CASE STUDY

"IT'S NOT THE PEOPLE – IT'S THE PROCESS!"

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Introduction

Since 1958, Waters Corporation has been in the business of making innovative analytical instruments that assist scientists in reaching their scientific goals, increase productivity, and earn laboratory-based organizations a higher return on their investments in research, development, and quality control. After almost 60 years in business, Waters is now one of largest companies in the analytical instruments industry, supporting scientists working in the world's 100,000 laboratories. With a hard-earned reputation for applications expertise and post-sales support, Waters stands out among its peers and, year after year, is one of the best-performing companies in the industry.

Quality Support Group (QSG) was engaged by Waters to provide training in support of a critical element of its corporate quality policy that calls for "fostering an environment of continuous improvement throughout all levels of the organization." There was a desire to learn and apply structured problem solving and to improve products and processes, and Waters agreed that QSG had the capability to help the company to achieve those objectives.

The Certificate Program

Over a three-month period, QSG presented our comprehensive Process Improvement Certificate Program for three teams of employees. The certificate program, customized in consultation with the Waters management team, included four seminars on various statistical methods and required the completion of process improvement projects that were selected by the managers. Each team had a senior manager appointed as the project sponsor.

Seminars on the process improvement techniques and concepts were presented every 3-4 weeks, and in between the workshops the teams applied the tools to their assigned projects. At the beginning of each subsequent seminar in the schedule, the teams were required to present certain "deliverables." For example, two weeks after the initial QSG Process Improvement Tools & Concepts course, the teams presented their project contract (signed by their project sponsor), initial As-Is process map, defined key measures, and summaries of their initial data collection efforts on run charts, histograms, or other appropriate basic graphs.

The Project

The senior management team decided to sponsor a project to increase yields and reduce scrap associated with a precision machined component. This part is produced through a series of machining, cleaning, polishing, and coating operations. The project would focus on reducing chronic defects that were a frustration to managers and employees alike.

After the first seminar, the team mapped the current process and collected data on the major causes of rejects and yield losses at each process step. Their Pareto diagram indicated that the top causes were handling damage, damage due to cleaning, and machining defects. Handling damage accounted for approximately 70% of the total defects and scrap.

Digging deeper into the causes of handling damage, one might expect to find inattentive operators, operator errors, or poor workmanship. The team refused, however, to fall prey to such an assumption. Instead they closely examined, stage-by-stage, the manufacturing process to identify any inherent origins of handling damage. Among other sources, the team documented the following:

- Manual de-burring operation, using a speed lathe
- Surface damage by steel-tipped air guns when cleaning
- Damage caused by buffing operations
- Contact between critical surface and shipping container
- Ineffective and/or unnecessary cleaning steps required of the operators
- Exposed parts in uncovered trays
- Different types and sizes of trays used to transfer parts
- Tray to tray transfer

The different trays were identified as a major opportunity for improvement. Between various machining operations, the parts had to be placed by hand in different-sized trays because different machines needed the different sizes. The team proceeded to standardize the trays from four different types to just one, thereby no longer requiring numerous transfers of the parts between different trays by the operators.

The team also found it could eliminate a legacy buffing operation that required a lot of handling, but which was found to add little value to the quality of the parts. Improvements were also introduced to the cleaning system with new and better ways to control temperature, clean the surfaces and eliminate sources of contamination that resulted in rejects further down the line.

Project Results

Upon completion of the training and project work over a three-month period, the yield improvement team presented their accomplishments in a meeting of senior managers and other project teams. The data documented the following improvements, among others:

Overall cycle time reduced by 4,800 hours annually
1 million fewer opportunities for handling damage to occur per year
30% reduction in scrap due to handling
Eliminated buffing operation (reduced process lead time by 400 hours)
Eliminated cleaning operation ($30,000 savings)
Eliminated need to blow out 1 million parts per year (safer and more efficient)
Lean enhancements including work flow, reduced WIP, over-processing, transportation
Projected labor savings = $100,000 (due to reduction of overtime, rework, etc.)
The team's sponsor noted that just one small portion of the project team's documented cost savings funded the entire QSG Process Improvement Certificate Program

One of the managers who served on the team wrapped up the presentation by summarizing some of their "lessons learned." He said the most important thing they learned about handling damage is, "It's not the people – it's the process." He referred to the original As-Is process map and its numerous inherent manual operations that invited damage. The operators were doing the best they could do; they could do no better; they were constrained by the process.

The Waters commitment to structured problem-solving and continuous improvement was both demonstrated and supported when the management team engaged Quality Support Group for training and consulting services. We expect the Waters-QSG partnership to continue to yield impressive improvements in the future.