The 30-Inch View

How to connect lean thinking with ergonomics

By Mike Wynn, VP and Ergonomics Engineer, Humantech, Inc.

For many manufacturing and industrial companies, ergonomics remains a pressing issue due to the chronic nature of musculoskeletal injuries and rising medical care costs. At the same time, Lean thinking is being embraced throughout industry to drive substantial gains in production quality and cost. This hopes to address the reasons why ergonomics can be a powerful accelerator of Lean, benefiting both safety managers and production leaders.

Lean Thinking

Lean is often introduced as a tool to "optimize value streams" and "create production flow." This is misleading- Lean is not just a way to organize your production activities; it's a way of improving your entire operation.

Lean thinking requires you to drive waste from every aspect of your operation, every day. It's not a job for people with special skills; it's a job for everyone in your organization. Fundamentally, Lean thinking is built on the basis of continuous improvement.

Continuous improvement works when everyone is responsible for identifying and acting on the opportunities for enhancing processes. This is a powerful concept that can result in dramatic progress over time- as long as everyone is striving for the same goals and working together to achieve them.

Small Space, Big Idea

This brings us to the biggest challenge with continuous improvement: engaging shop floor employees in the effort. It's not enough that shop floor employees participate in continuous improvement; the reality is that sustainable gains cannot be achieved unless employees are actively engaged in continuous improvement efforts. Workers on the shop floor have the most exposure to opportunities for improvement. Without their involvement, you will not even know most of these opportunities exist.

This is what Humantech refers to as the 30-Inch View. Lean thinking starts at the intersection between people and their work environment, the 30-inch area around them where they reach, handle tools and objects, view things, and add value to products.

When everyone on the shop floor is tasked with finding and fixing something every

day, you are leveraging your continuous improvement effort over your entire plant population and the 220 days that people work in a year. This is how Toyota continues to implement over one million improvements each year.

Three Elements

There are significant hurdles to overcome before your efforts can be successful on such a scale. But the good news is that, when implemented correctly, continuous improvement is contagious and becomes self-sustaining.

When the shop floor achieves visible gains on a daily basis, it is motivating and builds teamwork, resulting in even more improvement activities. Shop floor employees drive continuous improvement in numerous organizations in North America, and companies benefit from the effort every day.

A 30-inch view of people and performance- a focus on designing the workplace to fit the capabilities of people- will accelerate your Lean transformation. There are three key elements:

- Recognizing pain and fatigue as barriers to engagement.
- Acknowledging the productivity impact of designing for human performance.
- Establishing shop floor ownership with respectful engagement.

Overcoming The Barrier Of Pain

Ergonomics: The OSHA Approach

According to the OSHA website, in April 2002, Secretary of Labor Elaine L. Chao unveiled a comprehensive approach to ergonomics designed to quickly and effectively address musculoskeletal disorders (MSDs) in the workplace. OSHA developed a four-pronged ergonomics strategy to meet this goal through a combination of industry-specific and task-specific guidelines, outreach, enforcement, and research.

Since the ergonomics strategy was announced, OSHA has made significant progress in each of the four areas of emphasis to reduce ergonomic injuries. Some highlights of OSHA's accomplishments are summarized below.

- OSHA currently has 39 Strategic Partnerships with an emphasis on ergonomics, and 26 national Alliances and 49 Regional/Area Office Alliances with a focus on ergonomics. OSHA works with its Alliance Program participants to provide ergonomic training to employees.
- OSHA's website features eight eTools that address ergonomics for a number of industries and occupations. Through the Alliance Program, its participants are working with the Agency to develop and enhance the tools.
- The OSHA Training Institute Education Centers conducted 35 ergonomic classes in FY2006.
- OSHA's Ergonomics Safety and Health Topics webpage reflects the Agency's four-pronged strategy to reduce ergonomic injuries. The webpage provides information on ergonomic guidelines, enforcement actions, the National Advisory Committee on Ergonomics, eTools, cooperative programs, a library of more than 45 success stories from a variety of industries, and case studies.
- OSHA signed a Memorandum of Understanding with the U.S. Small Business Administration, Office of Advocacy, and the U.S. Small Business Administration, Office of the Small Business and Agriculture Regulatory Enforcement Ombudsman, to distribute ergonomics information to small businesses.

