

SUPPLIER IMPROVEMENT CASE STUDY

PUMP & VALVE MANUFACTURER

This supplier produces a wide variety of valves and controls for industrial and military/aerospace applications. Products range from discrete components to integrated assemblies. At the time of this case study, the California-based supplier employed approximately 250 employees and occupied a single 95,000 square foot facility.

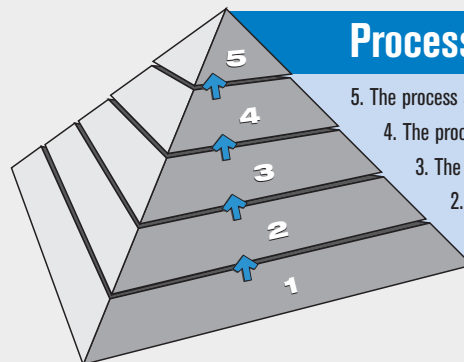
The SEA Lean Enterprise System

The SEA Lean Enterprise System captures the best practices for manufacturing enterprise improvement with a model with three key focus areas; leadership and culture, workforce development and operational excellence. The reason for these three areas is to emphasize the importance of a total organizational approach to managing the transformation. It also acknowledges that long-term sustainability of improvements relies on enterprise-wide solutions and well-managed change. Large-scale changes that do not address all three areas often fail. Implementations of lean that address all three take less effort and are more often successful.

The Process Maturity Model™ is the central element of the SEA Lean Enterprise System.

Process Maturity Model (PMM)

The PMM was developed as an aid for companies who wanted to self-assess and consistently manage overall process improvement. Because the PMM serves as the backbone for all process improvement efforts whether lean, Six Sigma, or whatever comes next, it provides for long-term integration of all improvement approaches.



Process Maturity Levels

1. The process has been identified, defined, and has an owner
2. The process has been documented to the work instruction level
3. The process has certified trainers and is standardized
4. The process is under process control, is analyzed, and improved using data
5. The process shows continuous positive trends and benchmarks world class

Leadership and Culture

In August 2004 the Strategic Planning Workshop was conducted with the executive and middle management team. This workshop provided the necessary foundation for leadership to effectively implement a lean enterprise culture and, subsequently, the ability to sustain results generated through the workforce development and operational excellence activities. Key outcomes include an updated company mission statement, supporting values and assessment, strategic goals, SWOT analysis, action plans, process owners, balanced scorecard metrics, communication system, and understanding of the process maturity model.

Key processes were identified, PMM baseline levels were established, and champions and process owners were assigned.

PROCESS	PMM LEVEL
Continuous Improvement	1
New Product Development	1
Purchasing	1
Quoting - RFQ	3
Planning	1
Assembly and Test	1
Machine Shop	2
Import	1
Material Handling	1
Shipping	1
Inventory Management	1
Holds	1
Acquisitions	1
Training	1
Order Entry	1

In September, this supplier launched their lean planning activity by completing a four-day Management Planning Workshop. Fourteen attendees, ranging from executive to middle management, participated in this activity. Key outcomes included learning the SEA Lean Enterprise System

(LES) and development of a master plan for Phase One implementation. The master plan enables leadership to own and lead the significant changes that will be made in the next six months. In addition, an initial stabilization audit was conducted, which will be a benchmark for subsequent audits, and value stream-maps were created on some key processes.

On day four, the facilitators for the Managing Process Improvement and Workforce Development workshops delivered a brief overview and facilitated a discussion that helped the team link their improvement plans to the three tracks: Leadership and Culture, Workforce Development and Operational Excellence. In addition, the leadership team identified four Kaizen events, and schedules were established for the Managing Process Improvement and Workforce Development Workshops.

The Kaizen events selected were:

- Office (Order Entry to Stock Room)
- Document Control (Engineering)
- Machine Shop
- Assembly (Check and Relief Valves)

In late September, the two-day Managing Process Improvement Workshop was conducted with 12 participants. The purpose of this workshop is to prepare process champions and process owners to fulfill their roles in the company's Lean Enterprise system. Also, the leadership team held "all hands" meetings with the workforce to communicate and promote the adoption of the SEA Lean Enterprise System.

