Success Story: Opryland

Markets Served
Electrical distribution

Eaton proves that floodwaters can't stop the music

Location
Gaylord Opryland Hotel and Conference Center, Nashville, Tennessee

Problem
Flooding causes power loss to 2881 hotel rooms and 600,000 square feet of meeting space

Solution
An extensive upgrade of the Opryland powerhouse's protective relaying, metering and control scheme

Results
Because of EESS service capabilities, the Opryland powerhouse was fully operational by the July 1st deadline

Contact Information
www.eaton.com/eess

Background

After two days of unrelenting rainfall in May 2010, the usually thriving Gaylord Opryland Hotel and Conference Center in Nashville was dark and deserted. The Cumberland River had rushed over its banks, leaving 12 feet of water in some areas of the world's largest non-casino hotel.

Fifteen hundred guests were evacuated to a nearby high school, as the owner, Gaylord Entertainment, waited for the floodwaters to subside so that a damage assessment could begin at the Music City landmark. The power supply to 2881 hotel rooms and 600,000 square feet of meeting space was cut off.

Resort management recognized Eaton as an immediate resource for disaster response. Through five Opryland expansion projects spanning 25 years, Westinghouse/Cutler-Hammer® and Eaton equipment had comprised virtually all of the installed base. In addition to supplying the power distribution products, the Eaton service division, Eaton Electrical Services & Systems (EESS), played a prominent role in completing the work.

Challenges

More than anything else, Opryland needed electrical power. The immediate focus was on the powerhouse, which contained 29 kV, 5 kV and 480V switchgear, and served as the workhorse of the facility's entire electrical distribution system. Local District Operations Center (DOC) manager Gordon Short realized that a substantial number of service engineers and field technicians would be required to assess the damage and determine the most effective—and timely—solution.

Solution

An e-mail message was sent that reached every Eaton service office in the United States and Canada. It read in part: ***Please give serious consideration to sending any manpower that you can spare to the Nashville area as it becomes needed***.

Additional recruiting of available Eaton field engineers and technicians had them on site when the floodwaters subsided. They immediately went to work assessing the condition of every piece of electrical equipment in the powerhouse.

Eventually, 40 EESS employees would participate in the assessment and remediation effort encompassing the powerhouse and hotel/convention center complex. A team consisting of senior field engineers conducted a thorough assessment of the equipment as soon as they could navigate through the powerhouse structure.

Bill Cusick, Louisville-based regional service marketing manager, played a critical support role after arriving at Opryland within days of the flooding. He was instrumental in working with local service sales specialist Todd Newton to communicate solution costs to Opryland facilities personnel.

EATON
Powering Business Worldwide

"EESS immediately began expediting equipment and parts that would allow us to meet the July 1 deadline set by the customer to have the powerhouse online," Short said. "The scope included rebuilding 27 kV and 5 kV breakers that were shipped to the ACE (Aftermarket Center of Excellence) location in Baton Rouge (LA) where Class 1 reconditioning was performed.

"ACE personnel worked tirelessly to expedite parts needed for the Class 1 services. "In addition, Eaton manufactured 5 kV motor starter contactors, 480V panelboards and busway, demolished and replaced existing MCCs, and replaced various meters, relays, current and potential transformers, and cell control wiring, as well as other components."

James Olson, EESS specialist engineer from the Birmingham office, coordinated an extensive upgrade of the protective relaying, metering and control scheme tied to the powerhouse switchgear. The work involved designing a new Power Xpert® architecture that included two gateways and an integrated Power Xpert system with remote control/communication capabilities.

Olson's group wrote custom logic to replace the functionality of multiple existing mechanical relays, and performed a complete redesign for turbine generator protection.

"The engineering team substantially enhanced the safety of the powerhouse despite the severe deadline," Short noted.

Wrapped into the deadline was a neighboring outdoor substation that fed the powerhouse building before being submerged. "ACE reconditioned the affected 5 kV breakers and our field technicians refurbished equipment in the walk-in switchgear room," Short said.

After mapping out a well coordinated powerhouse solution and putting it into effect, EESS turned its attention to the remainder of the Opryland complex. Four senior engineers conducted a detailed remediation tour of the areas.

Said Short, "They worked through one night using NEMA® guidelines for addressing flood-damaged equipment. Their documentation covered every piece of electrical equipment down to 20 amp and 30 amp breakers—to determine whether it could be refurbished or had to be replaced."

Crisis Response Trailers

One of Eaton's 32-foot Crisis Response trailers was dispatched to the stricken site. "These trailers are designed specifically to meet basic first-response needs," explained Jack Rioux, an EESS project manager responsible for the mobile units and for moving them to emergency locations.

"They are equipped with everything from cleaning supplies to construction tools. We provide enough equipment and materials to make an area safe and evaluate the situation."

After its initial use at Opryland, the mobile unit served as a command center for performing extensive retrofit services on the electrical equipment that could be salvaged throughout the complex.

Results

Making full use of its widespread service capabilities, EESS played a major role in making the Opryland powerhouse fully operational by the July 1 deadline. Its support in restoring the remaining areas kept the owner on track to re-open the famed complex before the end of 2010.

Short, summarizing the EESS performance, said, "It reflected the extensive Eaton service capabilities and superb teamwork in responding to an emergency, regardless of scope."

The flooding found its way indoors

Once thriving, now deserted

The atrium underwater

Eaton Corporation
Electrical Sector
1111 Superior Ave.
Cleveland, OH 44114
United States
877-ETN-CARE (877-386-2273)
Eaton.com

Printed in USA
Publication No. CS02700001E / Z10204
September 2010

Powering Business Worldwide

PowerChain Management®