



# 2005

## MISSOURI TEAM QUALITY AWARD RECIPIENT

### FMTV ARMOR PAINT OPTIMIZATION TEAM at Systems & Electronics, Inc., West Plains



#### PROFILE

Systems & Electronics Inc. (SEI) is headquartered in St. Louis, MO, with a manufacturing facility located in West Plains. SEI is a full service supplier of diversified defense products and advanced sustainment solutions for the U.S. military and other government customers. SEI, (a subsidiary of Engineered Support Systems Inc. (ESSI) operates a factory in West Plains that employs approximately 450 people and specializes in heavy metal fabrication (including Army tank trailers, Air Force aircraft loaders, and ballistic armor kits).

#### OPPORTUNITY FOR IMPROVEMENT

Due to insurgent and terrorist attacks on U.S. military convoys in Iraq, Radian, Inc. (also an ESSI subsidiary), was awarded a contract to provide ballistic armor kits for the U.S. Army's Family of Medium Tactical Vehicle (FMTV) trucks. Expedient delivery was instrumental to mission success for U.S. troops. Radian secured a subcontractor to fabricate the components, but the subcontractor withdrew from the contract as the first kits were processed, leaving Radian without a supplier. SEI had the manufacturing capability, but it was not in the production plan and would overlap ongoing production. It appeared the transition to SEI so late in the process would overload paint capacity, limiting ability to deliver the required schedule of 25 armor kits weekly. Each kit is 2,275 separate parts, and many require painting with a special U.S. Army Chemical Agent Resistant Coating system. Initial project planning confirmed the painting would ultimately pace production and delivery. Using part "nesting" estimates (how parts are hung on the paint conveyor line) and historical data, SEI estimated capacity must be increased by 20%, utilizing all available shifts to meet customer needs.

With a primary objective of improving paint conveyor line output, the SEI Continuous Improvement Council (CIC) chartered the FMTV Paint Optimization Team to address the issue of the unexpected, yet critical FMTV armor kit program.

#### TEAM ACTIONS

SEI initiated the Define, Measure, Analyze, Improve, and Control (DMAIC) methodology, selecting team members based on skills and resources needed to define and implement improvement, with particular consideration given to stakeholders. Teams must report progress for each project phase during DMAIC gate reviews. Reviews are constructed around a checklist outlining specific deliverables. The team developed a data collection plan and baseline performance data using Voice-of-the-Customer models and Critical to Quality diagrams. The measure phase revealed a problem larger than originally estimated. Rather than 20%, a 31% improvement was necessary to meet the customer's schedules. Using Six Sigma tools (process maps, Pareto charts, statistical control charts, etc.) the team analyzed the process to define the critical elements with the greatest impact to paint conveyor line output. They identified and prioritized potential solutions based on anticipated impact, ease of implementation, and cost using trial runs to assess effectiveness. Improvements were evaluated for impact with primary Critical to Quality metrics. SEI teams are empowered to implement improvements and because most key stakeholders were team members, changes were implemented with immediate output improvements.

#### RESULTS

The final gate review showed improvements over 60% in output and 19% in overall cost, enabling SEI to manufacture and ship armor kits per the customer's schedule. The added capacity also facilitated additional contract awards for ballistic armor kits. SEI has delivered over 2,000 armor kits, receiving numerous reports about the armor kits produced by the West Plains facility saving lives of U.S. soldiers.

#### FUTURE PLANS

SEI teams continue to utilize the DMAIC process in manufacturing, human resources, and safety improvement, completing eight projects totaling savings over \$1.5 million. Future plans include proliferation of Six Sigma/DMAIC to SEI headquarters for use by administrative, program management, and engineering. DMAIC's structured, data driven approach was key in meeting SEI's policy of "Total Customer Satisfaction Through Continuous Improvement and Teamwork."

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