



INDUSTRIAL TRANSFORMATION

**INDUSTRIAL IoT SOLUTION HELPS NUCLEAR POWER PLANT
KEEP ITS SIREN SYSTEM ALERT**





THE ACE3600 RTU POWERS EXTENSIVE ALERT SYSTEM COVERING 3 COUNTIES ACROSS TWO STATES

OVERVIEW

On March 28, 1979, the United States experienced the worst nuclear accident in its history at Three Mile Island, Pennsylvania. In the wake of the accident, a presidential commission found the need to greatly improved evacuation procedures. Today, federal law mandates that nuclear power plants within the United States must have an Alert Notification Systems (ANS) to warn citizens within a 10-mile radius in case of an accident resulting in the release of radiation exposure to the public. The ANS system that surrounds the 10-mile Emergency Planning Zone (EPZ) are tested regularly to ensure it's working properly and that plant employees remain up-to-speed on emergency warning protocols and systems.

This use case examines a midwestern public power provider which has a particularly complex nuclear power plant ANS. The ANS covers a large geographic area spanning across two states and includes 101 active sirens and two system control servers located at two different facilities. The ANS has three activation points in three different counties with the EPZ allowing them to sound sirens for their own citizens.

CUSTOMER PROFILE

Company:

Midwestern Public Power Provider

Industry:

Nuclear Energy

Product:

ACE3600 Remote Terminal Unit

KEY BENEFITS:

- Optimal performance of extensive siren network that exceeds all regulatory requirements
- Reliable communications that rival simplex and single site/ single channel radio systems
- Remote monitoring using a variety of configurable analog and digital ports
- Inter-local integration with surrounding counties
- High level of redundancy with simultaneous support for multiple communications technologies
- Advanced security features, including use of the enhanced-encrypted MDLC protocol, FIPS-140-2 approved AES 256 encryption, and password protected key files



THE CHALLENGE

In order to meet the new and evolving regulatory requirements the nuclear power plant needed to upgrade from outdated Remote Terminal Units (RTU) installed in the 1980s to modern, digital RTUs. The updated system needed to be cost-effective, support the plant's extensive siren alert network, and utilize its already-established trunked radio communications network.

The right solution partner would need to meet four specific challenges:

1. Provide an interoperable solution that can integrate into surrounding counties siren systems
2. Provide a highly redundant and reliable solution able to support multiple communications technologies simultaneously
3. Provide system flexibility to remain compliant with changing Nuclear Regulator Commission (NRC) Mandates
4. Provide the plant's personnel with the ability to remotely monitor and access sensor data while using a variety of digital and analog inputs rather than relying on resource intensive and time consuming procedure of having to conduct in person site visits.

Motorola Solutions was brought in to provide guidance on the path forward. They, in turn, reached out to one of their premier siren application experts, a Motorola Solutions Authorized SCADA Reseller (VAR), to team up on an appropriate solution to meet the power provider's needs.

THE SOLUTION

The nuclear power plant determined that the most effective way to ensure reliable communications within its siren alerting system was to use the ACE3600 RTU by Motorola Solutions. The ACE3600 RTU provides an operations-critical automated remote terminal unit and is part of Motorola Solutions Industrial Internet of Things portfolio. The ACE3600 RTU connects across a variety of communications media and data processing controls. It features an easily upgradable, modular design, and enhanced encryption and security features that meet the needs of nuclear power plant security requirements. The ACE3600 RTU is specifically designed for mission-critical facilities, such as nuclear power plants, that need to control and monitor exceedingly complex supervisory control and data acquisition (SCADA) environments. Plus, it is the only RTU that has received cyber security certification by the Department of Homeland Security.

The power plant uses two ACE3600 RTUs located within the ECC and EOF to issue sequential activation messages to each of its controlled sirens. Once the initial activation requires is issued, the ACE3600 initiates communication over the ASTRO 25 radio system to verify communications paths between sites, then begins sequences to each siren. After the operations is completed, the ACE3600 retrieves operational status updates from each siren site, confirming that alerts were successful and if not, identified any issues.



THE BENEFITS

The ACE3600 has proven extremely beneficial to nuclear power plants and other critical infrastructure sectors around the world. The ACE3600 can accommodate two-way radio systems as it offers reliability beyond other solutions that use simplex or single site/single channel radio systems. The ACE3600 can be deployed from the ground-up over virtually any type of radio network and can work with anything from conventional analog systems, to UHF and VHF bands, or over public or private 3G/4G networks and Ethernet.

The power provider's long and trusted relationship with the VAR, Integrated Telecommunication Systems (ITS), and previous use of Motorola Solutions meant that there was no need to incur additional infrastructure costs. The system was already integrated with surrounding counties, which made the ACE3600 RTU system a very cost-effective option.

Since the ACE3600 was backward compatible with the existing MOSCAD hardware and radios the migration to the new hardware was simple and straightforward. In addition, the flexibility and adaptability of Motorola Solutions' ACE3600 RTU has allowed the power plant to meet and even exceed NRC requirements. Due to the historical trend and reporting capabilities the power plant can have a record of history and can continue to make improvements as time goes on.

Finally, the power plant benefited from the ACE 3600's variety of analog and digital ports to setup remote monitoring and troubleshooting - saving time, adding efficiency and catching common issues before they became larger more expensive problems.

For more information on how to transform your operations with the Industrial Internet of Things from Motorola Solutions please visit https://www.motorolasolutions.com/en_xl.html



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