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U. S. Nuclear Regulatory Commission
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SUBJECT: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Clarification on ANO-2 RCS Level Measurement for
Generic Letter 88-17; Loss of Decay Heat Removal

Gentlemen:

Generic Letter 88-17 (0CNA108823) concerning loss of decay heat removal (DHR) requested that licensees respond to recommendations for both expeditious actions and program enhancements to address specific DHR concerns. Entergy Operations at Arkansas Nuclear One (ANO) provided responses to the generic letter on January 5, 1989 (0CAN018901), for the required 60 day response and March 14, 1989 (0CAN038908), for the required 90 day response. As part of our March 14, 1989 response, we stated that additional RCS level indication would be added during the 2R8 refueling outage. This commitment was made to comply with the need to have two independent RCS level indications as requested by Generic Letter 88-17. The additional RCS shutdown level channel was installed during the recent 2R8 refueling outage.

An NRC Region IV inspection was conducted from April 8 through 12, 1991 (Inspection Report 50-368/91-13), for Generic Letter 88-17 implementation on ANO-2. During the inspection, it was noted that our response to Generic Letter 88-17 had not fully described the extent of channel independence for RCS level indication, since a common hot leg tap was being used for the three shutdown level measurement system channels (including the Tygon tubing channel). The guidance provided in Generic Letter 88-17 recognizes that total independence may not be readily achievable (i.e., sharing of a common instrument tap). However, in these cases additional compensating actions are recommended.

Since the ANO-2 design approach did utilize a common instrument tap for RCS shutdown level indication, we believe that additional clarification of our means of compliance to Generic Letter 88-17 is appropriate. Therefore, the following details for ANO-2 RCS shutdown level measurement system design and additional compensating actions are being provided.

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ANO-2 RCS Level Measurement Design

Prior to the 2R6 refueling outage, ANO-2 utilized a temporary Tygon tubing RCS shutdown level monitoring system (as discussed in the ANO-2 response to Generic Letter 87-12 dated September 18, 1987), which provides local indication only. During refueling outage 2R6, ANO-2 installed an RCS shutdown level channel which consisted of a wide range transmitter (2LT-4791) with control room indication. The transmitter was connected to the existing taps which were being used for the Tygon tubing. The upper level sensing nozzle comes off a line at the top of the pressurizer and the lower level sensing nozzle comes off the bottom of "A" hot leg drain line. See attached RCS Level Indication Diagram.

During the 2R8 refueling outage, a new instrument channel was added to provide additional control room indication for Generic Letter 88-17. The modifications to the RCS shutdown level monitoring system included:

(1) Adding a RCS level indication channel with a new level transmitter (2LT-4792) and a new level indicator with a variable alarm setpoint adjustment.

(2) Replacing the existing level indicator with a new indicator having variable alarm setpoint adjustment.

(3) Adding a common RCS level Hi/Lo alarm.

(4) Converting the existing transmitter (2LT-4791) to a dry reference leg (the new transmitter was installed with a dry reference leg).

The two remote indicating instrument channels are shown on the attached diagram. The channels are electrically independent with the new instrument channel being supplied by a Class 1E power bus. However, even though the instrument channels utilize separate pressurizer reference leg taps, the two variable legs share a common lower tap off of the RCS "A" hot leg. A separate variable leg tap was not available without adding a new RCS penetration. The use of the common lower tap (given certain shutdown compensating actions to ensure the availability of both RCS level channels) was believed to be more desirable than installing new RCS penetrations.

The common RCS level Hi/Lo alarm was also added during 2R8 which provides alarm indication for both RCS level indicators. The indicators have variable setpoint adjustments which can be controlled manually from the control room. This provides the control room operator with the ability to vary the alarm setpoints at different water levels.

Based on the guidelines provided in Generic Letter 88-17, Entergy Operations believes the programmatic enhancements of the generic letter for RCS level indication have been met, as was installed in 2R8.

ANO-2 Compensating Measures for Common Hot Leg Tap

To address the common variable (hot leg) instrument tap for the RCS shutdown level measurement system, a specific step was added to the ANO-2 procedures (currently in Procedure 1015.03B, "Unit 2 Operations Logs"). This step ensures that any potential instrument line blockage will be identified by periodically verifying flow through the instrument line by draining the variable legs.

Other measures taken to ensure the reliability of the RCS shutdown level measurement system include performing regular walkdowns of the Tygon tubing for kinks and periodically draining the instrument line reference legs for condensation removal. The January 5, 1989, letter containing the Generic Letter 88-17 60 day response also contains additional measures being taken on ANO-2 to improve RCS level monitoring.

Entergy Operations believes that these compensating measures along with the other RCS reduced inventory actions are sufficient to prevent potential RCS shutdown level measurement concerns.

If you require any additional information, please contact our office.

Very truly yours,

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RCS LEVEL INDICATION