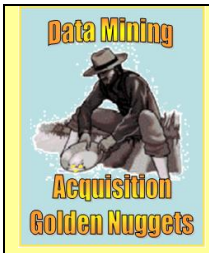

Note: The information provided is for reference purposes only. Although the information provided was accurate and current when first created, it may now be dated. The "Born-on-Date" is when the document was first created. Please contact the originator for updates. Please review the DAU Legal Notice at the bottom of the AKSS homepage for additional guidance. **Keywords** are highlighted in bold.

Problem: How do you get a new product to market faster, with fewer manufacturing start-up problems and improved quality and reliability? GE Medical Systems was facing the challenge of developing a new CT Scanner with enhanced performance features as demanded by the customer. Goal, reduce the scan time from 3 minutes to 26 seconds.

Solution: GE utilized their Six Sigma design and build process to design a high-quality product that could be manufactured with fewer defects and higher reliability. Their Six Sigma process resulted in the LightSpeed CT Scanner, a revolutionary breakthrough that not only reduced the scan time from 3 minutes to 26 seconds, but then further reduced the scan time to 17 seconds. In addition, GE was able to improve the life to the tube from 25,00 hours to 200,000 hours! And then through continuous improvement using Six Sigma techniques, further improved it to over 500,000 hours.

Title: Using Six Sigma to Improve **Quality**, Cost and Productivity.

Value Statement: Six Sigma provides organizations with a tool for focusing on continuous improvement activities to achieve near perfection without dramatically increasing costs.

Born-on-Date: 5 July 2004

Background: In the 1960's Motorola was a giant in the consumer electronics market, but they were ignorant of the quality revolution taking place half way around the world. By 1974 Motorola surrendered the television market to the Japanese, then in the 80's the Hi-Fi Stero market was lost, and by the mid-80's computer memory chips were a memory. Motorola Chairman, Bob Galvin, stunned his staff when he demanded a ten-fold increase in quality in just 2-years (from the 1987 baseline) and then another ten-fold increase by 1989. The Communication Sector responded by applying an approach they called "Six Sigma Mechanical Design Tolerancing." Motorola's approach worked so well that Bob Galvin had it implemented corporate-wide and the name "Six Sigma" became the moniker for Motorola's quality revolution and is a federally registered trademark of Motorola.

Discussion: Six Sigma is a statistical term relating to "quality levels per opportunity." Sigma is a term denoting one standard deviation. When you are looking at a characteristic of a population or sample size that characteristic will

demonstrate a distribution (often a normal distribution). For example if you measured the weight of a sample of 1,000 males between the ages of twenty and thirty the average weight may be 170 lbs. Plus or minus one standard deviation or 68.23% of the sample would be between 150 and 190 lbs., and 95.46% would be between 130 and 210 lbs. Six Sigma, that is plus or minus six standard deviations from the mean, will encompass 99.9997% of the sample. In quality terms this is approaching near perfection. Three sigma or 99.73% perfection, will give you 54,000 incorrect drug prescriptions a year, or five missed landings at Dulles International Airport each day! While six sigma will give you one incorrect drug prescription every 25 years or 1 missed landing in ten years at all the U.S. airports combined.

Six Sigma Process Steps:

DMIAC:

Define: You need to identify your customers and suppliers and determine what is important. Then begin to identify problems and opportunities, select the team players and set goals and objectives.

Measure: Review the current process, identify process inputs and outputs, develop a baseline and collect, organize and analyze the current data and assess the variation.

Analyze: Identify the problems at each step in the process and its impact. Prioritize the problems, determine root causes and identify solutions.

Improve: Develop an action plan, prioritize improvements, test solutions, refine, document and implements final solutions.

Control: Measure progress, identify the benefits of the process improvements, recognize the team's success, monitor and manage the gains, and plan for continuous improvement.

Results:

According to the Juran Institute Six Sigma:

- Saved GE $12B over five years
- Saved Honeywell over $800M
- Allowed Motorola to reduce its manufacturing cost by $1.4B between 1987-94, and saved them over $15B over the last 11 years

Benefits:

The application of Six Sigma to a weapon system program in production can result in significant reductions in cost and cycle times, and major improvements in quality, responsiveness and performance.

Application to other programs:

This practice is applicable on any program in which a new high-technology product is being designed, developed, produced and/or maintained.

Key words: Quality Management

(keywords are used to support improved search capabilities in the information repository):

Additional Resources: http://acc.dau.mil/simplify/ev_en.php click on the Production, Quality and Manufacturing Special Interest Area for additional information
http://www.isixsigma.com/library/content/six-sigma-newbie.asp Juran Institute homepage for Six Sigma

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