



Heavy metals, a contaminated site and increasingly stringent environmental guidelines have not kept this Michigan-based Siemens plant from becoming a real symbol of sustainability in action. Here's why...

One of the great attributes of sustainability is its inclusiveness: Everyone can do something to make a difference. But reaching the long-term, deep-rooted level of participation required for industrial organizations to make a difference is often easier said than done. Heavy manufacturing operations like steelmaking, shipbuilding and others, for example, can find long-term sustainability a serious challenge, in large part because of their oversized demands on resources. Gigantic machinery, high temperatures and harsh chemicals do not conveniently meet the requirements of energy efficiency and environmental friendliness.

Fortunately, this has not kept heavy industry from making sustainability a goal. A good example is Siemens' Metallurgical Services in Benton Harbor, MI. This 90,000-sq.-ft. operation near Lake Michigan, one of 11 Offline Maintenance facilities that Siemens runs in North America, refurbishes heavy equipment for the metals industry. It obtained ISO 14001 certification for its adherence to world-class environmental management standards in December 2010. This achievement was meaningful not only because of the plant's difficult type of operations, but because it had overcome the inconsistent environmental practices of its past. Now, the site's 60 employees support a sustainable culture—and *routinely seek out ways to become even greener.*

“We started looking for lean/green opportunities in our business process models several years

Written by Rick Carter, Executive Editor
Thursday, 14 July 2011 09:27

ago,” says general manager Keith Rapp. “And when we became part of the Siemens family [in 2006], we were motivated to pick up the pace.” That motivation included pursuit and attainment of ISO 14001, along with rigorous recycling initiatives that ensure none of the plant’s wastes harm the environment or its workers.

A murky start

The Benton Harbor operation provides one main service: maintenance and coating of the casting molds steelmakers use to shape and deliver their product. “We refurbish their continuous-casting molds along with the various coatings that are applied to the copper liners on these molds,” Rapp explains. The molds—*each up to 30 ft. long and weighing as much as 55,000 lbs.* —make frequent round trips between Siemens and its customers, located mostly in Canada, Ohio, Illinois and Indiana. Due to their rigorous use as a receptacle for molten steel, the molds last only about eight weeks on the job before refurbishment is needed. Some make it only two weeks.

To refurbish the molds, Benton Harbor removes the wear layer at the bottom of the mold and replaces it with a fresh, smooth layer of alloyed nickel-based coatings. The several-day process involves plating baths and acid and chemical byproducts. It also creates high volumes of scrap-metal waste, along with airborne particulate matter caused by grinding out the molds. When Rapp started at the plant in the mid-1980s, there were fewer environmental regulations in place and less awareness of their importance. “We had no defined environmental quality system,” he recalls. “Nobody knew what ‘green’ meant or what a carbon footprint was.” The shop was dirty. Waste was simply hauled away, not recycled. Add to this the numerous environmental transgressions that had taken place at the 75-year-old site—*including chemical spills and mishandling of waste oil* —and the Benton Harbor facility would seem to have been an unlikely candidate for positive recognition of any kind.

But things took an unplanned turn for the better at the site soon after Rapp began working there. A new owner’s due diligence uncovered severe groundwater contamination at the site, which, in turn, involved the EPA. “This required us to install a biological remediation system and do periodic inspections and testing of the soil and water to ensure we weren’t contributing to the problem,” says Rapp. He points to this as the company’s first real awareness of its need to “step up and watch what we’re doing here to improve the environment.”

Before Siemens took over the operation in 2006, the sites’s environmental improvements had been noteworthy, but not exceptional. The corporation was quick to change that going forward. According to Jim Chevrette, the plant’s environmental health and safety (EH&S) officer, without

On The Road To Sustainability: A Profile Of Siemens Metallurgical Services

Written by Rick Carter, Executive Editor
Thursday, 14 July 2011 09:27

making any personnel changes at the facility, Siemens mandated that environmental initiatives be given more weight in all aspects of Benton Harbor's operation. A 15-year veteran of the site, Chevrette knew what had to be done. "When I started, there were no initiatives with regard to recycling or waste minimization," he notes. "Nothing like we do today."



Steelmakers' molds await work on Benton Harbor's main shop floor. The plant refurbishes about 1000 annually for customers in North America.

The path to 14001

Benton Harbor's increased emphasis on sustainability led to the pursuit of a structure to support it. Chevrette says the idea to make sustainability part of company strategy crystallized for him when he contacted Michigan's Retired Engineer Technical Assistance Program (RETAP) at an environmental conference. Michigan had established this no-charge, forward-thinking program to help in-state businesses prevent pollution, reduce waste and conserve energy ([see below for more info](#)

). After a RETAP site evaluation at Benton Harbor, several of the group's recommendations were put in place. These included establishment of an environmental affairs team (now called the Environmental Cross-Functional Team); tracking and monitoring of utility and waste-disposal costs; establishment of recycling programs for lamps, paper and other items; and replacement of harsh, naphtha-based cleaners with aqueous-based products.

On The Road To Sustainability: A Profile Of Siemens Metallurgical Services

Written by Rick Carter, Executive Editor
Thursday, 14 July 2011 09:27

As Chevrette remembers, “We really got rolling in the right direction after the site evaluation and follow-up from RETAP.” It was then that pursuit of environmental gold for business operations—*ISO 14001 certification*

—suddenly seemed to make sense. In light of the green steps the plant had already taken and its in-place ISO 9001 certification, he reasoned that the next level was within reach.

