

Hydrolox Traveling Water Screens for Fish Protection Successfully Demonstrated at Alabama Power Company

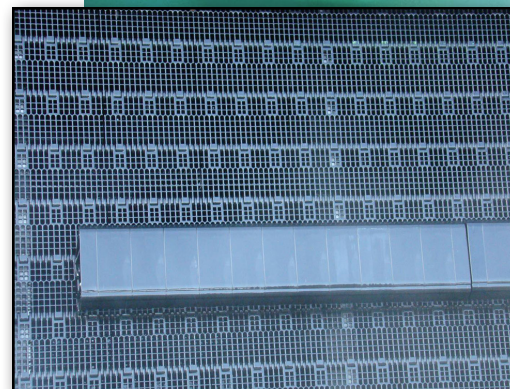
Utilities Seek “Fish-Friendly” Compliance Options in Anticipation of New Fish Protection Regulations

In 2013, U.S. electric utilities were awaiting the issuance of the Environmental Protection Agency Clean Water Act Section 316(b) final Rule. Proposed versions of the Rule indicated that it might allow power plants with cooling water intake structures (CWIS) to use “fish-friendly” modified traveling water screens and fish return structures as the best technology available for the mitigation of fish and shellfish impingement. Although some utilities had already installed traveling water screens at their CWIS that met the “fish-friendly” criteria, these screens typically were large and constructed from heavy steel. An innovative new screen design had become available that also met the “fish-friendly” criteria. The Hydrolox™ traveling water screen is composed of engineered polymers assembled in an interlocked brick-laid pattern. The polymer material significantly reduces screen weight and friction, the screens do not corrode as metal screens would, and they have a much smaller footprint. In addition, the top of the screen is cantilevered, which makes it easier to remove fish and debris and transfer them to a fish return trough.

Alabama Power Company—a subsidiary of Southern Company—had already installed one Hydrolox™ screen at its CWIS at Plant Barry. The plant is located on the Mobile River in Alabama, which contains significant amounts of debris as well as many species of fish that could become impinged on the CWIS. Due to the large amounts of debris, traditional screens at Plant Barry have to be overhauled every 2-3 years. However, the Hydrolox™ screen had successfully operated for five years without any maintenance issues. EPRI and Alabama Power decided to collaborate on a study in which the utility would retrofit all of the screens on one of its CWIS at Plant Barry with Hydrolox™ screens equipped with fish collection features. The single Hydrolox™ screen already installed did not have these additional features. The goal of the study was to evaluate whether continuous operation of the retrofitted screens could meet the required annual average fish mortality limits established in the final 316(b) Rule. Dairyland Power Cooperative, Luminant Power and Omaha Public Power District (OPPD) also collaborated on the study. “We have heavy debris and fragile fish issues at our plants and we felt this was a good opportunity to support the research of a cutting edge technology that could benefit the entire industry,” says Bradley Foss, Senior Environmental Biologist at Dairyland.

“We learned a lot about how to use the Hydrolox screens and will apply that information to our other facilities.”

~ ***Jonathan Ponstein,
Alabama Power Company***



Hydrolox molded polymer screen with fish collection bucket (photo compliments of Alabama Power Company).

Challenge

Electric power companies wanted to evaluate the new Hydrolox polymer traveling water screens as a potential option for fish protection and debris management.

Solution

Alabama Power Company retrofitted all of the screens in one of its cooling water intake structures at Plant Barry with Hydrolox screens and also installed a fish collection box and survival facility.

Results and Benefits

The Hydrolox screens effectively routed the majority of fish and debris into the fish return system which will remain in place at Plant Barry.

This was the first time an entire cooling water intake structure in the United States was installed with Hydrolox™ screens.

The demonstration established a baseline to support future EPRI demonstrations of how to optimize the screen's performance to comply with new regulations.

Hydrolox™ Screens Perform Well During One-Year Study

Five Hydrolox™ screens were installed in May 2013. EPRI designed and fabricated the fish collection system and a flow-through latent impingement mortality system to evaluate fish survival. The study period encompassed a full year and included 53 different fish species, including channel catfish, threadfin shad, bay anchovy, bluegill and hogchoker. Ninety-two percent of the fish and 89% of the debris in the CWIS were returned to the fish return trough. The screens had minor operational issues and remained in place when the study concluded in May 2014. During the study, staff from Luminant, Dairyland and OPPD visited Plant Barry to observe the operation of the screens and the fish return and collection systems. According to Ron Stohlmann, a Lead Mechanical/Civil Engineer for OPPD, "Seeing a piece of technology installed in an actual plant situation is invaluable from the operations side because we can see how the screen operates and learn from the operators."

In addition to gaining valuable information about the operation of the screens, the fish survival information obtained from the study significantly extended the knowledge base on how these screens perform and on how fish management survival studies are conducted. The screens at Plant Barry will have to be optimized to meet requirements of the final 316(b) Rule issued in May 2014, and this project established a baseline to support future EPRI demonstrations of how to optimize the performance of Hydrolox™ screens.

Six individuals received an EPRI 2014 Technology Transfer award recognizing their leadership in sponsoring the first installation of the Hydrolox traveling water screens in a utility cooling water intake structure: Justin Mitchell and Jonathan Ponstein from Alabama Power Company, Bradley Foss from Dairyland Power Cooperative, Gary Spicer from Luminant Power, and Russ Baker and Ron Stohlmann from Omaha Public Power District.

Related EPRI Products

Title	Product ID
Hydrolox Traveling Water Screen Fish Impingement and Survival Case Study-Plant Barry Generating Station	3002005832
Design of Fish Return Systems and Operations/Maintenance Guidelines	3002001422
Ristroph-Modified Traveling Water Screen Fish Impingement and Survival Case Study at Plant Gorgas Generating Station	3002003380
Cooling Water Intake Structure Fish Protection Reference Manual	3002000231

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com)

CONTACTS

Douglas Dixon, *Technical Executive*
607.869.1025, ddixon@epri.com

Electric Power Research Institute

3420 Hillview Avenue, Palo Alto, California 94304-1338 • PO Box 10412, Palo Alto, California 94303-0813 USA
800.313.3774 • 650.855.2121 • askepri@epri.com • www.epri.com