Quality Management at Spectrum Control Inc.

Spectrum Control Inc., headquartered in Erie, Pennsylvania, was founded in 1968 by Thomas L. Venable, Glenn L. Warnshuis, and John R. Lane, three engineers who had met at Erie Technological Products Inc. In 16 years, the company grew from a $300,000 start-up housed in an old hardware store to a solid, $22-million public company. Today, Spectrum has four manufacturing plants and some 1,500 customers, including IBM and Hewlett-Packard. For the past 3 years, it has reported after-tax returns of about 10 percent of sales.

In the early days, quality wasn't an issue. Venable and Warnshuis designed and built Spectrum's sophisticated filters, while Lane marketed them. "There wasn't any point in making them wrong," Venable says with a chuckle. But, as the company began to prosper and grow, that kind of hands-on responsibility fell by the wayside.

Like most manufacturers—and like most businesses—Spectrum began to operate on the philosophy of acceptable-quality levels, or AQLs. The company regularly checked a sample of the product, then shipped the whole batch, as long as the number of bad units fell within accepted limits. If there were too many bad ones, the lot was rejected, or subjected to 100 percent inspection, an expensive process.

Then, slowly, Spectrum's marketplace began to change. A Japanese company, Murata Manufacturing Co., purchased Erie Technological Products (now Murata Erie North America Inc.), with which Spectrum competed, and raised the specter of Japanese-style quality. Several of Spectrum's customers began to make noises about quality as well. "About two or three years ago," says Venable, "Hewlett-Packard said that they were going to switch to the idea of 'zero defects'—no defects in any inbound materials." Soon IBM was joining the chorus—and implying, Venable remembers, that a business hoping to remain an IBM supplier better begin thinking seriously about quality.

Venable and other Spectrum managers began to assay likely strategies for attacking the newly discovered issue. They looked at some Japanese quality techniques. . . . They bought 40 copies of *Quality Is Free* by management consultant Philip Crosby, a book that IBM had been pushing, and passed them out. They also bought and studied some videotapes featuring W. Edwards Deming, the dean emeritus of statistical control of quality.

Essentially, Crosby suggests that precise requirements be set for every business task and that those standards be met each and every time. If problems occur, in either performance or product, permanent solutions must be found as soon as possible; temporary fixes won't do.

Crosby's evangelical approach paid off in at least one major way: It destroyed the shibboleth of AQLs. "I think the principal benefit," Venable says, "was that it convinced us that, given a structure, it was possible to work toward zero defects, toward error-free performance."

Venable's plan was to use Crosby's razzmatazz and routines to get things moving, then rely increasingly on Deming's techniques to control the process—modifying both, whenever it seemed necessary, with approaches of Spectrum's own design.

Some of the changes came easily, such as paying closer attention to customers' schedules. In the past, the company had often shipped its components too early, and the customers simply shipped them back. The cost of such errors, says Venable, was significant, particularly in the case of overseas deliveries—"$150 to $200 for transshipping, and $300 for paperwork." At the other end of the pipeline, Spectrum installed new order-entry checking systems, "so we've seen a tremendous improvement in our error rate there."

For the most part, though, the improvements come slowly. "Easy?" snorts one worker in the Electromagnetic Division. "It was like giving up smoking and drinking, plus going on a diet—all at the same time." Changing the habits and attitudes of Spectrum's workers was hard enough. But a thoroughgoing approach to quality involved the company's vendors and customers as well.

There was, for example, the matter of the bushings—small, threaded items used to connect glass-sealed filters to other devices. The bushings were manufactured by three screw-machine suppliers, inspected by Spectrum, sent to a plating vendor, and, once plated, inspected again. At that late date in the process, some 50 percent were rejected.

"After you'd gone through the QES classes," says Electromagnetic Division unit manager David Weunski, "you were supposed to go back to your unit and think of things that had been giving you problems over the years. . . . This one, of course, leaped out at me."

