

# Geneva Steel: From Dinosaur to Modern Mill

**A**s hokey as it sounds, this started out largely as a community service project," said Joe Cannon, CEO of Geneva Steel and former U.S. Environmental Protection Agency (EPA) assistant administrator for air and radiation. "This" was the 1985 purchase of a steel mill that sprawls across some 1800 acres of Provo, Utah and employs some 2000 people. And, what started out as a community service project has evolved into an exceptional example of pollution prevention and industrial modernization.

The story of Geneva Steel is an industrial Cinderella tale. Built during the Second World War and owned since 1946 by USX and its predecessor, U.S. Steel, the Utah plant was by the mid-80s one of the dinosaurs of the U.S. steel industry. The plant's open hearth furnaces spewed thick red smoke into the Utah Valley, but it also employed thousands of Utah workers who saw their financial futures "going up in smoke" when U.S. Steel announced it would shut down its Geneva plant.

There was little to recommend the Geneva plant to new owners, Cannon admits. "Everything needed modernizing. Everything," he said in an interview with *Pollution Engineering*. The site was littered with contamination — the predictable legacy of the plant's 40-year life — and future plant operations would fall squarely under environmental protection regulations, some of which Cannon himself had been instrumental in developing. U.S. Steel's price tag for the Geneva plant was a tooth-rattling \$58 mil-

lion and, perhaps most daunting, the giant steelmaker set a brutal deadline by which the plant would be sold. Until that deadline, U.S. Steel agreed to keep its coke ovens operating in a "standby" mode. If the ovens were allowed to cool, they would be so severely damaged that bringing the plant back on line would be financially impossible.

The eventual purchase of the mill by Cannon and a group of investors is one of the David-and-Goliath sagas of American business, but the pollution prevention part of the story begins when the new owners of Geneva Steel set to work transforming a steel dinosaur into one of North America's most environmentally responsible steel mills.

## Controlling discharges

The first issue Cannon and his partners faced was compliance with the PM10 limits imposed by the Clean Air Act. The situation was properly ironic, admitted Cannon, "It was probably one of the few times when the person who was responsible for developing the regulations found himself on the other side, having to figure out how to comply with them." The Geneva plant's ancient open hearth furnace lay at the heart of the problem, and, according to Cannon, "We knew we were going to have a PM10 problem, so we started thinking about 'widgets' — baghouses, strippers, technologies — to control the problem." That quick thinking gave way to a more fundamental focus. Explained Cannon, "Instead of controlling the problem, we wiped out the open hearth, and that

produced an astronomical reduction in particulate."

The open hearth furnace was replaced with \$80 million Basic Oxygen Process (Q-BOP) furnaces. The new furnaces employ oxygen, rather than air, to virtually eliminate the conversion of nitrogen from the combustion process into nitrogen oxide and, eventually ni-

that captures sulfur dioxide emissions and converts them into solid elemental sulfur, which is then sold to manufacturers of fertilizer and other products. Each day, five tons of sulfur are produced by the system, producing a 95 percent reduction in the plant's daily sulfur emissions. While these two new systems successfully prevented the release of massive volumes of PM10, other systems also contributed to the plant's overall emissions reduction, including the baghouse filtering system — a "widget" — attached to the sinter plant, which lowers PM10 emissions by 43 percent and an \$8 million benzene gas blanketing system, which traps and contains benzene emissions. Since the systems were completed in 1991, Geneva's benzene emissions have sunk to below the detectable limit, representing a drop of 98 percent.

Similar improvements have been demonstrated in the control of pollution in other media, particularly wastewater. The "Bug Plant," a biological wastewater treatment plant, was the first major environmental facility brought on line at the Geneva site after the plant's purchase from U.S. Steel and, ironically, employed a proprietary treatment process developed by U.S. Steel. According to Cannon, the new owners negotiated with U.S. Steel to license the technology and employ it in its first full-scale application at the Geneva site. The treatment process relies on microorganisms to consume pollutants, especially ammonia, in plant wastewater, allowing the recycling of some five million gallons per day of water back into the

**"Don't  
generate  
pollution in  
the first place,"  
was the key to  
the mill's  
modernization  
program.**

trates. The furnaces also are totally enclosed and equipped with a vacuum system that captures and filters particulate. The result: Geneva's Q-BOP furnaces have reduced nitrogen oxide emissions by 95 percent. But, PM10 is not controlled by Q-BOP alone.

Produced as coal is converted into coke, sulfur dioxide also contributes to the formation of PM10 — and required control. That control came in the form of Geneva's coke oven gas sulfur removal system, a \$20 million system

# POLLUTION PREVENTION

plant. Said Cannon, "The water has to be clean, not only for environmental reasons, but in order for it to be reused in the plant."

