



CASE STUDY

It's in the Genes At Cummins

by **Susan E. Daniels**, editor at large

"Six Sigma is part of Cummins' DNA," explained Jill Olds when asked why the venerable diesel maker decided to use Six Sigma to help explain its new health insurance benefits and enable a smooth enrollment process, particularly for union members.

Olds, a Six Sigma Black Belt (BB), led the nine-member team that worked on the project for the

HR department of Cummins' Services Center in Columbus, IN, its headquarters. She was leading her first Six Sigma project.

Communications director Janet Williams, a Six Sigma Green Belt (GB), was on the team as well. At Cummins, GBs and BBs get the same training, but GBs stay in their functional area, while BBs work across functional areas.

Other team members were Monica Field and Buzz Bolton from the business services group, Mike Copple and Rudy Baker from the Diesel Workers Union Board, Margo Root and Mike Harris from the labor relations group and Greg Johnson from HR.

In 50 Words Or Less

- Six Sigma is the process improvement method of choice at Cummins.
- Various tools—such as process maps, cause and effect matrixes, funnels, failure mode effect analyses and measurement system analyses—were used for a recent HR project.
- The project results exceeded overall goals.

Training the Team

Olds was surprised to learn that she and Williams were the only team members with Six Sigma training—unusual because Six Sigma is such a big deal throughout Cummins. "Team members were a bit intimidated," she says. So, rather than use existing training templates developed for other Cummins' projects, she created new ones as she personally explained the different tools.

"This made it much less overwhelming, Olds explains. "Team members weren't as worried about the right block or box on a chart and were able to focus on the process itself."

DMAIC

As the team members started moving through Six Sigma's define, measure, analyze, improve and control (DMAIC) process, they created a method to determine what they were trying to accomplish.

Union members would have three enrollment choices—two consumer driven plans and one traditional preferred provider organization (PPO) plan. The goal was to get at least 25% of the union members to enroll in one of two consumer driven plans during an open enrollment event.

"This was a big difference," explains Olds, "because unions are not usually at the forefront of this type of change to consumer driven plans." In addition, the union was just completing an 11-year bargaining contract that had featured traditional healthcare insurance.

The first process map the team laid out was at the 50,000-foot level and included the following steps:

- Educate the union members.
- Provide them the tools and technology to evaluate the two consumer driven plans.
- Provide sufficient support for enrollees to understand their decisions.
- Provide help with the enrollment tool.

The process would include ensuring that the union members understood what "consumer driven" means, their choices and confirmation of their elections.

Cause and Effect Matrix

From there the team moved to a cause and effect matrix to identify critical process steps.

Team members immediately recognized one significant and challenging process input: Cummins has an older workforce in southern Indiana made up of manufacturing employees who lack daily access to PCs.

So one of the first things decided was that a support infrastructure would be needed to set up enrollment kiosks and train people to help those enrolling use modeling tools and enter their elections.

Moving through a Six Sigma tool called a funnel, the inputs were narrowed to find the critical X's. A



SIX SIGMA PROJECT TEAM: Members of the Six Sigma benefit enrollment project team at Cummins were (l-r) Greg Johnson, Mike Copple, Rudy Baker, Shelley Stewart (project sponsor, not a team member), Jill Olds, Mike Harris and Margo Rout. Buzz Bolton, Monica Field and Janet Williams were not present for the photo.

failure mode effects analysis with scoring of X's and Y's led team members to risk factors and likelihoods. After determining the most critical risk factors, the team initiated the following actions:

- **Educating employees and families:** This was accomplished through meetings, print materials, educational materials for HR personnel and line managers to use during weekly staff meetings, and a video featuring union members talking about the consumer driven plans.
- **Training all members of the union board and all shop stewards who had supported the plan through the contract phase:** Having these people enroll in one of the two consumer driven plans was seen as key to the success of the project because it added credibility to the process.

The team then moved to a measurement system analysis gauge repeatability and reproducibility instrument to create a baseline. The baseline was subjective because this was a first-time event with no real past data.

Developing a method to collect data came next.

About Cummins

Cummins was incorporated as the Cummins Engine Co. in 1919. Convinced diesel technology held great promise both commercially and for fuel economy, Clessie Cummins, the namesake founder, secured manufacturing rights from a Dutch diesel licensor named Hvid.

The first Hvid engines made by Cummins were 6-horsepower, four-cylinder models used for stationary power. Cummins found the technology underdeveloped and unsalable. But with the assistance of a former Hvid engineer named H.L. Knudsen, Cummins was soon producing a pioneering single disk fuel system.