The solution, however, did not. Only after endless hours of brainstorming and conferences with suppliers did Weunski hit on a strategy. During the initial inspection, he realized, Spectrum employed gauges that indicated only when the bushings exceeded the correct dimensions of the finished product; not until later, after another layer of metal had been added in plating, did other problems show up. So Weunski ordered $7,000 worth of new gauges, one set to measure the raw bushing and another to measure the plated one, and donated duplicate sets of gauges to his vendors. "Before," he says, "we would probably have put the burden of buying the gauges on them. Now, the attitude is much more cooperative." And the early results, he adds, are dramatic. "When all of the gauges are in place, we could be talking about a *doubling* of productivity."

Then there was the matter of Department Number Nine at the Electromagnetic Division, which produces, among other things, shielded windows. These windows—artfully crafted panels of dark, curved glass that are fastened to the front of a computer screen—absorb the 6 or 7 watts of radiated energy produced by some computer terminals and thus prevent anyone from "reading" the screen's information at a distance. But they are inordinately difficult to manufacture. Composed of layers of glass, wire screening, and laminating materials, they tend to delaminate when exposed to temperature extremes. "At worst, rejects were running as high as 15 percent," says unit manager Cy Ley.

Although Number Nine already had been wrestling with the issue, Spectrum's quality initiative pushed it to take some radical steps, such as changing vendors. For instance,

Homalite Inc., of Wilmington, Delaware, had once provided the parts for the plastic laminate but had lost the contract to another supplier; then, when quality became a top concern, Homalite got it back. "Basically," says Homalite general manager Rod J. Field, "we lost them on price, but won them back with quality. They sent a four- or five-man team down to review what we were doing here—and then we were back in business."

Department Number Nine supervisors have also become aggressively receptive to suggestions from line personnel. "No one is really an expert except the person who's out there building that window," Ley concedes. "One of their suggestions actually increased our productivity by something like 50 percent."

The net effect: a scant 0.08 percent reject rate on the newest line of windows. "Because of the dramatic improvement," observes Venable, "we were actually able to reduce our pricing on this product line."

Overall, there are few people, processes, or products that haven't in some way been affected by Spectrum's quality crusade. There is now a vendor-selection committee, for example, and the number of active suppliers has been trimmed by 8 percent. The company is also more demanding of customers. When it felt that one client's specifications for a filter used in the B-1 bomber were unattainable, it said so, and lost the work, but promptly got it back when the competitor that got the job discovered (and proved) that the unit couldn't be built as designed. Not even the company's outside directors have escaped the reeducation process: Venable recently asked several of them to attend Crosby's Quality College.

Tom Venable, for his part, is happy with the results, despite the difficulties. "In our first quarter of Quality Response Process operation," says Venable, "we've seen a 75 percent reduction in sales returns and allowances; if you annualize that, you're looking at savings of something like $767,000." Even more telling is Spectrum's profit-sharing balance. Believing that employees should have a fiscal, as well as a psychological, incentive to get involved in the program, Venable earmarked about half of the savings realized for the company's profit-sharing plan. Last year, management had put $150,000 into the program but, high on quality, budgeted $525,000 this year. Now, observed Venable, "We have the feeling that it's going to be quite a bit higher—more like $1 million-plus."*

Assignment

1. What factors led Spectrum to undertake a total quality management program?
2. Identify and describe the major elements of Spectrum's TQM program.
3. Did Spectrum abandon AQLs and other statistical quality control methods? Explain the role of statistical quality control methods in TQC.
4. What role did employee training and education play in Spectrum's TQM program? Assess the importance of employee training and education in TQM.
5. What factors must be present in an organization before a TQM program such as the one at Spectrum can succeed?
6. It has been said that the main philosophy of TQM is "Do it right the first time." Explain how this philosophy is present in Spectrum's TQM program.
7. What are the major benefits that Spectrum has derived from its TQM program?