

# SUPPLIER IMPROVEMENT CASE STUDY

## Electronic Component and Assembly Manufacturer

*This supplier designs and manufactures high reliability electronic connectors and harness assemblies for the military, aerospace, and biomedical markets. This supplier has focused on niche Interconnect products used in radar systems, spacecraft, missiles, soldier-based equipment and medical devices-any demanding application requiring small packaging and high reliability. During the course of this case study, the California-based supplier increased its revenue by approximately 10% while at the same time reducing its overtime by a factor of ten. This manufacturer occupies a single 35,000 square foot facility and employs 140 people.*

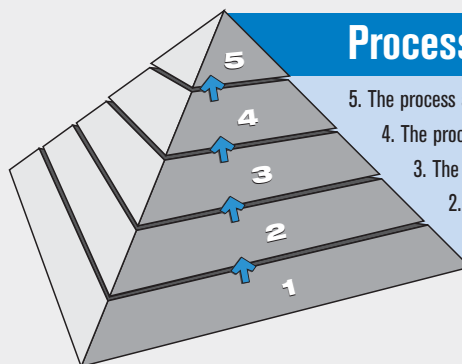
### The SEA Lean Enterprise System

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. Lean implementations that address all three focus areas typically achieve substantially better results with less effort.

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 it provides the basis for a sustained and measurable improvement program, irrespective of the improvement approaches and tools (e.g.: lean, Six Sigma, etc) selected.



### 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 July 2004 the Strategic Planning Workshop was conducted with the executive and middle management team. This workshop implemented the foundational elements for the transition to a lean enterprise culture. Such transformation is necessary to ensure sustainable results through the initial workforce development and operational excellence activities and beyond. Key outcomes included a “lean vision” statement, updated company mission statement, supporting values and assessment, strategic goals, SWOT analysis, action plans, process owners, balanced scorecard metrics, communication system, and an 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	0
Assembly	1
Design/Engineering	1
Final Inspection	1
Issue Review Process	0
New Project Launch	1
Planning	0
Production Control	0
Purchasing	1
Inventory Control & Maintenance	0
Testing (in process)	0
Training	0
Router Control	1
Benefits Administration	0

In August, this supplier launched their lean planning activity by completing a four-day Management Planning Workshop. Ten leaders, including executive and middle management, as well as some first line supervision participated in this activity. Key outcomes included learning the SEA Lean Enterprise System (LES) and the 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 throughout the subsequent eight months. An initial stabilization audit was also conducted and value stream maps were created, both of which will be used as a benchmarks for subsequent audits.

On day four, the facilitators for the Managing Process Improvement and Workforce Development workshops led a discussion and provided the necessary global view to help the team link its improvement plans to the three tracks: **Leadership and Culture, Workforce Development and Operational Excellence.** At the conclusion of this event the

enterprise’s leadership team identified four Kaizen events and schedules were established for the Managing Process Improvement and Workforce Development Workshops.

*The Kaizen events selected were:*

- Receiving /Receiving Inspection/Stock Room
  - Preparing these areas to support the lean and agile environment planned in the new facility
- Kitting to Crimping
  - Leaning these processes common to most product lines within the enterprise
- Issue Review
  - Including non conforming materials, material review board, internal audits, customer satisfaction, root cause and corrective action, management review
- Top Level Business Process
  - In-depth value stream mapping and identification of next steps of the lean transformation.

In late August, the two-day Managing Process Improvement Workshop was conducted with 11 participants.. Also, the leadership team held “all hands” meetings with the workforce to communicate and promote the adoption of the SEA Lean Enterprise System.

In December, a one-day follow-up session occurred at the request of the enterprise’ leadership team. The early success of the implementation of the Process Maturity Model encouraged them to fully embrace the Model by listing “all” processes (over 100), while assigning Process Champions and Owners to each of these processes. This effort laid the groundwork to accelerate transformational activities across the enterprise and demonstrated sustainable utilization of the PMM into the business culture.

## 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, three successful workforce development workshops were facilitated. Processes that now have certified trainers and training materials ready to transfer knowledge to applicable employees in the workforce include the following:

- Cleaning
- Crimping
- Potting
- Marking
- Solder
- Etch
- Welding
- Wire Cutting
- Lead Forming
- Pack Ship

# Operational Excellence

This supplier identified four Kaizens for this first engagement, which were scheduled in. September, November, January, February, and March.

### *Kaizen 1: Receiving / Receiving Inspection / Stock Room*

This Kaizen team, consisting of 10 participants, was tasked to develop a new and improved layout for the Receiving, Receiving and Stock Room areas. The timing of this Kaizen was appropriate as this company was preparing for its move into another facility in the October/November time frame. The new layout design will reduce lead-times for product flow, while minimizing floor space. Additionally the stockroom was reorganized and agilized through the use of metro carts and by product line.

SOME KEY METRICS			
Metric	Baseline	Post-Kaizen	% Change/ Dollars Saved
Lead-Time from Kitting to Crimping	6 days	3 days	50%
Work in Process	80 kits in WIP (73 to be kitted)	44 kits in WIP (18 to be kitted)	45% 75%
On-Time Delivery	70%	78%	8%

### *Kaizen 2: (Kitting thru Crimping)*

This five day Kaizen event was conducted in mid November, shortly after the move into the new facility. This Kaizen team, consisting of 14 members, was chartered to reduce lead-time, WIP Inventory, and handling from Kitting thru the Crimping processes.

