

SUPPLIER IMPROVEMENT CASE STUDY

FILTER SYSTEM DESIGN AND MANUFACTURER

This supplier is a designer and manufacturer of filtration systems to the commercial, transport, helicopter, military, and corporate aviation products for the aerospace and commercial industries. Their expertise extends to virtually any hydraulic, fuel, lubrication, or pneumatic system found on an aircraft, from main hydraulic and flight controls to APUs and main engines. At the time of this case study, the California-based supplier employed approximately 225 employees and occupied a single 127,400 square foot facility, with 88,000 square feet dedicated to manufacturing space.

The SEA Lean Enterprise System

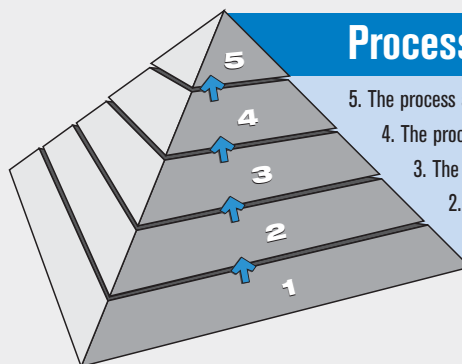
The SEA Lean Enterprise System captures the best practices for manufacturing enterprise improvement with a model with three key focus areas: leadership and culture, workforce development and operational excellence. The reason for these three areas is to emphasize the importance of a total organizational 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 do address all three take less effort and are more often successful. Company President “Everybody is going to take the lean journey.

Either you are going to take it now and make a lot of money or you are going to take it later to survive. SEA maps this journey step by step.”

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 their 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

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

Leadership and Culture

In May 2005 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.

Business processes (40) were identified, PMM baseline levels were established ranging from 0 to 3, and champions and process owners were assigned. Listed below are “Priority A” processes and their initial PMM level:

PROCESS	PMM LEVEL
Continuous Improvement	0
Marketing Intelligence	1
Finance Compliance	2
Training	1
Master Scheduling	1
Shop Floor Control	1
Shipping	1
Assembly Process	2
Mfg. Element Process	2

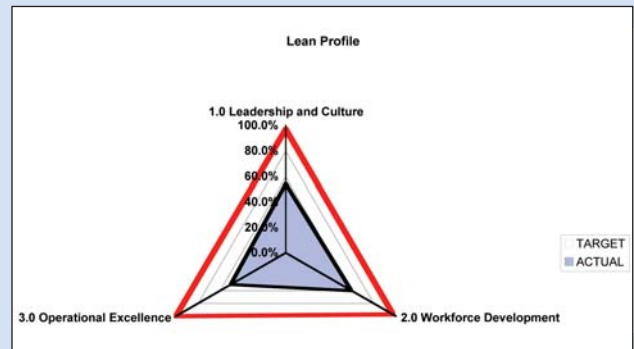
Company president, “By focusing on the 40 key processes identified during the workshops we have experienced decreases in rework, scrap and a marked improvement in overall efficiency...and increased profits.”

In June 2005, this supplier launched their lean planning activity by completing the three- day Management Planning Workshop. Key outcomes included adopting the SEA Lean Enterprise System (LES) and the development of a master plan for Phase One implementation. The master plan enables leadership to have ownership and lead the significant changes that will be made. In addition, value stream-maps were created on some key processes and an initial stabilization audit was conducted, which will be a benchmark for subsequent audits assessing progress.

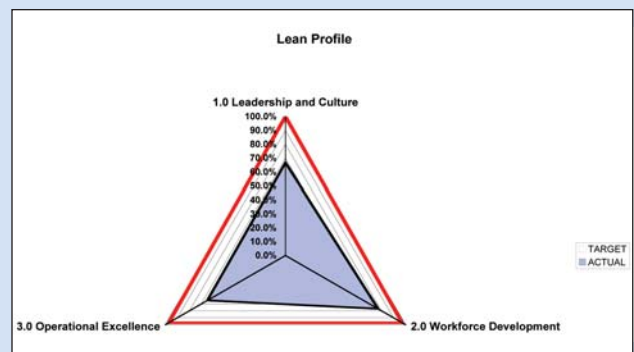
The Kaizen events selected were:

- Coining Operation
- Canister Filter Sub Assembly
- Packaging Cell Design
- Line Balancing, Cell #5
- PMA (Parts Manufacturing Authorization)

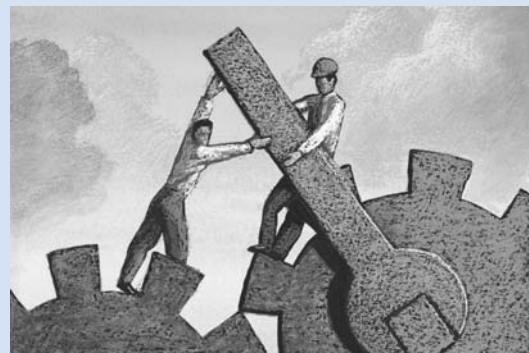
Initial Stabilization Audit:



Post Stabilization Audit:



In July, the two-day Managing Process Improvement workshop was conducted with 15 Process Champions and Owners. The purpose of this workshop is to prepare process champions and process owners to fulfill their roles in the company’s Lean Enterprise system.



Workforce Development

Operations Manager "The workforce development program will provide a solid foundation, allowing the company to grow."

In October, the leadership team also 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 Master Trainer, Advanced Planning and Training Materials workshops. Some of the key topics identified to get the Process Maturity Model (PMM) to level 3 are as follows:

- Element Assembly
- Brazing
- MRR Process
- Pratt Whitney Inspection
- Hydraulic Test Process (Includes set-up)
- Order Entry (Quality Code Issues)
- Lapping Process
- G.M Lathe

The three Workforce Development workshops concluded in March and the training will be rolled-out to the applicable workforce.

