Automotive – 90% Lead Time Reduction

Facing potential closure, an automotive manufacturing business is returned to profitability in just eight months

Improvement Initiative

After a small automotive division of a fortune 50 company lost $10M in 2006, the leadership team was given the ultimatum to make the division profitable or close the business. The operations team was then given the task to consolidate two of the three manufacturing plants that made up the division.

Improvement Opportunities:

- Two plants one hundred miles apart
  - Plant 1 produces rolled insulation and ships it to plant 2
  - Plant 2 die cuts the rolled insulation and ships it to the customer
- Three days of raw material inventory at plant 1
- Seven days of WIP inventory at plant 1
- Seven days of WIP inventory at plant 2
- Fourteen days of finished goods inventory at plant 2
- 6,000 ppm defects shipped to the customer
- Total lead time from raw material to finished goods shipped is 31 days

Improvements

- A milk run was implemented for all of the raw material shipments
- SMED kaizens conducted on insulation and die cut lines
- Productivity and quality kaizens were completed on the die cut line
- Pull systems were implemented for raw materials, WIP, and finished goods
- Plant 2 operations moved to plant 1

Breakthrough Results

- Raw material inventory reduced by 67%, WIP reduced by 93%, and finished goods inventory reduced by 86%
- Total lead time reduced from 31 days to three
- Warehouse space reduced by 58 percent – plant 2 equipment relocated to freed up floor space
- Direct labor reduced by 30 percent
- Changeover time reduced by 65 percent
- Shipping costs reduced by $400,000 annually
- Customer reject rate reduced from 6,000 ppm to zero
- Eight months after the consolidation of the plants, the division regained profitability

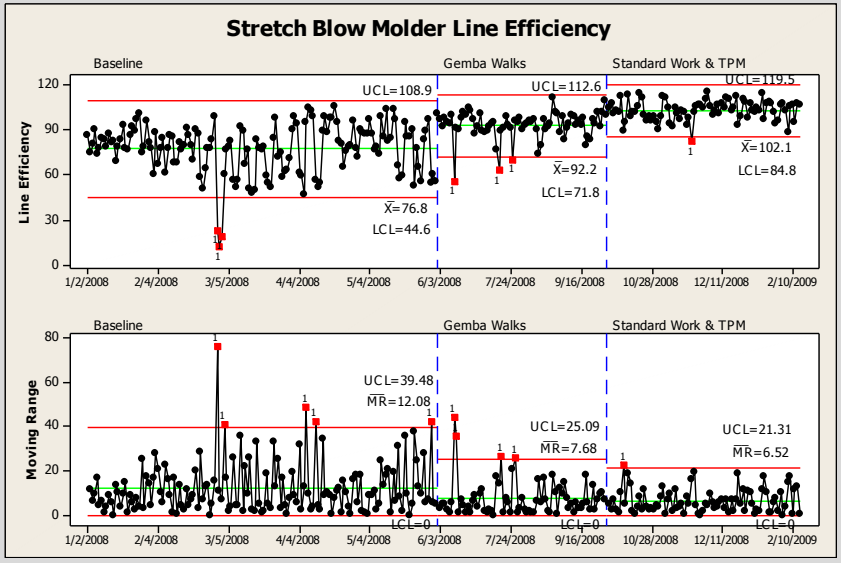
Packaging – Plant Turnaround

A plastic bottle manufacturer for the beverage and food industries was running nearly 25 percent below the expected rate and waste was forcing them to carry excess finished goods inventory

Improvement Initiative

The baseline efficiency data from January 2008 through May 2008 was 76.8 percent. Additionally, the plant had a customer defect rate of 1,300 ppm and was using a combination of internal and external warehousing to store 14 days of finished goods inventory.

Lean six sigma and TPM projects were chartered to raise the efficiency, eliminate the customer defects, eliminate the outside warehouse need, and instill operational discipline.



Improvements

- Gemba walks, equipment restoration, and 5S were used to increase the efficiency from 76.8% to 92.2%
- SMED kaizens were conducted to reduce the changeover time from 4 hours to 1.5 hours
- Standard work, standard work for leaders, and visual controls were used to drive day-to-day consistency
- TPM tools were used to reduce speed losses and minor stops increasing the efficiency to 102.2 percent

Breakthrough Results

- The stretch blow molder line efficiency improved by 33 percent
- The day-to-day efficiency variation was reduced by 46 percent
- Defective units shipped to the customer was reduced from 1,300 ppm to 0 ppm
- Customer complaints were reduced by 80 percent
- Internal scrap was reduced by 18 percent
- Zero lost time injury rate was maintained
- The finished goods inventory was reduced from 14 days to 3 days

