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U.S. Nuclear Regulatory Commission
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Subject: Oconee Nuclear Station
Docket Nos. 50-270
Special Report per Technical Specification 5.6.6
Problem Investigation Process No.: O-03-0154
O-03-0415

Gentlemen:

Pursuant to Oconee Nuclear Station Technical Specification 5.6.6, attached is a special report regarding the inoperability of the Unit 2, Train "A", Wide Range Reactor Containment Building (RB) Water Level instrument. This train performs a Type B post-accident monitoring function per Duke Power Company's response to Regulatory Guide 1.97.

The source instrument is located inside the Reactor Building and is inaccessible during normal operations due to radiation. Repairs will be conducted during the next reasonable opportunity, no later than the next Unit 2 scheduled outage, projected for spring 2004. Redundant components in Train "B" remain operable. Redundancy/diversity is also provided by the Borated Water Storage Tank Level and RB Narrow Range Sump Level indicators. This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,



R. A. Jones

Attachment

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INPO (via E-mail)

Oconee Nuclear Station
Special Report per TS 5:6.6
Inoperability of the Unit 2, Train "A",
Wide Range Reactor Building Water Level instrument
February 25, 2003

Abstract:

At 22:30 on 1-12-03, during PT/2/A/0600/001, "Periodic Instrument Surveillance," Operations noted that the differential between Wide Range Reactor Building (RB) Water Level Train "A" and "B" was approximately 0.54 feet, which exceeded the acceptance criteria of 0.5 feet. Operations confirmed that Train "B" (approx. 0) was accurate, and Train "A" (>0.5 feet) was suspect, based on a check of other water level indications in Containment.

The RB Water Level Train "A" instrument string was declared inoperable and a Technical Specification (TS) condition statement was entered on 1-12-03 at 22:30. A work request was initiated to investigate and repair the Train "A" indications. Troubleshooting has been limited by the intermittent nature of the reading and the inaccessibility of the source instrument inside containment. Although the Train "A" instruments remain functional with the observed errors small (~6 inches), the instruments are not considered reliable. After 30 days, a TS provision requires this special report. Plans include continued monitoring until the next reasonable opportunity to effect repairs. The redundant train ("B") remains Operable. Redundancy/diversity is also provided by the Borated Water Storage Tank Level and RB Narrow Range Sump Level indicators. This event is considered to be of no significance with respect to the health and safety of the public.

Background:

Reactor Building (RB) (or Containment) Water Level (Wide Range) is a Regulatory Guide (RG) 1.97 Type B, Category 1 variable provided for the Post Accident Monitoring (PAM) function of verification and long term surveillance of Reactor Coolant System (RCS) integrity.

Level transmitter 2PAMLT0090 (2LT-90) includes two overlapping transducers located inside of the shield wall in the RB basement. Therefore the transducers are not accessible with the reactor critical. The resistance of the transducer is measured

by remote electronics located in the cable room under the Control Room. The electronics package includes a signal converter to produce outputs to Control Room indications, which include a chart recorder, a receiver gauge, and an analog point on the operator aid computer (OAC). A redundant level transmitter, 2LT-91, provides Train "B" indication to separate Control Room indications, which include a receiver gauge and the OAC. These indications have a range of 0-15 Ft of water.

Technical Specifications (TS) require two trains of RB Containment Sump Water Level (Wide Range). If one train is inoperable, TS allow 30 days for restoration or a report must be submitted within the following 14 days. The report must outline the preplanned alternate method of monitoring (PAM only), the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to operable status.

Prior to this event Unit 2 was operating in Mode 1 at 100% power with no safety systems or components out of service that would have contributed to this event.

Event Description:

PT/2/A/0600/001 "Periodic Instrument Surveillance" for RB Post Accident Water Level Wide Range Indication says to "Verify Train "A" AND Train "B" Meters, Computer, and Recorder (2BS CR0085) agree within 0.5 ft."

At approximately 0000 hours on 1/8/2003, Unit 2, Train "A", RB Water Level Instrument, 2LT-90, began to indicate a level of approximately 0.5 feet. All three Train "A" indications (Control Room gauge, chart recorder and computer point) reflected this change. At approximately 0000 hours on 1/9/2003 the readings demonstrated a step change back to approximately 0.0 feet.

