

How-To 5S Workshop in Illinois: Housekeeping With an Attitude

Ship-shape work areas and build understanding.

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If you're looking for a leaner, cleaner way of working together plus shared understanding about the need for overall improvement in your company's operations, 5S can be just what you need. 5S encompasses a variety of techniques for sorting, standardizing, and otherwise conquering the "stuff" that oftentimes

clutters work areas, whether in the plant or office (see the box, "About 5S"). It can also be a bit uncomfortable, with project participants peering into corners, giving cherished "just in case" supply stashes the boot, and rearranging the "furniture." Three Illinois host sites braved intense scrutiny and pointed suggestions for improvement during the recent "5S Workshop: A Hands-On Learning by Doing Opportunity" AME event. ACCO (in Wheeling, IL), Bison Gear & Engineering (St. Charles), and Elgin Sweeper (Elgin).

After initial training in 5S basics, workshop participants from "outside" companies and host organizations divided into project teams at each of the three host locations. Selected 5S team activities and results follow.

Bison Gear and Engineering Corporation

Bison Gear aimed to benefit from a 5S team's evaluation of a CNC machining work cell (Mazak AJV Work Cell) and a milling/boring center (750 Area Work Cell) by identifying and eliminating waste and non-value-added (NVA) activities/processes.

In the 750 milling/boring work

center, employees used an older vertical milling machine, a boring machine, and other equipment to machine die cast gear cases. The Mazak AJV work center included two Mazak CNCs which performed various machining operations on die cast gear cases, plus related tools. After introductory comments by General Manager George Thomas, the 5S project team members divided into two groups, each one evaluating one of the work centers.

They observed operations, took notes, timed operations, noted sequence steps, and drew spaghetti diagrams. Next, they brainstormed ideas for improving process flow, safety, and efficiencies. Then it was time to prioritize suggestions and assign responsibility for specific tasks.

"Each team worked with area operators to identify tools, equipment, and materials that were not needed in the work cells," said Martin Kopp, Bison's continuous improvement manager. "These items were then removed from the work cells. Others worked on the assigned responsibilities from the brainstorming sessions."

During the first afternoon and

ACCO Brands, Wheeling, IL is North America's largest manufacturer of office supplies, serving major super stores and wholesale businesses.

Bison Gear and Engineering Corporation, St. Charles, IL is a \$40 million manufacturer of gear motors and speed reducers for OEMs and for applications sold through distributors. Approximately 200 people work at the facility, which recently launched a 5S program.

Elgin Sweeper Company, Elgin, IL is the premier manufacturer of street sweeping equipment. The operation is part of the Federal Signal Environmental Products Group.

the next one and a half days, teams tried ideas from their brainstorming sessions, modifying (sometimes several times) processes where the changes seemed beneficial. "Time studies and measurements were used to verify the implemented changes. Also, all changes were reviewed with the appropriate operators before final implementation in order to receive their buy-in and support," Kopp said.

At the end of the third day, the 5S teams selected spokespersons and made presentations to management. Kopp offered summaries of their results:

Results in the 750 Milling/Boring Work Center

"One of the main obstacles was that aluminum chips being cut off the milled casting flew up to 15 feet coming off the vertical mill," according to Kopp. "After several failed

attempts, the team finally developed a shroud to confine these hot chips within three inches of the mill head. This made possible the reconfiguration of the machines and process steps. It also eliminated a safety hazard and helped reduce cleanup time at the end of each shift." Other changes in the milling/boring center (see the team in Figure 1) included:

- One process step – blowing off the casting after the oil plug hole was tapped – was eliminated.
- Moving air lines and an electrical cord reduced operator movement and eliminated tripping hazards and an overhead hazard.
- New (labeled) shadow boards housed setup tools; all other tools and equipment were labeled and assigned addresses.
- A vacuum provided at the line expedites chip cleanup.
- Square footage and linear

footage operator moves required to complete a machining cycle were halved.

- Machining/boring process cycle time decreased from 15 minutes to 11 minutes.

Mazak Area Work Center Improvements

Over in the Mazak work center, the 5S team of internal and external participants (Figure 2) also racked up gains:

- Moving the drill press tables and the workbench eliminated extra operator steps; clutter disappeared and work flow improved; the reconfiguration decreased operator steps to the drill press for the tapping operation.
- Designated areas marked incoming, finished, and in-process materials.
- Four empty drums were removed; the remaining oil drums are labeled and they are in a less congested area.
- Labeled workbench drawers give every item a home location; operators opening a drawer can see where things are and if something is missing.

