

Company

Entergy Corporation

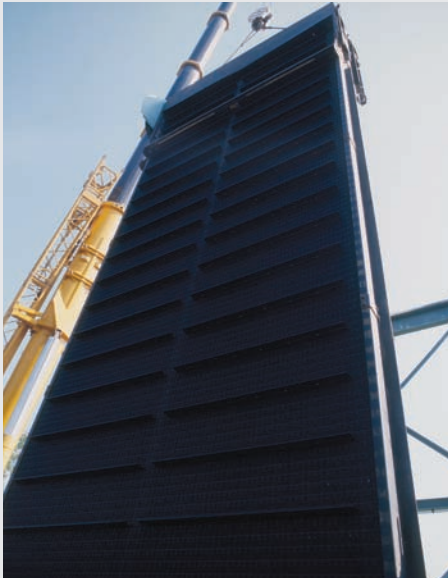
Application

Cooling water intake for power production

Challenges

The abrasive river intake environment caused excessive wear on Entergy's steel carrier chain and basket screens.

As seen in
Power Engineering,
October 2007



Installation of the Series 6000 screen at Entergy's Little Gypsy plant.

Major U.S. Power Producer Tests Hydrolox Traveling Water Screen Solution with Great Success



The spray bar cleans away debris on the working Series 6000 screen.

Entergy Corporation is an energy company that delivers electricity to 2.6 million utility customers in Arkansas, Louisiana, Mississippi, and Texas. Its Little Gypsy plant in Montz, Louisiana, is a natural gas-fired steam power plant. The plant gathers water from the Mississippi River through three intake channels, with a total generating capacity of 1,250 megawatts.

Each of the plant's three units is outfitted with two water screens which, until 2005, were all equipped with traditional steel carrier chain and basket screens, similar to the Link-Belt® design. Entergy's Little Gypsy plant experienced excessive wear with the steel screens due to the abrasive nature of the intake environment where river silt and debris are frequently in contact with the screen.

To experiment with a different screening solution, Entergy partnered with a local company to test Hydrolox® technology—engineered polymer traveling

water screen components for cooling water intakes at power plants. The screens are made of an engineered polymer material which is non-corrosive and provides extreme resistance to wear, impact, and fatigue in abrasive environments. Hydrolox polymer screens have proven to outlast the life of traditional steel screen components by two or more times in a variety of water-screening applications.

Hydrolox water intake screens also feature unique design characteristics. Where traditional screens are edge-driven, concentrating the load on carrier chains, Hydrolox screens employ a positive drive system. Sprockets are installed along the entire head shaft to distribute the load across the width of the screen, eliminating uneven wear. Additionally, the Hydrolox screen design features no submerged moving parts, completely eliminating the carrier chains and foot-shaft sprockets of traditional screening technology.

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In April 2005, Entergy replaced an approximately 14-foot-wide, 53-foot-deep steel screen with Hydrolox's Series 6000 screen mesh to test the technology against their biggest circulating pumps. The prototype screen, equipped with debris-handling flights, was installed at the most abrasive point of the intake, where debris is the heaviest.

After installation, the prototype screen mesh was monitored by Hydrolox for operational feasibility, including its performance flow characteristics and the pressure differential across the screen as compared to the traditional technology. Hydrolox also monitored the durability of the screen polymers by analyzing wear patterns and predicted screen life based on that analysis.

A newly designed spray header system was installed on the screen to facilitate debris removal from the polymer material. The system was also observed to measure the effectiveness of debris removal from the screen's mesh holes, which are smaller in size than traditional screen mesh. Hydrolox Series 6000 mesh holes are almost square in shape, measuring .25 in. x .30 in.

In addition to frequent on-site inspections, Hydrolox installed a remote monitoring system to observe the following: the wear of the screen mesh; the active tensioning system that reacts to mesh elongation in temperature changes; and the head differential across the screen. The remote monitoring system included a camera for real-time observation with streaming video of debris events. Additionally, sensors were installed to detect any broken screen mesh or debris-handling flights.

In June 2006, the prototype was replaced with a Series 6000 production version

which featured new module design enhancements: the sprocket design and material were modified to extend the life of the mesh; the mesh pattern was redesigned to improve the load-handling capacity of the screen; the debris-handling flights were redesigned to optimize cleanability.

Hydrolox also developed a foot section for better seal and less passage of debris through the bottom of the screen frame.

Entergy's Little Gypsy plant has reported great success with the new screen installation—success that is evident in the minimal amount of maintenance the screen has required for operation. The run frequency of the screen varies by season. Since the initial installation of the prototype, the screen has run 2,500 hours maintenance free.

Danny Vicknair is the Entergy Maintenance Technician at Little Gypsy and the "Subject Matter Expert" for the Mississippi River intake equipment. He has reported significant benefits of using Hydrolox screening technology. The polymer screen material surpasses the steel screens in strength and durability, he says: no real screen wear has been reported.

Don McCrosky, Little Gypsy Plant Manager, has also recognized the benefits of using this technology. "Based on what we've seen, we believe that the Hydrolox screen will last two times the life of our conventional screens. The cost savings from decreased manpower will allow us to use our resources for other projects in the plant."

In addition, the wash-nozzle system of the Hydrolox screen is far superior to conventional screens. "It's good to



know that somebody has come up with a better design for the wash nozzle," Mr. Vicknair said.

Entergy has been so pleased with the durability, low maintenance, and reliability of the screen that they are budgeting to replace their other five existing screens on the three intake units with the same technology.

In addition to screen quality and performance, Entergy has been pleased with the level of planning that Hydrolox invested in their project, which also contributed to a very easy installation process.

"I am extremely pleased with my experience of working with Hydrolox as a company—that's the best part of the whole project. I can't think of any area that needs improvement from a customer standpoint," said Mr. Vicknair.

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