

Latest News

On April 13, 2017, NRC staff briefed the Reactor Oversight Process Working Group on NRC concerns regarding an apparent breakdown in the industry’s actions to follow-up on Information Notice 97-45, “Environmental Qualification Deficiency for Cables and Containment Penetration Pigtails.”

Recent Industry Experience

- St. Lucie – 2016010-01, “Failure to comply with TS requirements for CHRRMs.” Green finding during Design Bases Inspection (Programs) in 2016.
- Robinson – 2016008-03, “Failure to comply with TS requirements for containment high range radiation monitors.” Green finding during CDBI in 2016.
- Brunswick – LER 2016-005-000, Declared HRRMs inoperable, replacing cables due to type.

Issue Background

In 1997 and 1998, NRC Information Notice (IN) 97-45 and its Supplement 1 notified licensees that during certain Design Basis Accidents (DBAs), the Containment High Range Radiation Monitors (CHRRMs) are subject to erratic behavior and possible failure from the damage to the cabling



system due to high environmental temperatures and steam. The high temperatures and steam could cause **Thermally Induced Currents (TIC)**, turbulences, vibrations, and

moisture intrusion. The NRC distributed IN 97-45 in response to issues discovered at San Onofre Nuclear Generating Station (SONGS). To determine the severity of this condition, Southern California Edison and EPRI performed testing on unaged cables of similar compositions and documented effects of moisture intrusion and TIC. The testing on unaged cables resulted in blistering of cable jackets, water intrusion, erratic signals, and in some cases complete failure.

TICs are a function of temperature change, while other issues such as coaxial cable Insulation Resistance (IR) are a function of absolute temperature. Due to the complexity of the issues, a detailed analysis is the most complete way to ensure all aspects are considered.

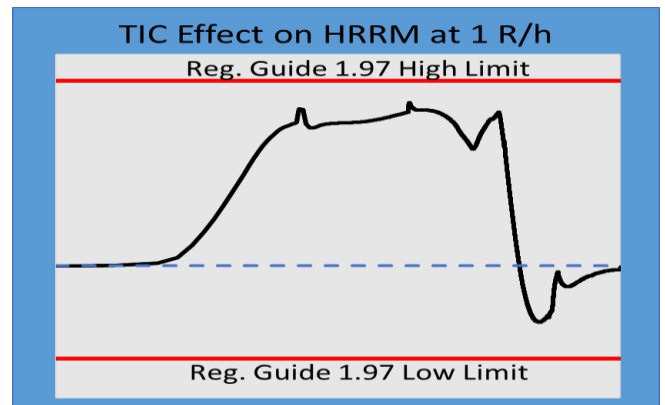
What are other plants doing?

- Reviewing existing responses to IN 97-45 and Supplement 1.
- Ensuring all aspects of the IN have been fully addressed.
- Re-analyzing HRRM cables for TIC for all applicable areas and scenarios.
- More accurately determining environmental conditions/cable temperatures.
- Updating Operator training and procedures.
- Replacing cables, when necessary.

How can Zachry Nuclear Engineering help?

Zachry is the developer of the GOTHIC* software and the recognized expert for performing GOTHIC analyses. Zachry has analyzed Containment, Auxiliary/Reactor Building and other compartment transient temperature response, as well as specific wire/cable/insulation temperatures and temperature gradients. Our expertise can help with refinement of environmental conditions/cable temperature results, as needed to gain margin.

Zachry has helped multiple plants re-analyze their HRRM cables for TIC to define when HRRMs are providing accurate indication, consistent with RG 1.97 guidelines.



To have a conversation on how Zachry can help at your plant, please call:

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