"To do" list items generated during the event have been assigned to Bison employees for followup, Kopp said. For example, the Mazak team called for fabrication of shields on one of the Mazak CNCs to prevent coolant spillage. "One of the steps in the 750 area requires the operator to use a rotary tool to remove flashing from the casting," Kopp continued. "After questioning why we received those castings from our vendor with flashing, Bison's procurement manager was contacted, and is now working with the supplier to eliminate the flashing from the incoming castings, eliminating a process step."



Figure 1. Bison Gear & Engineering's 5S team participants in the 750 milling/boring work center included (left to right, Brian Steele, Lebanon Seaboard Corporation; Wayne Togtman, Guernsey Bel, Inc.; and Marty Kopp, Jim Hennessey, and Victor Kaljas, all of Bison Gear.



Figure 2. The Mazak team at Bison Gear & Engineering 5S team members were (left to right, Dan Pinderski, ACCO; Dee Hickey and Art Smith, Bison Gear; Kathy Bober, Parco Foods LLC; Chuck Krug, Guernsey Bel, Inc.; Tim Bragg, North American Signs, Inc.; Gabriel Marrero, Bison Gear; and Dave Harp, Lebanon Seaboard Corporation.

Bison Follow-Up and Lessons Learned

High visibility of 5S activities will help to build improvement momentum. Top management involvement and audit checklists plus cleanup checklists with assigned responsibilities will sharpen focus on these efforts, Kopp said.

"We found that the inclusion of people from outside Bison was extremely helpful," he added. "Not only do they bring their experience to the team, but also question the validity of practices that we performed because 'that's the way we have always done it.'"

Including operators from the areas targeted by a 5S process in the event is essential for a successful project. "We are there with the purpose of making their jobs easier while simultaneously helping us save resources, eliminate non-value-added (NVA) practices, and ultimately

compete better in the marketplace," said Kopp. "There is sometimes the tendency to look at a 5S event as a disruption to manufacturing. In Bison's case, management is committed to the 5S efforts, realizing that short-term pain is greatly offset by the long-term gain. After witnessing the tangible improvements of our earlier 5S events, most people in our organization believe our investment in the program will pay daily dividends. By formulating cleaning and maintenance checklists, securing operator support, and implementing regular 5S audits with management participation, we believe we can not only maintain our gains, but also use the 5S program as a stepping stone for even greater improvement throughout our organization."

ACCO Brands' Clip Cell Project

Reduced operator travel time for

wire carriers and operators, establishing a FIFO system for rod (both input and output), assigning specific areas for all items in a Clip Cell, and developing standard operating procedures in the wire mill and tag wire/bulk clip area were goals for a Clip Cell 5S project at ACCO Brands' Wheeling, IL facility. The 5S team working here aimed to improve orderliness and visual management in this fast-paced work area, where millions of paperclips are produced daily. "The Clip Cell consists of the wire mill, wire storage, and the Tag Wire/Bulk Clip areas," said Don Wachter, director of operations.

"Each of the 14 attendees was assigned to a specific project group, and each team focused on a specific area," Wachter continued. "This separation allowed members to focus on the tasks at hand and make some accomplishments. All of the above goals were addressed, and some were completed."

For example, the designation of specific areas for tools and supplies in the tag wire and wire mill was completed. Team members created a FIFO system for the wire carriers. This new system will save more than 1800 sq. ft. of floor space and employee travel distance of 46.88 miles per year.

"There are still items to be done," added Wachter. Creation of standard operating procedures in all work areas is on the "to do" list. The company is evaluating equipment buys such as unique spool handling equipment, based on 5S participants' recommendations. They also plan to finish marking floors and workstations with a color-coded system and to train employees about new procedures implemented during the event to ensure their sustainability.

Elgin Sweeper: Making a Start

Elgin Sweeper in Elgin, IL is

well-known for its street sweeping equipment. Now a part of Federal Signal's Environmental Products group, they began supplying street sweeping equipment in 1914. In one of the event's two 5S projects at the site, company employees and outside participants devised an extensive list of "opportunity" areas after observing and documenting existing processes in a Haas (assembly) cell. Bob Hafey of Flexible Steel Lacing, volunteer facilitator for the team, reported that the creation of PM (preventive maintenance) sheets on equipment could be used as operators and the maintenance employees learned to share accountability for equipment maintenance in the cell.

