

Ergonomics + Lean Manufacturing = Synergy for Workplace Improvements and Performance at Genie Industries

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Introduction

Genie Industries is a major manufacturer of aerial work platforms, which are used all over the world. During the past 42 years, Genie's culture has grown to include team-based, innovative business approaches, including lean manufacturing. Most production operations are in Washington state, but current growth includes new plants elsewhere in the U.S., Asia, and Europe.

In 2007, Genie Industries began a concerted effort to significantly reduce injuries and illnesses in its North American manufacturing facilities. With 40% of these injuries musculoskeletal in nature, improving workplace ergonomics was a key strategy. This session shares the approach, elements, experiences, and lessons learned by Genie Industries while deploying an ergonomic improvement process integrated within a lean manufacturing organization. The purpose is to share the general steps of the ergonomics process, deployment challenges, effective practices, and lessons learned.

In late 2006, after years of exponential growth, Genie Industries took a hard look at its safety performance. The lost time case rate for its Washington manufacturing sites had increased each year from 2004 through 2006, while the total injury and illness rate remained 1.5 times the national average for Genie's industry. The company recognized the need to reduce workplace injuries and illness not only from a business standpoint, but because the organization cared about the well-being of the "Team Members" working for and contributing to Genie's success. Under the direction of senior management, Genie launched three major strategies for improvement: work environment, behavior-based safety, and ergonomics.

Genie began establishing an ergonomics process in 2001, motivated by the Washington State Ergonomics Standard. Safety professionals identified and selected assessment tools, developed education for both Team Members and engineers, and prepared a formal ergonomics program. A reduction in Genie's workforce in late 2001 and 2002, followed by rapid growth in 2004 through 2006, strained the implementation of the ergonomics program. In 2006, management confirmed its commitment to improving workplace ergonomics, with a slightly different approach; to quickly establish a process that added value to the business, and to leverage best practices, the company chose to partner with ergonomics consulting resources outside of the organization. After reviewing several options, the Genie Safety staff and operations managers selected Humantech, a leader in ergonomics and performance, as their partner for this improvement opportunity. Since Genie Industries operates with a lean manufacturing philosophy, Humantech's experience with Toyota was a key factor in their selection.

The Genie Ergonomic Improvement Process

Genie Industries' approach to managing ergonomics was based on elements of programs and processes learned from successful organizations:

- Require commitment, sponsorship, and ownership by top management.
- Drive ergonomics as an engineering discipline with the Safety department.
- Manage improvement as a process, not a program. To ensure success, the improvement process had to be sustainable over time and as organizational and leadership changes occurred.
- Focus on reducing risk factors of work-related musculoskeletal disorders (WMSDs). By focusing on the exposure (risk factors) instead of consequences (WMSDs), plants would proactively identify, anticipate, and prevent losses.
- Work toward a common goal and track progress with metrics so all engineers, managers, and Team Members know their progress.
- Use a data-driven approach. Based on the measured level of exposure to risk factors, plants would determine the location, size, and cause of ergonomic exposures. The proper metrics would ensure the process is driven, maintained, and focused on addressing the most critical needs.
- Identify people, time, and monies to support ESI (Employee Symptom Investigation) teams and fund improvements.
- Leverage existing resources and processes within the organization.
- Manage the identification and reduction of ergonomic risks as a continuous improvement process.
- Pursue engineering controls in the work environment; eliminate or reduce ergonomic risk factors through equipment, process, and tool changes. This better ensures risks are eliminated, is not dependent upon individual work practices and behaviors, and reduces the need for behavioral observation and feedback, and administrative controls.
- Clearly define roles and responsibilities of individuals throughout the organization so that each person knows how he or she is expected to contribute to the success of the program, and whom to turn to for assistance. In addition, roles and responsibilities provide a structure for holding people accountable for results at all levels of the organization.

- Address both tactical and strategic elements. Tactical elements are the actions of identifying and reducing ergonomic risk factors in the workplace. Strategic elements are the activities and steps senior management and leaders must put in place (management system) to support and ensure the ongoing success of the tactical elements.
- Engage, involve, and leverage Team Members. Develop expertise within the organization so that the knowledge and technical abilities supporting ergonomics exist within, and are sustained by, Genie Industries.
- Maintain all records and metrics electronically in a central location to allow access by all involved, and real-time access and sharing of results and plans.
- Communicate progress and results. Regular reporting to, and review by, management of metrics, digital dashboard, and audit results.

The Genie ergonomic improvement process was developed to leverage from existing and familiar elements of the organization's lean improvement process and safety management system. It follows the four steps of the Shewart Cycle (Plan, Do, Check, and Act (PDCA)), the basic model for continuous improvement. The principles of lean manufacturing are based on this model and understood throughout the company. Aligning with existing processes increased the acceptance and understanding of the new ergonomic improvement process, presenting it in a format and language familiar to managers, engineers, and Team Members. All steps and elements were documented to ensure continuity.