Then the economy crashed in 1929, ushering in the Great Depression. But Clessie Cummins averted bankruptcy by gambling on popularizing the notion of the automotive diesel. In 1933, the company released the Model H, a powerful engine for transportation that launched the company's most successful engine family. J. Irwin Miller, a great-nephew of the man who had financed the start-up of Cummins, became general manager and went on to lead the company for the next four decades.

During World War II, most of Cummins' output went to the war effort. Then came the 1950s and the interstate highway construction program. Truckers started demanding power, reliability and durability, and Cummins responded with technological breakthroughs, including the pressure time fuel injection system introduced in 1954. By the late 1950s, Cummins had sales of more than \$100 million and a commanding lead in the market for heavy truck diesels.

Looking for foreign trade opportunities, Cummins established manufacturing facilities overseas. By the end of the 1960s, the company had a sales and service network of 2,500 dealers in 98 countries.

Meanwhile, at home, the trucking industry consolidated, but Cummins remained independent. Convinced the demand for heavy truck diesels soon would level off, leadership looked to capitalize on the growing market for smaller engines.

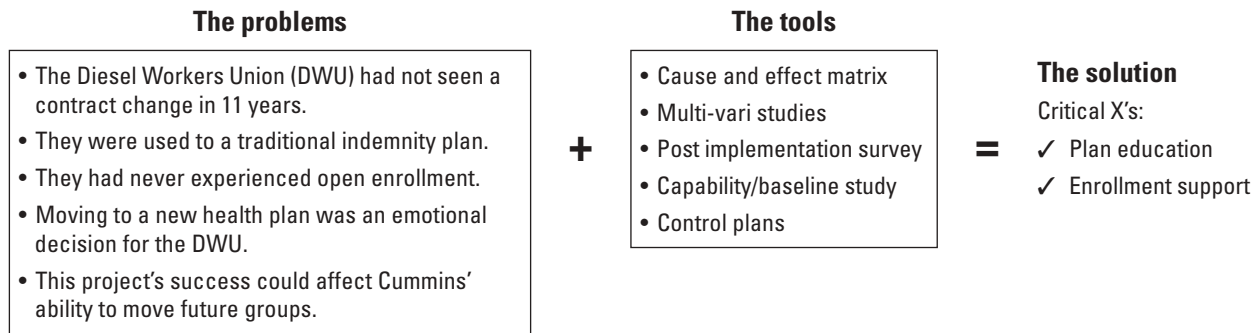
Then came the Clean Air Act of 1970 with tough new diesel engine emission standards. Through its advanced research, Cummins met and exceeded those standards while improving fuel economy and reliability.

In the 1980s, Cummins, facing intense global competition, launched a massive restructuring and began investing \$1.3 billion in new plants, equipment and engine designs.

Cummins reported net income of \$550 million from sales of \$9.9 billion in 2005. For more detailed information on Cummins and its history, go to www.cummins.com. ASQ members can read more about Six Sigma projects at Cummins at www.asq.org/manufacturing/why-quality/case-studies.html.



FIGURE 1 Analysis and Overview of Cummins' Project



The team surveyed union members as they exited the enrollment kiosks to determine:

- The usefulness of pre-enrollment communications.
- Opinions on the enrollment and modeling tool.

Multi-Vari Studies

To determine whether there was any correlation between a the choice of plan and the enrollee's gender, the team did a multi-vari study using chi-squared analysis. No difference was found.

Another multi-vari study was conducted to determine whether an enrollee's age had any effect on the plan chosen. This was important to learn because some of Cummins' older workers had access to retiree healthcare.

There was also a reimbursement component for the healthcare plan allowing those who don't often use healthcare insurance to save more for retirement. Age seemed to have no effect on enrollment.

Next, analysis was done to determine whether work location had any impact on enrollment. This was also important to learn because stewards and kiosk attendants had differing knowledge levels about the plans and the enrollment tool.

Analysis showed that work location related to the kiosk attendant assigned had affected enrollment. So, for the future, the kiosk attendant profile was modified to include benefits experience.

Because no one was enrolled in the new plans prior to the first enrollment date, the team figured

it started with 100% defects. In Six Sigma terminology, the process capability of the enrollment project showed a sigma shift of 1.71.

Lessons Learned

Olds shared lessons learned that might be helpful to anyone planning a similar project:

- Face-to-face interaction between union members and union board members, shop stewards and line HR personnel was critical because all played a role.
- Employee meetings were helpful, but face-to-face assistance at the kiosks was essential in educating enrollees about the plans and the enrollment process.

The members of the team and HR department were extremely happy with the results, with 51% of union employees enrolling in one of the two consumer driven plans. (See Figure 1 for an overview and analysis of the project.) This number held steady during the second year, with 53% enrolling in 2006.

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