A machine uptime form was recommended as a useful tool for enabling each shift to see what the previous shift had done. Another recommendation: Move gages to the cell so operators don't waste time looking for them. The team also defined and marked locations for WIP, added descriptions to dispatch sheets, moved job paperwork from the crib to the cell, relocated cabinets and benches, etc. for better work flow, set up a lubricant storage area in the cell, cleaned all equipment and cabinets, and suggested/completed many other improvements. The benefits ranged from improved uptime to less walking time, safer material handling, reduced waiting time, and more.

Meanwhile, in a Gateway Cell (the beginning processes for Elgin's fabrication work), a 5S team targeted better material flow, development of a plan for controlling inventory, and cleanup/organization in the area. Ted Keriazakos of ACCO Brands, also a volunteer facilitator, reported that improvements during the event included lighting adjustments, defining a cleaning supply area, establishing a yellow tag area to stage



Figure 3. Elgin Sweeper 5S team members at work.

equipment and materials to be evaluated, marking a sheet lifter as to which direction it is going, creating staging areas at the press brake for red ticket hot jobs, labeling die sets at the brakes, and moving cabinets at a 225 punch closer to a 354 shear. Many items such as standardizing die sets at the brake awaited further action. The team tagged unneeded carts, bins, chairs, etc. for removal from the work cell. Keriazakos indicated that lessons learned in this project included the need to communicate up-front with operators in the area selected for 5S work, and that planning about how to go about 5S projects and who will participate is time well spent.

Having two 5S projects in the works at one time "gave us an opportunity to experience the good and the bad of the process," according to Federal Signal Environmental Products Group President Shawn Casey. "In one case, the event went off as it

was generally planned with good results while the other was not initially successful. A key learning from our event was that we needed upfront identification of employee participants, plus education and training as to the purpose and intent of the event, and involvement of all employees who directly and indirectly support the manufacturing conversion process. On a positive note, this experience allowed our people to see the critical differences as to what constitutes a good event and what causes less-successful results.

"The thing 5S does for us is to bring perspective, focus, and intensity at one time and one place for dramatic process improvement," Casey continued. "Continuous improvement is nice, but is dependent upon resource constraints and timing. 5S forces you to deal with these constraints at one time with the imperative to measure, then make improvements. Feedback is relatively imme-

diate for all people involved in the process. It also results in a fair amount of follow-up work. In turn, it gives people a blueprint of what to focus on to improve the process event more. I anticipate that we will use 5S methodology throughout all businesses in the Federal Signal Environmental Products Group for the foreseeable future. To do this, we need to establish a team of experts who can move from place to place to act as facilitators of the process. We believe we have gotten a start on this."

Jim Feltes, manufacturing manager at Elgin Sweeper, noted that managers met with all operators in the two work centers where the 5S events were held and asked for their suggestions about training requirements for standardizing color codes used in marking tool/equipment/materials locations and other changes recommended during the workshop. An internal consultant is also working with the Elgin employees on plans for assuming more accountability for

About 5S

Wondering what 5S is all about? Here's a short version:

*Sort: Remove all items from the workplace if they are not needed for current production or clerical operations.

*Set in order: Arrange needed items for ease of use, and label them so that anyone can find them and put them away.

*Shine: Keep everything swept and clean.

*Standardize: Properly maintain the sort, set in order, and shine concepts.

*Sustain: Make a habit of properly maintaining correct procedures.

housekeeping and work flow in their own work areas. The operators also selected a chassis line for another 5S project.

Operators liked the training in 5S basics, to help them simplify their day-to-day tasks, Feltes said. He added that 5S "turns on a light bulb for more improvements, fitting in well with kaizen techniques for long-term progress."

Editor's note: The assistance of Martin Kopp, Bison Gear; Don Wachter and Ted Keriazakos, ACCO Brands; Bob Hafey, Flexible Steel Lacing; Shawn Casey and Jim Feltes, Elgin Sweeper in the development of this article, and the hospitality of employees at host sites are appreciated. The Cumberland Group led the 5S event training and facilitation.

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