Food Manufacturing - Productivity Improvement

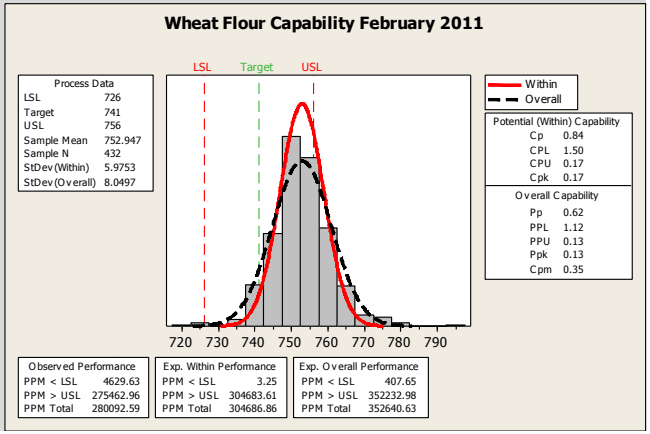
A six month improvement project increases cracker production, reduces scrap, and results in an annual savings of $2.75M

Improvement Initiative

Cracker production at an industrial bakery was performing ten percent below the standard; making it difficult to keep pace with customer demand and resulting in excess overtime cost.

Targeted areas of investigation included:

- Capability of ingredient delivery systems
- Audit of the work methods to ensure consistency with current standard work
- Identify best practices
- Audit of the measurement systems
- Review of the preventative maintenance practices and frequencies
- Pareto analysis of the scrap and downtime

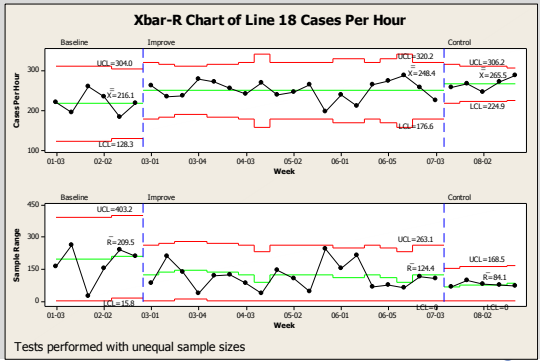


Improvements

- Corrected the flour delivery equipment capability issues detected during MSAs
- Updated the standard work based on the identified best practices
- Modified the post-oven lane conveyors to reduce scrap, downtime and rework
- Added andon lights and poka-yoke system for controlling laytime in the mix room
- Modified equipment PMs to sustain the improvement

Breakthrough Results

- The average number of cases produced each hour is increased from 216.1 to 265.5
- The cases per hour variance is reduced by 81%
- The improvements produce an annual savings of $2.75M



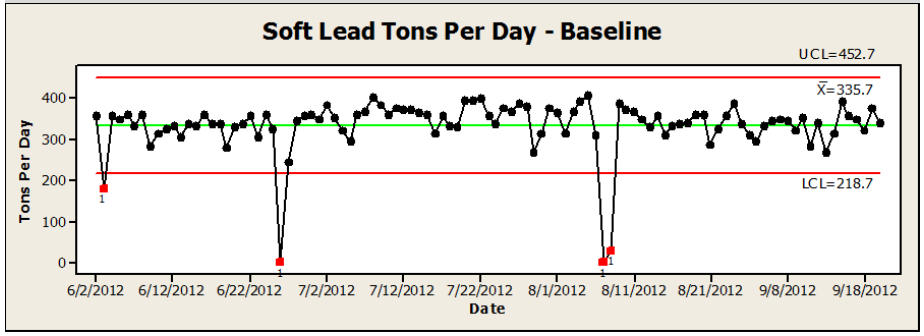
Output Improvement Increases Profits By $8M

The primary plant of a lead acid battery recycling company with annual revenues of $180 million was only producing at 88 percent of the targeted capacity

Improvement Initiative

The baseline data analysis showed that the primary plant was producing an average of 335 tons of soft lead per day. The engagement goal was to increase the soft lead output to the entitlement capacity of 380 tons per day. Increasing the lead production would be accomplished by:

- Applied Science: Understand lead production in context of thermodynamics and phase kinetics
- Material Mixture: Evaluate impact of raw material inputs on production output
- Standard Work: Assess standardization, work instructions, workforce engagement, standard work for leaders
- Process Discipline: Identify critical process inputs and implement run rules to meet process entitlement



Improvements

- Science: Established recipes for the furnace operation across the full range of run rates
- Material Mixture: Defined combinations to efficiently consume all materials in the process and implemented run rules to improve the mix consistency
- Standard Work: Implemented standard work to ensure application of findings
- Material Storage: Implemented storage run rules to insure FIFO and proper material conditioning

Breakthrough Results

- Reduced variation in average daily output from 13.85% to 4.11%
- Shifted average output to 381 TPD for annual increase in revenue of $35.8 million and profit of $8 million