

Enhancing Nuclear Power Plant Safety: The Rosemount 3150 Series Transmitter.

Type: Workshop

Tech level: Intro

Session Abstract:

As the Fukushima Daiichi disaster in Japan underscored, nuclear power plants must have accurate and reliable operation for all safety related systems, including the process instrumentation. Due to their critical nature, these safety systems are regulated and their components must be qualified to operate during abnormal events, such as an earthquake or a loss of coolant accident (LOCA). In such environments, the process instrumentation may be exposed to seismic level mechanical loadings, gamma radiation and high pressure/temperature steam. These conditions are significantly more severe than those seen in conventional process application.

With these industry realities in mind and in light of new cutting-edge reactor designs, the Rosemount 3150 Series nuclear qualified pressure transmitter delivers highly reliable and accurate measurement before, during and after exposure to the harshest conditions faced by nuclear customers.

This presentation will broadly highlight the unmatched performance of the Rosemount's 3150 Series nuclear pressure transmitter offering. It will also detail the qualification process for the Rosemount Model 3154 Transmitter, which was designed for harsh environment installations inside the reactor containment building of a nuclear power plant.

The Challenge:

The customer must have full confidence that Emerson's products, in an aged condition, will perform the intended safety function before, during and after being subjected to any potential accident condition in the plant.

Solution

In order to provide the industry with a transmitter that will perform in the harsh environmental conditions of a nuclear power plant, Rosemount Nuclear incorporated fully analog electronics, a robust electronics housing and Rosemount's patented, capacitance sensing technology into the design of the 3150 Series. These design elements play a large role in the transmitter's ability to perform under extreme environmental stressors, such as vibration, radiation, high pressure/temperature steam or full submersion in boric acid at elevated temperatures.

The Rosemount 3154 Pressure Transmitter is the ultimate measurement solution for critical safety systems inside the irradiated containment structure. Some examples of typical applications include:

- Reactor Pressure and Level
- Reactor coolant pump DP
- Steam Generator Pressure and level

- Main loop Pressurizer pressure and level
- Containment pressure

Results

In order for Rosemount Nuclear to provide its customers with a solution for critical safety systems, the product must first be subjected to a formal qualification test program. These programs are controlled by industry standards, such as IEEE, KTA and RCC-E, and vary by world area. This process, often carried out by an independent 3rd party, subjects the transmitter to a series of sequential environmental stressors that are designed to simulate potential accident conditions within a nuclear power plant. By successfully completing a qualification test program, Rosemount Nuclear is able to provide its customers with confidence that the product will be reliable and perform accurately in their critical safety system.

Partially launched 2010, with over 2000 shipments to date and bookings for many more, the Rosemount 3150 Series is quickly becoming the industry standard. Development of the Rosemount 3150 nuclear qualified pressure transmitter clearly illustrates Emerson's Ability to take on the world's toughest industrial challenges.