In November, a one-day Strategic Planning follow-up session occurred with the executive and middle management team. Some key outcomes of this session were to further define short/long term actions and metrics that are tied to the strategic goals identified a few months earlier. In addition, the team crafted 1-month, 3-month, and 6-month action plans to manage the implementation of the SEA Lean Enterprise System, and other operational activities.

During the workshop, the executive and middle management team went out on the floor to personally recognize individuals and department teams for their successful implementation of some recent Kaizen events. This was a powerful step in recognizing the workforce for exemplary work. In addition, the leadership team has given recognition gift certificates to team members at the Kaizen report outs.

Workforce Development

In September, the leadership team attended a half-day Job Skills Objectives Setting Workshop. The team identified and prioritized training objectives linked to key company goals. A matrix was created and used to determine the participants, (Subject Matter Experts and Trainers) for the Advanced Planning, Master Trainer and Training Materials Workshops.

Over the following months of this engagement, the three workforce development workshops were facilitated with great results. In particular, the Training Materials Workshop participants were able to link recent Kaizen outcomes, which created significant synergy between the Kaizen and the training aids/materials development. The team even trained some operators, which factored in the Kaizen success as processes achieved level 3 on the Process Maturity Model.

Listed are some Training Aids/Materials that were developed in the Training Materials Workshop:

- 22 types of check valves (90%+ of check valve production)
- 12 types of relief valves (90%+ of relief valve production)
- Three standard solenoid types (90% of solenoid production)
- Set Up instructions for 40% of Metal Working Cells.
- Two types of marking systems (Roller & Laser) 40% of production plus some other materials supporting FOD (Foreign Object Defect) reduction.

Operational Excellence

This supplier identified four Kaizen events for this first engagement, which were scheduled in October, December, January, and February.

Kaizen 1: Office (Order Entry to Stock)

This Kaizen team, consisting of 12 participants, was tasked to address processes starting in Customer Service/Order Entry, Master Scheduling, Planning, Purchasing, Receiving/RI, and the Stock Room.

The 7-day Kaizen event had several key accomplishments that will ultimately improve productivity, reduce cycle times, and increase On-Time Delivery. Highlights of these accomplishments include:

- Creation of work instructions and improved procedures/processes
- Creation of a resource planning tool for an office design and resource requirements
- New layout of office to improve communication and efficiency, internally and externally

- New job descriptions and responsibilities to improve efficiencies.
- Reduce purchasing line item actions with report modifications.
- Institute and maintain one day flow in Receiving Inspection and Stock Room

SOME KEY METRICS			
Metric	Baseline	Post-Kaizen	% Change/ Dollars Saved
Cycle Time Order Entry Thru Purchasing	19	10	47%
Cycle Time (Dock to Stock)	6	2	66%
Purchasing Report Line Items	4895	3000	38%
Overall OTD	82%	85%	3%
Floor Space	12,933 sq. ft.	6048 sq. ft.	53%

Kaizen 2: (ECO)

This five day Kaizen was conducted in early December with 12 participants. The goals centered on the Engineering Change Order System that ultimately impacts the new product development process and other key processes, including product in WIP.

Team accomplishments included:

- Creation of work instructions (still in progress) for the New Product development and ECO process
- Creation of a two forms to accommodate the origination of the EA/ESR/ECR/ECO process. At one point, there were 16 forms
- Implemented twice a week ECO meetings
- Reduce leadtime with ECO's from 21 to 12 days, and continuing to reduce.
- Eliminated product on ECO "hold" in WIP

Kaizen 3 (Machine Set-up)

In January of 2005, a three-day Kaizen with 10 team members, focused on the machine shop set-up reduction in two primary cells with the intent of increasing internal capacity, since a high percentage of products are machined externally.