During this time, no other level indication (e.g. Unit 2 RB Normal Sump, Emergency Sump Level, or the Train "B" RB Water Level) supported the reading.

At approximately 23:00 hours on 1/11/2003, the Train "A" indications again experienced a step change to approximately 0.5 feet. Again, none of the other water level instruments

supported the reading. Train "A" continued to read approximately 0.5 feet throughout 1/12/2003.

At 22:30 on 1-12-03, during an instrument observation per PT/2/A/0600/001, it was noted that the differential between Train "A" and "B" was approximately 0.54 feet, which exceeded the acceptance criteria of 0.5 feet. Investigation by Operations confirmed that, based on a Channel Check of other indications of water in Containment, Train "B" (approx. 0) was accurate, and Train "A" (>0.5) was suspect.

The Train "A" string of instruments was declared inoperable and TS 3.3.8 Condition A was entered for RB Water Level Train "A" on 1-12-03 at 22:30. A work request was initiated to investigate and repair the Train "A" instrument string.

For several days after that time, the Train "A" RB Water Level behaved erratically, showing occasional step changes to approximately 0.5 feet followed by a return to readings near 0.1 feet. The most recent erratic behavior occurred on 1/25/2003. The readings then returned to approximately 0.1 feet and have remained stable.

A troubleshooting plan has been put in place as described below but has been limited by the intermittent nature of the step changes. Diagnostic monitoring to date has not been able to isolate the behavior to a specific component.

The Train "A" instruments remain functional, and the observed errors to date tend to be small (~6 inches), yet the indications are not considered reliable. This parameter is not used to initiate any specific operator actions for LOCA mitigation. There is one redundant train (Train "B") of instruments available to monitor this RG 1.97 Type B Category 1 parameter.

The Oconee Updated Final Safety Analysis Report (UFSAR) states that additional redundancy/diversity for this parameter is provided by the Borated Water Storage Tank (BWST) Level and RB Narrow Range Sump Level indicators.

Although not a direct measurement of RB water inventory, the BWST Level instrumentation is the RG 1.97 Type A Category 1 variable provided to guide the operator to initiate the switchover of the Low Pressure Injection emergency core cooling pump suction from the BWST to sump recirculation following a Design Basis Accident such as a LOCA. The Emergency Operating

Procedure (EOP) directs the swap from the BWST to the RB Emergency Sump based upon BWST level < 9 ft and RB level rising (not on the basis of the numeric value of RB water level reading). The EOP contains a note which gives an expected minimum RB Water Level corresponding to BWST level of 9 ft. RB Water Level indications lower than the expected minimum might be indicative of an outside-containment LOCA. Auxiliary Building water and radiation levels could also be used to diagnose an outside-containment LOCA.

The Normal and Emergency Sump Water Level Narrow Range instruments provide Type B Category 2 indication of water in the RB. Per the Oconee UFSAR, the level indications for the normal sump are the primary means for detecting water leakage within the RB. The relative locations/ranges of the RB Normal and Emergency sump instruments are such that they would be off-scale high before the Wide Range RB Water Level instruments would begin to show level.

The cause of the problem is unknown at this time, due to the intermittent mode of the erratic indication, and the inaccessibility of the transducers and associated cabling inside containment.

The Train "A" signals are being monitored as part of a troubleshooting plan. The monitoring devices are configured to provide data, if the erratic indication recurs, to determine if the error is being introduced in the transducers, associated cabling within containment, or within the signal processor. Inspections of accessible cable terminations have been conducted to minimize the possibility of loose connections.

The availability of spare parts has been confirmed.

The Work Order for this repair has been placed on the "hot list" to be worked during any unscheduled outage which will allow access to the areas inside the RB. The troubleshooting plan calls for additional troubleshooting and inspections inside the Unit 2 Reactor Building during the next shutdown which allows access into that area of the building. Repairs will be conducted during the next reasonable opportunity, no later than the next Unit 2 scheduled outage, projected for spring 2004.