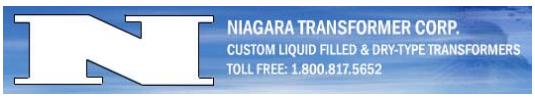
Case Study
UB Center for Industrial Effectiveness



Niagara Transformer Corp.
Lean Efficiencies and Cultural Change

OVERVIEW
Region: Buffalo, NY, USA
Industry: Heavy Industrial

Customer Profile
Since 1938, Niagara Transformer has manufactured large transformers for industry, for power generation and transmission, and for science and research applications. The company has supplied industry giants like GE, Westinghouse, Siemens, and ABB.

Business Situation
The nature of Niagara Transformer's business has been changing, as the company gains a reputation for producing large, custom-designed transformers. In past years, the company produced approximately 3,000 small transformers per year. Today, Niagara Transformer produces upwards of 250 large transformers per year. Significantly larger product requires significantly more production space. But site constraints made expansion impractical. The need to use existing space more efficiently has become increasingly important.

Solution
Niagara Transformer retained The Center for Industrial Effectiveness (TCIE) to launch a comprehensive Lean Enterprise training program. Training and implementation support focused on space efficiencies, often featuring pull systems to reduce in-process inventory and optimize material movement. The program got started with lean overview training and a lean simulation exercise that included every member of the workforce. Steve Klock, Controller for Niagara Transformer, felt that Value Stream Mapping exercises really got people's attention. " I saw people begin to realize just how much work really goes on here, whether in the operation next to them or across the plant. There was great communication across disciplines and renewed respect for one's colleagues that really set the stage for the success of this program."

Niagara Transformer is a supplier of transformers that meet the most demanding applications. It has a tradition of supplying transformers for unique applications with unusual specifications and requirements. As an industry leader, Niagara Transformer has successfully completed several quality audits for university research laboratories and various government agencies and can easily comply with MIL spec. requirements. Its in-house quality control program consistently meets or exceeds customer requirements.

5S organization of the duct paper storage area freed up 50% of available floor space.

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-Steve Klock
Controller
Niagara Transformer

Situation

Niagara Transformer's engineering group custom designs most of the massive transformers that they build. Their 30,000 s.f. facility houses both engineering and production functions – as well as corporate headquarters. Increasingly, the company's core business has become large transformers (liquid-filled or dry). The company also reconditions transformers that are sent to their facility. In short, space is very tight and, because the site cannot accommodate expansion, more efficient use of space is essential. While Niagara Transformer has adapted well to market changes, change has been incremental. The company's skilled workforce was comfortable in well-established roles. But significant space saving and efficiency initiatives required dramatically new approaches. What's more, the company – well under a 100 employees – had limited resources to commit to ambitious improvement programs.

Solution

With help from a New York State Department of Labor grant, Niagara Transformer partnered with UB's Center for Industrial Effectiveness (TCIE) to launch a program of lean enterprise training and implementation. In all, 184 hours of training were delivered across the workforce. Classroom training focused on introduction to lean tools and value stream mapping processes. Implementation, for both office and shop floor, focused on 5S organizational principles and pull systems to reduce clutter and optimize the location of inventory and material supplies. The TCIE team was spearheaded by staff member Al Hammonds and by Lean consultant Bob Lukaszonas. TCIE consultant Thom Marra provided training in Lean principles and Value Stream Mapping.

Shop Floor Wins

Multiple 5S projects were completed that targeted virtually every area of the plant. Some of the biggest wins were achieved in the stacking area. TCIE trainers helped Lean teams design a pull system for steel coils and sub assemblies, while physically reconfiguring storage racks. Reduction in material inventory freed up nearly 50% of available floor space in the area. Streamlined flow and more available space justified purchase of a new forklift dedicated to the area. Previously, a crane had to be

The above communication Whiteboard supports a Kanban system for replenishing steel coils and sub assemblies in the stacking area.

"The TCIE team was able to demonstrate that even minor improvements can really have an impact. Our employees have really caught on. Instead of accepting a bottleneck or shop-floor clutter as a function of the job, we've begun to develop a can-do problem-solving approach. I see it every day."

-Bob Fishlock
Plant Manager
Niagara Transformer

used to lift a forklift from a lower level. Material replenishment time was reduced from one hour to about 5 minutes. General brainstorming for stacking area improvements led to safety gains too. The team implemented use of ratchet straps to better secure material on shelves.

