

DUKE POWER COMPANY

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VICE PRESIDENT
NUCLEAR PRODUCTION

October 14, 1983

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Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street NW, Suite 2900
Atlanta, Georgia 30303

Subject: McGuire Nuclear Station Units 1 and 2
Docket Nos. 50-369 and 50-370
LER/PO-369/83-85 and 370/83-50

Dear Mr. O'Reilly:

Please find attached Reportable Occurrence Reports RO-369/83-85 (Unit 1) and 370/83-50 (Unit 2). These reports concern T.S. 6.9.1.10(i), "...Discovery During Unit Life of Conditions Not Specifically Considered in the Safety Analysis Report or Technical Specifications that Require Remedial Action or Corrective Measures to Prevent the Existence or Development of an Unsafe Condition." This incident was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

H.B. Tucker

Hal B. Tucker

PBN:jfw
Attachment

cc: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. W. T. Orders
NRC Resident Inspector
McGuire Nuclear Station

Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

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DUKE POWER COMPANY
McGUIRE NUCLEAR STATION
REPORTABLE OCCURRENCE REPORT NOS. 369/83-85 and 370/83-50

REPORT DATE: October 10, 1983

FACILITY: McGuire Units 1 & 2, Cornelius, NC

IDENTIFICATION: Potential Deficiency of Seal at Conduit Connection to
Safety-Related Equipment Located in Harsh Environments

DESCRIPTION: Steam generator blowdown recycle system valve 1BB-143 and associated limit switches had been subjected to direct primary coolant system spray from a body-bonnet leak from reactor coolant valve 1NC18 for a period of at least three weeks (Ref. RO-369/83-60). Subsequently, a limit switch failure was discovered during trouble-shooting of a blown fuse in the control circuit of valve 1BB-143 which was attributed to moisture intrusion into the limit switch at the junction between the conduit connector and limit switch housing. This event led to an investigation to determine the cause of moisture intrusion into the limit switch.

As part of this investigation, several components, including limit switches, with the as-installed conduit connections were tested the week of September 25, 1983 at postulated accident temperatures and pressures. Results of this preliminary testing indicated that the equipment/cable interface using a Crouse-Hinds conduit coupling as a sealing method is susceptible to moisture seepage. In light of the potential inadequate seal at the equipment interface for devices utilizing the Crouse-Hinds coupling option of the McGuire installation specification, the NRC was notified on September 30, 1983.

EVALUATION: Safety-related equipment located in containment or doghouses and required to function under the postulated accident conditions was reviewed to determine sealing requirements and the cable entrance seal installation method used. Results of this review are as follows:

- 1) Valcor solenoid valves, ASCO solenoid valves, Barton transmitters, Rosemount RTD's, TEC acoustic monitors, General Atomic radiation monitors, and D. G. O'Brien penetrations are properly sealed.

Note: For the Valcor and ASCO solenoid valves, the installation specification allowed an option to seal with the suspect method. However, actual practice at McGuire was to use a proven potting option for sealing. Verification that the potting was used for sealing will be made for safety-related Valcor and ASCO solenoids requiring sealing.

- 2) Electric hydrogen recombiners, Rotork and Limitorque motor-operated valve actuators, Joy and Reliance motors, and Borg Warner solenoid valves require no cable entrance sealing.
- 3) Namco limit switches, Aeromatic Allied solenoid valves, Solon differential pressure switches, Rosemount transmitters, Target Rock solenoid valves, and Magnatrol level switches were installed per an option of the installation specification which may be susceptible to moisture seepage.

The only equipment of concern is the equipment identified in Category 3 above. This equipment may be susceptible to moisture seepage at the conduit fitting.

Namco limit switches (approximately 130 per unit) are used principally in air-operated valve control and indication circuits, primarily in indication applications. Aeromatic Allied solenoid valves (24 per unit) are used only on the main steam isolation valves. Solon differential pressure switches (4 per unit) are used to sense differential pressure across the containment air return damper blades and prohibit damper opening until the differential pressure is low enough to preclude damper motor overloading. Rosemount flow transmitters (4 per unit) were added for auxiliary feedwater flow monitoring in response to TMI concerns. Target Rock solenoid valves (4 per unit) were added as part of the Reactor Vessel Head Vent System in response to TMI concerns. Magnatrol level switches (12 per unit) terminate feedwater flow in main feedline breaks in the doghouse.

CORRECTIVE ACTION: Duke plans to apply Dow Corning RTV 3145 sealant to the conduit fittings of equipment identified in Category 3 above to ensure that moisture will not penetrate the equipment/cable interface. Dow Corning RTV 3145 1) provided a leak-tight seal during preliminary evaluation testing, 2) is supported by vendor data that indicates it has a high probability for successfully passing a formal environmental qualification program inclusive of thermal and radiation aging, and 3) is relatively easy to apply compared with other sealants tested. A full qualification program will be initiated to confirm the acceptability of this sealing technique.

Schedule for installation of the RTV 3145 sealant is as follows:

Unit 1 - Shutdown weekend of October 29, 1983

Unit 2 - Shutdown weekend following return to service of Unit 1.

This schedule provides sufficient time to prepare and distribute necessary revisions to the installation specification, assemble materials and equipment and assemble and train installation personnel. Also, it is anticipated that the same work will be performed on Oconee Unit 2 prior to shutdown of Unit 1, thus allowing some experience to be gained in the installation method.

SAFETY ANALYSIS: Continued operation of McGuire is justified for a limited period of time based on the low probability of the occurrence of a design basis event and on an engineering assessment that equipment installed using the installation specification option susceptible to moisture seepage can perform intended functions during postulated accident conditions as follows:

- 1) Namco limit switch operational experience (i.e. installed switch exposed to direct reactor coolant spray for a minimum of three weeks prior to failure) and preliminary test data indicates that the Namco limit switches would remain operable when exposed to postulated accident conditions.
- 2) Aeromatic Allied solenoid valves are mounted in an enclosure (termination box) which protects the solenoids from direct spray. The cable enters the enclosure from the bottom and connects to the solenoid valve via a termination block located in the upper portion of the enclosure. The protective enclosure and bottom entry of the cable provides substantial assurance that the solenoids would remain operational.

- 3) Solon differential pressure switches are required only for a short time under accident conditions (approximately 1 minute) and are completely isolated from the associated damper control circuit via limit switches after the damper opens.
- 4) Rosemount flow transmitters are used for monitoring only. Steam Generator level transmitters located in containment provide a diverse indication of auxiliary feedwater flow to all steam generators.
- 5) The qualification program for the Target Rock solenoid valves verified solenoid operability with moisture seepage at the equipment/cable interface.
- 6) The qualification program for the Magnatrol level switches verified switch operability with conduit fittings similar to those susceptible to moisture seepage.

The above evaluation provides adequate assurance that both McGuire units can be operated safely until the revised sealing method is implemented on each of the affected devices. This deficiency does not have an adverse health and safety implication to members of the public.