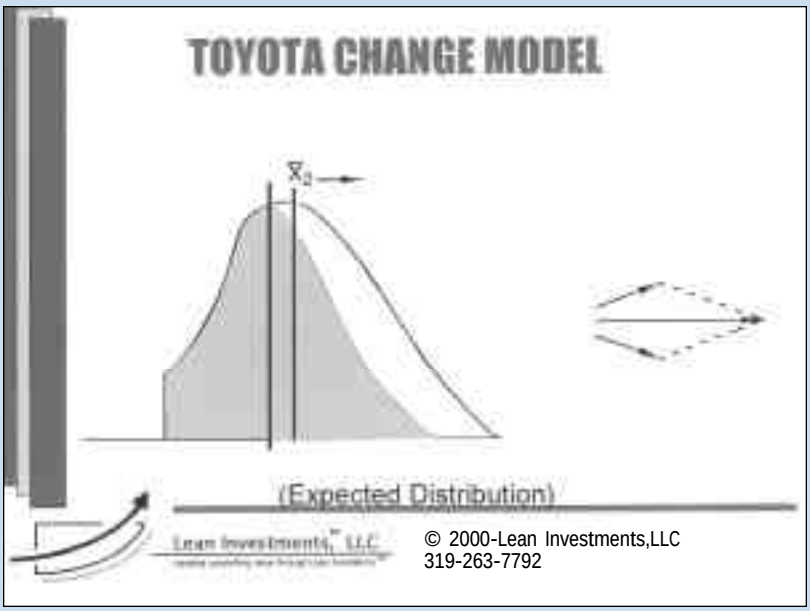
There are a variety of ways to accomplish this "removal of contact with the rest of the organization." Japanese lifetime employment companies had ways to address people who refused to get on board. For instance, a company might have someone stay in his office with no phone or organizational contact until he "got it."

Here, it is better to identify the key anti-change players and offer them a chance to join up. If they do not think they can adapt to a lean environment, offer to help them "find another team." It is important to note, that <u>failure to address the anti-change faction is the most common reason why lean conversions fail.</u> WWII bomber pilots used to say that you get the most flak when you are directly over the target. Keep it in mind when targeting your anti-change forces.

Do you have examples of change issues and solutions that you would like to discuss? George Koenigsaecker would be interested in hearing about them at gk@simpler.com.



Looking for Leadership –
The normal distribution curve shows 90 percent of associates in the average zone.The 5 percent at the right are supporters of the lean conversion. The 5 percent in the "poor zone" are the anti-change forces.The angle or vector at the right represents how a typical unfocused organization such as this is pulled in several directions because people are receiving conflicting messages from the 5 percent at either extreme.



Moving the Mountain –
This chart illustrates what happens when the anti-change forces (shown as the 5 percent of associates on the left of the curve in the previous chart) are removed from contact with the organization.The 90 percent of associates in the middle get one consistent message. They begin shifting to the right, towards supporting the lean conversion process. The angle or vector shows a more focused organization, heading in the same direction – towards the 5 percent of lean "early adopters" at the right of the curve.