Improvement Activities included:

- Creation of 95+ work instructions for two different machine cells.
- Created set-up matrix of 90% of the volume for the two cells, about 200 parts.
- Visual validation of the set-up reduction.



Operational Excellence Con't.

SOME KEY METRICS			
Metric	Baseline	Post-Kaizen	% Change/ Dollars Saved
Cell 4 Average Set-Up	3.9 hrs per PN	2.75 hrs per PN	30%
Cell 5 Average Set-Up	2.9 hrs per PN	2.29 hrs per PN	21%
Capacity Cell 4	2 PN's per day	3 PN per day	150% \$26,842
Capacity Cell 5	2 PN's per day	3.88 PN per day	194% \$37,520

Kaizen 4: Valve Assembly

In February of 2005, this supplier conducted a five-day Kaizen on the Check and Relief Valve Assembly line. The goals of this 16-member team were to create a line design and layout, create work instructions, reduce lead-time, improve productivity, and improve quality.

SOME KEY METRICS			
Metric	Baseline	Post-Kaizen	% Change/ Dollars Saved
Manufacturing Lead-Time (Marketing thru Final Inspection)	4.5 Days \$503,000 Inv.	2 Days \$224,000 Inv.	2.5 Days, 55% \$279,000 Inv. \$26,800 Carrying Costs Savings
Manufacturing Productivity	72.7%	85%	14% \$93,234
Quality First Pass Yield	89%	99% in five weeks	10%
Check Valves	90%		
Relief Valves	88%		
Floor Space in Square Feet	2472	1608	864 \$4140
Overtime	\$134,800	\$72,000	46% \$62,800

Summary:

This supplier is effectively implementing all three tracks of the first phase of the SEA Lean Enterprise System. Moving forward, they will continue to further mature their processes, and improve key metrics of the organization that were identified in the leadership work, completed during the early stages of the engagement.

Kaizen	Benefits
Kaizen 1 - Order Entry to Stock	66% cycle time reduction for Dock to Stock 47% cycle time reduction Order Entry thru Purchasing.
Kaizen 2 - ECO Document Control	43% cycle time reduction, 16 for ms to 2
Kaizen 3 - Machine Set-Up	25% set-up reduction, improved capacity by over 150 to 200%, approx. \$64K in capacity gain
Kaizen 4 - Check and Relief Valves	Approximately \$187K savings in carrying inventory costs, productivity, floor space, and reduction overtime.

Members

- BAE Systems
- Bombardier
- Hamilton Sundstrand
- Rockwell Collins
- Sikorsky
- United Technologies
- Textron
- The Boeing Company
- Cessna
- Parker Aerospace
- Lockheed Martin
- Northrop Grumman
- Pratt & Whitney

SEA is an alliance of leading aerospace, defense and space prime and subcontractors whose purpose is to accelerate the development of supply chain capabilities in order to ensure American competitiveness

Goals

Create a unified vision and a collaborative industry-wide approach to supply chain development that eliminates duplication and aligns existing resources

Lead the deployment of SEA Lean Enterprise System throughout our supply chains

Mission

Accelerate Supply Chain Performance

Board of Directors & Officers

- Michael G. Beason - Chairman
- Richard Hall (PA) - Vice Chairman
- Kenneth Marcia (UTC) - President
- Thomas Plungis (LM) - Vice President
- David J. Blanco - Secretary
- Mickey L. Wiebe - Executive Director
- Roger Weiss (RC) - Director
- Robert Gower (BC) - Director
- John Kraynak (BAE) - Director
- John Saliture (NG) - Director

- BAE is BAE Systems
- BC is Boeing Company
- LM is Lockheed Martin
- NG is Northrop Grumman
- PA is Parker Aerospace
- RC is Rockwell Collins
- T is Textron
- UTC is United Technologies Corporation

This program was made possible by funding from the Employment Training Panel (ETP). ETP is a statewide economic development program that provides training funds to eligible employers to help them compete successfully in the global economy. ETP has developed a solid history of helping California companies become more successful and expand the number of secure, good jobs in California. www.etp.ca.gov