For more information, visit www.osha.gov. *[1]*

Pain and fatigue are a part of the daily experience of many in your workforce. This is the first truth. The second truth is that you can systematically reduce the amount of pain and fatigue that people experience at work by improving workplace design. Together, these two points are immensely important to the ability of your organization to engage workers in a continuous improvement culture.

Jobs that contribute to pain and fatigue are barriers to continuous improvement. It's unlikely you'll be able to get someone who must reach or bend down with a sore back to focus attention on finding and acting on opportunities for improvement. This is not a new concept, but many people aren't aware that a medical basis has been established for it, in both the short and long term.

In the short term, someone who is distracted by pain simply cannot focus on improving anything (except reducing the pain). This is explained by the reticular activating system, the portion of the brain that is the center of motivation. It is a screening system that channels our attention to the most important events happening at any given time so that we can respond more quickly and effectively to priority issues. In general, this is a good thing; we couldn't possibly deal with all sensory inputs at any given time, so we've adapted by suppressing most to focus on a few. However, when the body is in pain, the mind focuses on it, rather than on productive tasks.

Longer-term effects have been studied by researchers looking at the link between work-related musculoskeletal disorders (WMSDs) and worker behaviors. They've discovered that cytokines, a known contributor to depression and malaise, are released into the bloodstream in response to repetitive motion, even before WMSD symptoms are experienced. Animal studies have found that cytokines, produced in response to repetitive motion, caused subjects to self-regulate work behaviors. In other words, people tend to not engage in improvement activities when they don't feel well and their body is telling them to take it easy.

Increasing Productivity With Workplace Design

Barriers to comfort are also barriers to productivity. Every awkward posture or excessive force compromises both comfort and productivity. When the postures and forces are severe enough that they increase ergonomic risk, more often than not they also increase the time necessary to complete the task. That's why ergonomics risk factors are called "time and motion constraints" in Lean jargon.

For example, an assembly job that requires the operator to reach to the floor for parts will require a few more seconds than one in which the parts are delivered within easy reach. A job that requires an assembly to be manually force-fit will require a few more seconds than one in which the assembly can be dropped in place. These seconds saved seem trivial at first, but when you add them up over the entire job cycle and the entire shift, the savings can be dramatic. It's not uncommon for companies to realize 20 to 30 percent improvements in productivity from good ergonomic job design.

There are numerous examples of improving productivity with workplace design. For instance, Dow Corning in Hemlock, MI, redesigned a silicone process area to reduce manual handling requirements by 80 percent. The redesign resulted in a 375 percent increase in productivity, and an annual labor cost savings of $300,000. Barriers to comfort are also barriers to productivity.

Dow Corning is an outstanding example of the productivity potential of improved workplace design. A more typical result comes from Honda's Marysville, OH motorcycle plant. An ergonomics team improved a fender finishing workstation to reduce scrap and wasted motion, cutting cycle time by 50 percent. Ergonomic risk factors are also time and motion constraints.

The Lasting Power Of Respectful Engagement

Most likely, the vast majority of your workforce is smart, well trained, and motivated to do a good job. Humantech ergonomists regularly interview people on the shop floor about their jobs, work-related discomfort, and their understanding of how their jobs can be improved. From this experience we can state with confidence that most workers are surprisingly knowledgeable about their jobs and are, for the most part, motivated to perform well.

So why do continuous improvement initiatives often fail to keep employees engaged? One common reason is a lack of demonstrated respect. The continuous improvement team informs the operators of what is about to happen to them, disrupts their daily routines with shop floor changes in the name of improvement, and assigns the operators the responsibility of figuring out how to make it work. It's no wonder that many "improvements" are reversed soon after the team moves on to their next area.

To be effective, workplace improvements can't be done to people; they must be defined and implemented with the full involvement and cooperation of the operators. Companies are adopting a 30-inch view of continuous improvement to ensure that operators are involved every step of the way- and ergonomics is the toolbox they rely on to make it happen.

When you ask operators to identify opportunities for improving the ergonomics of their jobs, and then invite them to act on the opportunities identified as part of a continuous improvement team, you are treating them as the experts. This respectful engagement is an entirely new experience for many of them. And it has a long-lasting effect. The "Find It and Fix It" mentality continues to other ergonomic issues, and extends to quality, delivery, and cost.

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