The core document is the Ergonomics Process Standard, a common company standard that clearly states what must be in place (requirements), who is responsible (roles and responsibilities), and how progress will be measured (metrics). Genie expects the following elements to be in place at each plant:

- **Plan** – Establish a common goal for improvement and metrics to track process. Establish needed resources including a support infrastructure. Identify and assess tasks for ergonomic risk. Determine the level of exposure to risk.
- **Do** – Control risks and hazards in the workplace. Evaluate new tools and processes for risk.
- **Check** – Validate reduction of risk. Track progress to plans and goals.
- **Act** – Standardize effective controls and review the site process, results, and plans regularly.

In addition, the standard includes specific requirements for maintaining key records of the improvement process, criteria for auditing, and recordkeeping.

Implementing the Process at Plants

Implementing a new process within each plant and across the organization was a big challenge. To improve the chance of success, the process, tools, and approach were first piloted at a few locations in Washington State. The pilot locations selected for different reasons, including high incidence of WMSDs (need to do it), desire of plant management (want to do it), and the type of operations/products (opportunities for improvement).

A four-phase approach was used to prepare each plant and establish the ergonomic improvement process at each location.

- **Phase 1: Establish goal, approach, and common tools.** This phase included designing and documenting the ergonomics process into a standard, selecting and acquiring a common set of assessment and tracking tools, and establishing common measures for tracking progress across all plants. During this phase, workshops were conducted to engage both plant leadership and ergonomics process leads. Together they developed implementation plans for their respective sites.
- **Phase 2: Make tangible and immediate improvements in the workplace.** RAPID™ (Risk and Performance Improvement Deployment) Team Events, based on Kaizen (continuous improvement) strategies, were conducted to make quick, simple changes in the workplace. These activities engaged Team Members, began changing the workplace, proved value of investing in improving ergonomic conditions in the workplace, and started the momentum for the ergonomics process.
- **Phase 3: Establish internal expertise and a management system for continuous improvement.** Through training, the skills and abilities of key Team Members were developed so they could conduct ergonomic risk assessments and design/implement solutions in the workplace. This phase established a sustainable improvement process owned and driven by the plant.
- **Phase 4: Establish accountability and audit to sustain the process.** Finally, each ergonomics process was audited against the criteria to ensure the plant met company expectations.

Results Achieved

Within the first full year of launching the Genie ergonomic improvement process at the Washington locations, the facilities realized a 15% reduction in WMSDs. Activities during that year included conducting 20 RAPID Team Events, which engaged over 216 Team Members. During these events, 1,454 workplace conditions were improved, which reduced ergonomic risk factors, non-value-added motions, or both.

To establish internal expertise and resources,

- 59 Team Members serving on ESI teams were trained in screening, assessment, and evaluation tools, and solution design and selection techniques.
- 108 engineers were provided with common design tools and experience to ensure new equipment, tools, and processes are designed to fit the capabilities of people.
- 23 managers and trainers were prepared to conduct awareness training for all Team Members.

ESI teams have assessed and evaluated 611 job tasks for ergonomic risk and implemented 568 workplace changes to reduce exposure. They continue the ongoing process of problem assessment, root cause identification, selection and implementation of effective solutions, and verification of risk reduction.

Data collected from RAPID Team Events and ergonomic risk assessments led to engineering design improvements. Using Humantech's RPM™ (Risk Priority Management) software, a Web-based ergonomic evaluation program, ESI teams, managers, and engineers have been able to share improvement results and solutions to common exposures, which has reduced duplication of

effort. As a result, all individuals involved are able to work smarter and move toward a common improvement goal.

Lessons Learned

- Strong management commitment and support is critical for launch and sustainability.
- Establishing the process is difficult without structure. It needs to stand alone long enough to get the appropriate focus and support.
- Establish clearly defined roles and responsibilities for all Team Members involved.
- Solicit both capital and expense budgets prior to implementation.
- Measure and track the measures. Select both results and process measures. Review the measures with all levels of the organization.
- Begin tracking metrics early, meeting regularly to share results with senior management.
- Align with the right internal groups.
- Hold people accountable for results.
- The investment in an outside auditor/reviewer is critical for objective, comprehensive evaluation.
- Obtaining new equipment and ensuring use of design guidelines continue to provide challenges.
- Getting engineers to accept and practice low-risk design can be a challenge. They must understand their role and expectations. Training must have a personal touch that enables them to leverage their current knowledge.
- Determining root causes and implementing the more difficult fixes are challenging but important elements.
- Focus on risk reduction, not just "feel-good" results.
- Communicate results regularly, frequently, and with all levels of the organization.
- Senior management support is critical; quarterly reviews were very important.
- This is a process; you will never be finished. This is why it is called *continuous improvement*.