## Integrating environmental awareness

The nuts and bolts of Geneva's evolution from dinosaur to modern steel mill are evident in the new facilities and treatment systems. But, underlying those nuts and bolts is a unique perspective toward environmental responsibility, according to Cannon. "When

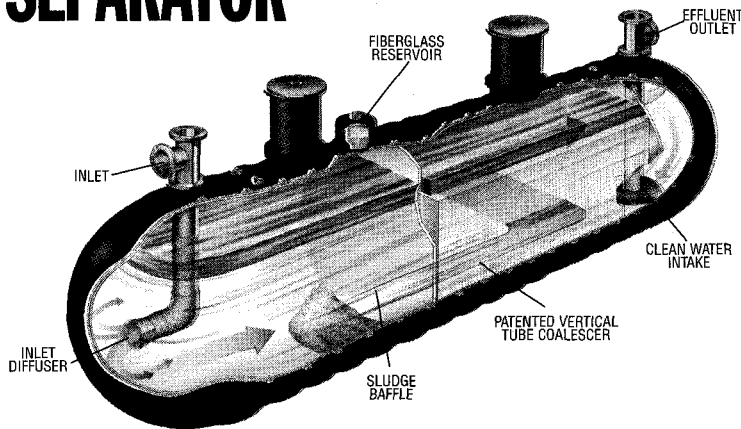
we bought the mill, we were all 37 years old. We were way young, and our perspective toward environmental issues was pretty well developed. We bought this mill and everything needed to be fixed, so we had a unique opportunity to integrate that environmental perspective into modernizing the plant."

Key to that perspective was a basic premise: don't generate pollution in the first

place. Putting that premise into practice meant setting priorities for the plant's modernization program. Said Cannon, "We could have done other projects first, and there was some pressure from some of our investors to pay more immediate attention to strict production issues instead of looking at the broader picture." Instead of succumbing to that pressure, the new partners took a long view of the plant, its needs and its future. "We planned on being around for a long time." Instead of patching up this system or that piece of equipment, Geneva's owners set priorities that incorporated a strong environmental perspective. Said Cannon, "You can't take that approach unless you're committed to the long term, and you can't put the approach into practice without the commitment of the workforce."

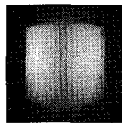
After 10 years in the steel industry, Cannon reflected on his tenure with EPA, noting, "Then, I believed the 'command and control' approach was stupid. I haven't changed my views on that. In fact, my feelings have intensified during the past 10 years. Government ignores the expertise it has in the people who work in industry, and technology-based standards play right into that. My perspective is to set goals, and then to let the genius of the people come up with solutions. I used to preach that at the Agency, and, at Geneva, we have dozens of examples of our workers coming up with ideas that have made dramatic improvements in operations." It deserves note that Geneva's "improved operations" translate into more than environmental compliance: the mill makes money, 10 years after it stood at the brink of becoming one of Utah's biggest brownfield sites.

## XERXES INNOVATIVE OIL/WATER SEPARATOR



### Why Nothing Equals Our Separators

Xerxes fiberglass oil/water separators meet strict storm water run-off regulations with innovations from the inside out. Our unique, patented polypropylene vertical tube coalescer\* provides



Unique vertical tube coalescer.

greater surface area to attract oily water and reduces the need for maintenance. The inlet diffuser and effluent clean water

intake minimize turbulence and achieve clean water discharge. These and other innovations allow Xerxes oil/water separators to remove free-floating oil droplets equal to or greater than 20 microns and attain a minimum effluent quality of 10 ppm.

### Fiberglass Performance That Stands the Test of Time.

Unlike steel separators, our fiberglass separators are lightweight and eliminate the possibility of internal or external corrosion. With Xerxes unique integral rib design and the highest-quality resin and glass, Xerxes oil/water separators are built for long-lasting performance.

\* Patented by AFL Industries, Inc.

- SEPARATE US FROM THE REST**  
The Xerxes Fiberglass Oil/Water Separator
- Patented coalescer that's easy to maintain.
  - Attains a minimum effluent quality of 10 ppm.
  - Meets or exceeds EPA standards.
  - Corrosion-resistant fiberglass.
  - Single and double wall models 600-50,000 gals.

See Xerxes oil/water separator brochure for more details.

For a fiberglass solution without equal, call Xerxes today (612-887-1890).  
Then see for yourself what separates us from the rest.

**XERXES**<sup>®</sup>  
CORPORATION

7901 Xerxes Avenue South • Minneapolis, MN 55431-1288 • (612) 887-1890 • FAX (612) 887-1882

### Reader Interest Review

Please circle the appropriate number on the Reader Service Card to indicate the level of interest in the article.

High 173      Medium 174      Low 175

## Need to Hire an Environmental Professional?

If your company is looking for an environmental professional, you should consider placing an ad in our **Classified Section**.

**Contact:**  
**Low Bove**  
**at (602) 994-8079.**