



The following case studies demonstrate how Six Sigma Qualtec (SSQI) streamlined the training of engineering staff on automated tools for designing Waste Treatment Plants at a leading engineering construction company. SSQI identified critical inputs that affect the quality, cost, and timing of automation training, matched training to trainee skill level, and established appropriate controls in the automation training process, thereby speeding up the training process and capturing significant cost savings.

Automation Training Evaluation

One of the leading engineering construction firms in the world wants to ensure that it provides its plant design staff with the proficiency required to ensure state-of-the-art plant design for customers. Plant design personnel undergo rigorous training on a variety of design automation tools and skills. However, the company found that in its automation design training, the number of training hours-per-person was projected to increase almost 50%, from an average of 55 hours per person to 108, with no corresponding gain in quality and with an increase in cost of \$500,000.

Historical data indicated that training costs are often over- or under-estimated by as much as 100%. When budgets were tight, training was often reduced, which sometimes led to additional time and cost to provide on-the-job training that was not scheduled or budgeted. Conversely, when training exceeded the historical average, trainees often received re-training in skills they had already mastered. In addition, if training was unavailable when new personnel were ready to begin work, productivity could suffer and delays in project schedules could result.

By evaluating the various engineering automation programs across the major disciplines – the SSQ team was able to narrow the focus to a particular type of plant design, which used the greatest number of automation tools and training hours. The team then developed a high-level map depicting the overall engineering automation training process. The process map depicting the chronology of training courses revealed that the skill levels of trainees were often not matched to course levels, resulting in the slowing down of entire training classes and it also uncovered several non-value added steps.

As a result of the team's work, the company implemented numerous improvements in the training process:

- Screening of trainees was initiated to match skill level to training needs.
- The delegation of responsibilities among Engineering Automation, Training, and the Engineering Discipline was clearly defined.
- Processes for identifying and approving training courses were put in place.
- Procedures for documenting employee training records were established and missing documents were located.
- A control plan was developed to measure improvements, to track training of new hires, and to record total training hours, cycle time, and proficiency test scores when training is completed.

Business Improvements

Current data indicate that the average number of training hours per person has been reduced from the forecasted 108 hours per person to an average of 37 hours per person, a 66% reduction, resulting in savings of \$600,000. In addition, engineers receive the training at the right time, diminishing costly on-the-job training and enabling the company to more accurately estimate training and project costs.

Although initially focused on the plant design department, the project has been so successful that its improvements will be extended to benefit all of the engineering disciplines that require automation training, as well as other automation training programs.