In the duct paper storage area, six storage areas were reduced to two, freeing up 50% of available floor space. Better labelling helped sort paper by size, and a paper staging area was created. A pull system was implemented -- for both material and information flow -- to deliver duct paper to specific operations as needed. Outside storage trailers reduced the need to store paper in high traffic areas.

A comprehensive 5S project in the welding area involved clean-up and removal of a large drill press. 5S improvements drove the replacement of the drill press with a new iron worker, a piece of equipment with more functionality that fit on a smaller footprint.

Operations in the winding area have benefited from labelling and visual communications. A whiteboard dedicated to each winding machine now helps operators communicate between shifts. A master whiteboard streamlines winding machine scheduling and facilitates a pull system for material replenishment.

A pull system for paints and solvents relocated supplies from the warehouse to point-of use. Paints and solvents are now kept in a fireproof cabinet with min-max Kanban triggers for re-supply.

Many non-value added trips to the office were eliminated with the addition of a shop floor email station. The email station provides generally improved communications, while expediting the ordering of supplies and certain raw materials.

Shop Floor Space Saving Initiatives

Area	Tools Applied	Space Savings
Stacking area for steel coils and sub assemblies	Kanban	40-50% of floor space
Duct paper storage area	5S/Kanban	50% of floor space
Welding area	5S	250 s.f. of floor space

According to Plant Manger Bob Fishlock, the real benefits of TCIE's program are a combination of significant short-term efficiency gains and a noticeable change in

A Kanban replenishment system for printer ink cartridges has reduced printer down time and eliminated unscheduled trips to the office supply store.

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-John Darby
President
Niagara Transformer

the company culture. Fishlock notes that "The TCIE team was able to demonstrate that even minor improvements can really have an impact. Our employees have really caught on. Instead of accepting a bottleneck or shop-floor clutter as a function of the job, we've begun to develop a can-do problem-solving approach. I see it every day."

Engineering Department Wins

Lean gains were also achieved in the Engineering Department. Several key successes are summarized here:

- Value stream mapping exercises led to design standardization of a number of transformer components, including mounting brackets and terminal lugs.
- Before delivery, etched stainless steel nameplates are mounted on completed transformers. Previously, CAD artwork was delivered via courier to the producer of the nameplate. Today, a workstation has been set up at the vendor's facility to accommodate electronic receipt of the CAD files, reducing turn-around time by 50% and costs by 20%.
- In the Engineering Department, a computer terminal has been dedicated to visual display of the current status of all open jobs; whiteboards are also used to track job-based activities and assignments.

General Office Wins

The success of lean initiatives at Niagara Transformer has been driven, in large part, by the top-to-bottom adoption of lean and continuous improvement methodologies. President John Darby made certain that lean tools were applied in the office too. According to Darby, "We've demonstrated that all areas of the company can benefit by reinventing processes and mindsets that had gotten resistant to change. Office and shop floor personnel were side by side in some of the lean training. Office staff learned about production challenges, operators learned how demanding the purchasing process can be."

5S initiatives (e.g. labelling, archiving) in the general office and Engineering Department freed up approximately 20% of available space. Brainstorming resulted in improvements to the conference room that included internet hook-up for customers that are on-site for witness testing. A pull system for ink cartridge supplies was installed and has eliminated stock outages and corresponding downtime, particularly vital to the design group. Safety supplies are no longer kept only in the office, but have been pushed out to point-of-use cabinets with visual re-stocking triggers. A simple card file system has eliminated non-value added time that was once used searching for job folders.

For More Information

For more information about TCIE products and services, call our offices at (716) 636-2538. To access information using the World Wide Web, go to: http://www.tcie.buffalo.edu/

For more information about Niagara Transformer Corp. products and services visit the Web site at: http://www.niagaratransformer.com

Summary

Summarizing the success of the program, President Darby credits both the training program and the workforce's openness to change. "TCIE showed us the tools for leaning out our operations and did a great job teaching us how to apply them. Also, our employees have really shown that they understand the importance of sustaining these gains. That this is a work in progress."

Benefits

- Lean implementation workshops freed up floor space in both the plant and office environments
- Lean initiatives have justified new equipment purchases that improve workflow
- Pull systems have been implemented that reduce material stockpiling, improve process and material flow, and locate material when and where it is needed
- Employees at all levels engaged and bought into lean, and a problem-solving culture is emerging.

UB Center for Inudustrial Effectiveness

The Center for Industrial Effectiveness (TCIE) is a program of the School of Engineering and Applied Sciences. We deliver world class solutions to our customers utilizing the best people, the best methods and the right technology. For more information about TCIE, go to:

http://www.tcie.buffalo.edu/

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