Operational Excellence

Operations Manager "For our company, the Kaizen events proved to be the best savings. The program forced us to sit down and solve problems we had complained about for years."

Kaizen 1: Coining Operation

This team, consisting of 9 participants, conducted a 4-day Kaizen event in August that focused on first pass yield improvement. After some experiments, the team decided to change from coin stamping to coin rolling. The end result, there is an improved yield that saves \$4500 of rework and \$2000 in scrap per year/per 5 part numbers in a family. Annual savings based on 50 parts is approximate \$60K.

Kaizen 2: Canister Filter Sub Assembly

This five day Kaizen was conducted in October with 6 participants. The goal of this team was to improve response time and first yield. The team created a flow line and made process changes such as adding epoxy groove, which eliminates hot plates.

Operational Excellence Cont.

KEY METRICS FOR THIS PRODUCT LINE			
Metric	Baseline	Post-Kaizen	% Change/ Dollars Saved
Response Time (50 pieces)	670 minutes	445 minutes	33%
Production Volume Gain	500 - 700 units weekly	1350 units weekly	48% - 63% gain

Kaizen 3: Packaging Cell Design

This event, which concluded in early December, created a packaging cell for productivity improvement. This 10-member Kaizen team created the following improvement activities:

- Determined product mix that would be presented to the cell for packaging
- Determined the "demand" for the cell on a daily basis.
- Reviewed the routers to extract the standard time for each product in the mix for the packaging operations.
- Definition of work at the operation/station.

Productivity gains of \$40K are estimated and opened up capacity for an increase in sales volume.

KEY METRICS FOR THIS PRODUCT LINE			
Metric	Baseline	Post-Kaizen	% Change/ Dollars Saved
Volume Capacity in Units Per Day Average	800	1123	29% \$280,750

Kaizen 4: Line Balancing, Cell#5

The goal of this Kaizen team was to install single piece flow in a production cell. This 4-day activity consisted of 10 team members. Key focus:

- Balance work content at each workstation (all 6 workstations have the same amount of work in minutes/per piece).
- Define work at each station (how much?)

Kaizen 5: PMA (Parts Manufacturing Authorization)

The objective of this Kaizen was to reduce the PMA lead-time from ESA (Engineering Supplier Approval) to FAA submittal. This team, consisting of 10 team-members, worked together for 3 days in March to achieve a significant lead-time reduction. Engineering personnel will be trained on cost estimating and then will exclusively manage and control to first cost estimate, which will minimize the delays and bottlenecks when multiple departments are involved. The end result, more PMAs can be processed and submitted annually.



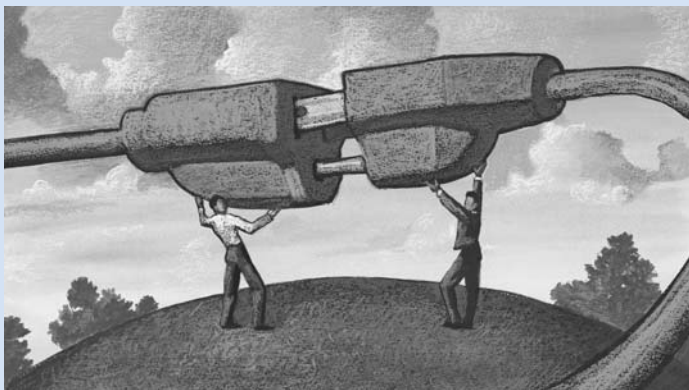
Operational Excellence Cont.

KEY METRICS FOR THIS PRODUCT LINE			
Metric	Baseline	Post-Kaizen	% Change/ Dollars Saved
PMA Lead-Time	20 weeks	16 weeks	20%, \$70K additional revenue potential

SUMMARY OF RESULTS	
Kaizen	Benefits
Kaizen 1 - Coining Process	Reduced rework and scrap, \$60K potential savings.
Kaizen 2 - Canister	33% in improved response time, 48% to 63% productivity gain.
Kaizen 3 - Packaging Cell Design	\$40K in productivity gains.
Kaizen 4 - Line Balancing for Cell #5	\$280,750 in volume capacity change could achieve \$500K if customer demand is received.
Kaizen 5 - PMA	20% reduction in lead-time, \$70K annual revenue potential.

Conclusion:

This supplier has demonstrated significant tangible results and sustained progress toward their goal of becoming a lean enterprise. The SEA LES has been and continues to be a key implementation strategy for their continuing success.



Members

- BAE Systems
- Bombardier
- Dresser-Rand
- Hamilton Sundstrand
- Lockheed Martin
- Parker Aerospace
- Rockwell Collins
- Smiths Aerospace
- Textron
- Tyco Electronics
- The Boeing Company
- Cessna
- Firth Rixson
- Honeywell Aerospace
- Northrop Grumman
- Pratt & Whitney
- Sikorsky
- Space Systems Loral
- TW Metals
- United Technologies

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

- BAE Systems - Dennis Bent
- The Boeing Company - Robert Gower
- Dresser-Rand - Kenneth Marcia (President)
- Firth Rixson - Michael Carr
- Hitco Carbon Composites - B J Schramm (Vice President)
- Honeywell Aerospace - Bill Hayden
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- UTC - Richard F. O'Donnell, Jr.
- SEA - David J. Blanco (Secretary)
- SEA - Michael G. Beason (Chairman)
- SEA - Mickey L. Wiebe (Executive Director)

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