Con Edison and EPRI Develop Dual Flow Traveling Fine Mesh Screening System for Fish Protection

Consolidated Edison Company of New York (Con Edison) needed to upgrade the water screens at its East River Generating Station in Manhattan. The plant withdraws water from the East River for cooling and the screens reduce entrainment and mortality of fish, shellfish eggs, and larvae by keeping them from entering the cooling water intake structure. The screen upgrade was mandated by the New York State Department of Environmental Conservation (NYSDEC) as a condition of Con Edison's State Pollution Discharge Elimination Discharge System (SPDES) permit. Con Edison asked EPRI to provide guidance on the screen mesh size, how to design and locate the fish return system and the most effective way to install the screens. The company replaced its existing screens with five dual flow traveling water fine mesh screens and was able to modify its existing fish return system rather than installing a new one. EPRI also provided Con Edison with documentation to help NYSDEC determine that the upgraded screens and fish protection system met the SPDES permit requirements. This is one of the first dual flow fine mesh screens systems installed at a United States power plant.

Con Edison Requests EPRI Assistance in Designing and Installing Upgraded Fish Protection System

Con Edison's East River Generating Station in Manhattan contains two once-through cooling units that generate electricity and steam. The plant withdraws significant amounts of water from the East River through its cooling water intake structure. Con Edison installed dual flow screens in 1989 to reduce entrainment and mortality of fish, shellfish eggs, and larvae in the vicinity of the plant. In 2009, the NYSDEC mandated that Con Edison upgrade the screens at the East River Station as part of its SPDES permit. The New York state SPDES program is focused on eliminating pollution and ensuring the quality of New York waters through, among other things, protection and propagation of fish and wildlife.

"EPRI's advice on fine mesh screen sizing, material and fish return orientation helped us implement the most cost-effective solution."

~ Gary Thorn, Con Edison

The upgrade mandated by NYSDEC required Con Edison to install dual flow Ristroph-style screens with fine mesh material. Organisms captured on the screens are removed by a low-pressure spray wash and returned to the river through a fish return system. Although Con Edison had already decided which screens to install, they requested EPRI's guidance in implementing the project. "EPRI gave us advice on fine mesh screen material, fish return arrangements and insight on how to set up the screens from an operations standpoint," said Gary Thorn, Con Edison's Section Manager of Steam Plant Projects. In addition, EPRI worked with Con Edison in understanding and implementing the expected requirements of the U.S. Environmental Protection Agency Clean Water Act Section §316(b) Rule for fish protection at existing facilities, since the plant is subject to both federal and state regulatory requirements.

Con Edison installed dual flow Ristroph traveling water screens at its East River Generating Station

Challenge

Con Edison needed to replace the cooling water intake structure traveling water mesh screens at its East River Generating Station to comply with a New York state permitting requirement.

Solution

EPRI helped Con Edison select the best mesh size and design a new fish return system.

Results and Benefits

Con Edison and EPRI installed Ristroph Style Dual Flow fine mesh screen systems.

Con Edison received the necessary permit from the New York State Department of Environmental Conservation.

Collaborating with EPRI on the new system resulted in substantial cost savings.

Con Edison Achieves Compliance with State and Federal Fish Protection Requirements

Con Edison replaced the four existing screens with five Ristroph Style Dual Flow traveling water fine mesh screens. The company also modified its existing fish return system rather than installing a new one at a different location relative to the screens based on EPRI's advice, resulting in substantial cost savings. EPRI provided documentation that Con Edison shared with NYSDEC to verify that the fish return system met regulatory requirements. Con Edison achieved compliance with its SPDES permit for the East River Generating Station and preserving the plant's ability to operate with its existing once-through cooling system in lieu of a potential requirement to retrofit with a closed cycle cooling system that might have forced the plant's closure.

EPRI provided further assistance to Con Edison when one of the new fine mesh screens failed in July 2014. "EPRI worked with them to help conduct a rapid root cause analysis," according to EPRI's Doug Dixon. In addition, Thorn believes that the information EPRI provided to Con Edison will also help the company develop a Verification Monitoring Plan required by New York State proving they have achieved mortality reduction and are returning a sufficient number of fish and larvae back to the East River.

Gary Thorn and Brian Brush are recipients of a 2014 EPRI Technology Transfer award for their leadership in applying EPRI research to redesigning Con Edison's fish protection system at the company's East River Generating Station.

Related EPRI Products

Title	Product ID
Fish-Protection Modified Traveling Water Screens	3002001421
Design of Fish Return Systems and Operations/ Maintenance Guidelines	3002001422
Effects of Distance and Debris Exposure on Survival and Injury of Juvenile Fish within a Fish Return System	3002001467
Engineering and Biological Assessment Fine-mesh, Modified Traveling Water Screen Retrofits	3002001104

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

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