“Our ISO 9001 was very mature, so going for 14001 was not difficult,” says Chevrette. With 9001 in place more than 10 years, “half the struggle with 14001 was already taken care of,” he notes. “It’s not like we started from scratch.” And with additional guidance from other 14001-certified Siemens facilities, the Benton Harbor team was able to use procedures and documents that were already in place. Their biggest challenge, says Chevrette, may have been their attempt to complete certification in record time. “It was an aggressive timeframe. We achieved it in about half a year, which is a third of the time normally spent doing this. But we had everything in place and we had the right people. That’s the key: People that are motivated and willing to put the effort into getting this done.”



Benton Harbor’s workforce has actively embraced sustainable strategies since Siemens bought the operation in 2006. Current initiatives involve relamping and making the plant “landfill-free.”

Written by Rick Carter, Executive Editor
Thursday, 14 July 2011 09:27

14001 and beyond

Benton Harbor's pursuit of sustainable operations did not end with its 14001 certification. One sustainable project currently underway is a plant-wide relamping initiative that Rapp characterizes as "the biggest thing we're doing now." Scheduled for completion in September, this work involves relamping—*replacement of 1000-*

and 400-watt metal-halide lamps and T-12 fluorescent units with a combination of T-5 and T-8 lamps and electronic ballasts—and rewiring, including adding occupancy sensors, photoelectric cells and/or timers. The project is expected to produce annual electrical lighting savings of 25%, with payback in four years or less.

Another ongoing project is Benton Harbor's plan to become a "landfill-free" operation. "This means that none of what we throw out goes to landfill," says Chevrette, who learned of the approach at a Siemens conference. The plant currently sends 90 tons of trash to landfill annually, he says, a figure that does not include process waste or non-paper trash like pallets and packing crates, which are already recycled. The landfill waste comes "from the wastebaskets and out of the shop," he says, "so we will recycle what we can, and what cannot be recycled will be sent to companies that will burn it to create energy to make electricity."

Benton Harbor has also made sustainable gains in its industrial processes by using Siemens' drive technology. "With this, we expect to save substantial amounts of process material in one of our coating lines because we can better monitor and control the energy that's going to the parts and the process," Rapp points out. "Instead of this equipment running 24/7, we can control it, which allows the amperage to drop off when it's not needed."

And due to the company's use of heavy metals in its plating baths, there also has been a new focus on waste byproducts. In addition to recycling 100 tons of copper, nickel and steel annually, "we now run the acids and chemicals that are a byproduct of our process through a filter press," says Rapp. "We have an internal water-filter system where we clean the water, run it through a filter press and the pure water can be sent to the city." The water is tested on-site by both the plant and the city.

The nickel-heavy sludge removed from the filter press is 100% recycled. "It's picked up by a company that reclaims the nickel," Rapp notes. Other deposits in the sludge, such as lime, are reclaimed for use as road-sealant additives.

Chevrette says that the plant has also cultivated positive relationships with regulators, so it

Written by Rick Carter, Executive Editor
Thursday, 14 July 2011 09:27

stays on top of various state and federal regulations for waste discharge, chrome scrubbers, nitric scrubbers, stormwater permits and on-site oil storage. Partly because of the detailed accountability needed in areas like this, the plant has enacted another initiative for sustainable efficiency. Its plan is to integrate the various procedural guidelines currently used in Benton Harbor—*ISO 9001 and ISO 14001*—with another (OHSAS 18001, an international occupational health-and-safety specification) into one streamlined, non-redundant system. Completion is expected by September 2012. Again, Benton Harbor will be ahead of the curve thanks to its world-class safety record that includes more than three years without a single lost-time accident. This accomplishment was recognized last fall when the plant won the Michigan Occupational Safety and Health Administration's Gold Award.

For Chevrette, the pursuit of sustainability, energy efficiency and environmental health and safety, in particular, comes naturally. "It's one of my interests," he says, "and I've kind of been pushing the guys, but it's a team effort. The whole shop is involved." And he notes that the involvement goes beyond the needs of the plant. A recent "Bring Your Junk to Work Day," for example, was established to help employees recycle unwanted home electronics. "Many employees responded," says Chevrette, "and we donated the material to a recycling organization here in town. We also promote in the plant with posters and ideas on safety boards reminding workers what they can do at home."

Despite their connection to what some may see as a difficult-to-predict industry, Rapp and Chevrette see greater things ahead for Benton Harbor and its sustainable initiatives. "Our certification to the ISO environmental standard is just the beginning," says Chevrette. "We look forward to growing bigger and better from this point forward in everything we do." Besides, he says, "I don't see an alternative for steel just yet. I think it's going to be around for awhile." **MT**

One State's Sustainable Assistance

Michigan's Retired Engineer Technical Assistance Program—RETAP—was established in 1996 to help in-state businesses and institutions prevent pollution, reduce waste and conserve energy. Michigan's Department of Environmental Quality administers the program. The core of RETAP assistance is to offer on-site pollution prevention and energy-conservation assessments to in-state businesses and institutions. Assessment teams are comprised of retirees from many Michigan industries willing to apply their skills, expertise and time to assess potential pollution and waste problems and provide recommendations for improvement. The assessments are performed only at the request of an organization (and at no cost to that organization). A confidential report is provided only to the assessed business or institution.

RETAP doesn't enforce compliance with any regulations: Implementation of its

On The Road To Sustainability: A Profile Of Siemens Metallurgical Services

Written by Rick Carter, Executive Editor
Thursday, 14 July 2011 09:27

recommendations is entirely voluntary. Acceptance of the offered assistance is evidence of a good-faith effort at waste reduction and pollution prevention, and may ease the process for the business or institution to become eligible for low-interest pollution-prevention loans from the state of Michigan.

Source: Michigan Department of Environmental Quality, 2011.