SOME KEY METRICS			
Metric	Baseline	Post-Kaizen	% Change/ Dollars Saved
Lead-Time of Raw Materials to Stockroom (Dock to Stock)	19 hours	10	47%
Walking Distance for Product Flow	1512 sq. ft.	435 sq. ft.	71%

### *Kaizen 3: Issue Review (Part 1)*

In January of 2005, a five-day Kaizen with 12 team members, focused on redesigning, developing, and implementing key non conforming materials systems that will flow into a company wide corrective action and management review procedures:

- RMA (Return Material Authorization)
  - returns from customers
- DMR (Discrepant Material Reporting)
  - discrepant materials from suppliers
- NCMR (Non-conforming Material Reporting)
  - discrepancies discovered during the enterprise's value add
- MRB (Material Review Board)
  - the system utilized to review and disposition all three types of non conforming materials

SOME KEY METRICS			
Metric	Baseline	Post-Kaizen	% Change/ Dollars Saved
Number of Open DMR, RMA, and NCMR	DMR = 10 RMA = 15 NCMR = 1	DMR = 8 RMA = 15 NCMR = 2	DMR = 20% RMA = 0% NCMR = 50%
Average Days Open	DMR = 7 RMA = 30 NCMR = 5 \$143,485 in inv.	DMR = 3 RMA = 15 NCMR = 3 \$71,743 in inv.	DMR = 58% RMA = 50% NCMR = 40% \$7,891 in carrying cost reduction

### *Kaizen 3: Issue Review (Part 2)*

In February of 2005, this Kaizen event, consisting of 10 team members, continued the focus of redesigning, developing, and implementing key procedures to facilitate the timely and accurate disposition and prevention of non-conformities. The elements addressed in this follow up event included.

- Internal Audits
- Corrective Action
- Customer Satisfaction
- Management Review

SOME KEY METRICS			
Metric	Baseline	Post-Kaizen	% Change/ Dollars Saved
Average Number of Days Open	Audit = 20 CA = 20 CS = 67	Audit = 20 CA = 10 CS = 5	0% 50% 92% \$51,000/yr. cost of quality
Lead Time, Response Time	67 days	20 days	70% \$35,500/yr. in carrying cost

### *Kaizen 4: Top Level Business Process*

In March of 2005, this Kaizen event, consisting of 11 team members, met for three days to value stream current and future state for the top-level business process. The purpose of this event was to lay the foundation for identifying and prioritizing the next steps of the lean transformation.

#### *Accomplishments included:*

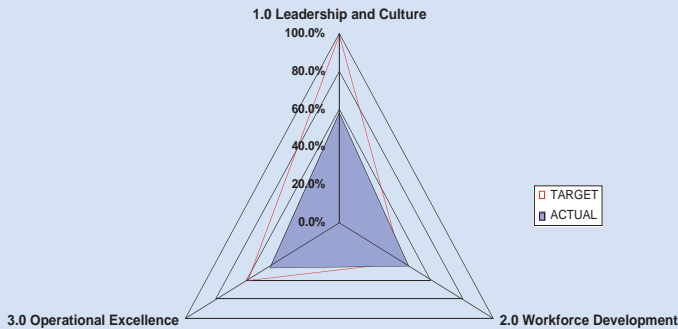
- Created top-level process flows
- Created level 2 process flows
- Created level 3 tasks and actions
- Created current and future state for top-level processes
- Corrections of key process champions and owners.



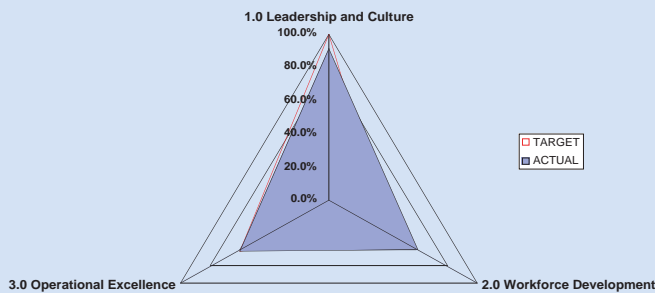
**Summary:**

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. In addition, there was marked improvement from the pre and post stabilization/lean profile audits.

**Lean Profile 8/17/2004**



**Lean Profile 3/11/2005**



SUMMARY OF RESULTS	
Kaizen	Benefits
Kaizen 1 - Receiving/Inspection/Stock Room	Lead time reduced by 47%, 71% floor utilization improvement
Kaizen 2 - Kitting to Crimping	50% lead-time reduction, 8% OTD improvement
Kaizen 3 - Issue Review	Corrective action procedures corrected, improved, development, and implemented, \$43,391 in yearly carrying costs reduction, \$51,000 yearly cost in quality
Kaizen 4 - Top Level Business Process	Created current and future state for top-level processes, overall on all Kaizens, reduced 7% in overall lead-time of top-level processes

**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](http://www.etp.ca.gov)