Entergy Operations

Entergy Operations, Inc.
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Subject: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Additional Information Concerning Instrument Error Calculations
for Containment Building and Pressurizer Pressure Transmitters
TAC Nos. M84039 and M84095

Gentlemen:

In a letter dated July 9, 1992 (2CAN079207), Entergy Operations submitted for your review and approval a proposed Technical Specification (TS) change revising Table 2.2-1 Reactor Protective Instrumentation Trip Setpoint Limits and TS Table 3.3-4 Engineered Safety Feature Actuation System Instrumentation Trip Values. The proposed change revised the setpoints and allowable values for those actuations which receive input from the Arkansas Nuclear One - Unit 2 (ANO-2) containment building narrow range pressure transmitters due to replacement of these transmitters during the current ANO-2 refueling outage.

During a telephone conversation on August 12, 1992 the NRC staff requested additional information/clarification to support the review of the requested changes. In a subsequent telephone conversation on August 19, 1992, ANO provided responses to the NRC request. During this subsequent conversation, it was determined that this same information should be provided for a proposed TS change increasing the allowable pressurizer pressure range and lowering the low pressurizer pressure setpoint for reactor trip, safety injection, and containment cooling (letter 2CAN079202 dated July 22, 1992) also under review by the NRC Staff. The purpose of this letter is to document the responses provided verbally.

The questions asked during the August 12, 1992 conversation and our responses given during the August 19, 1992 conversation are stated in Attachment 1. A copy of the instrument error calculations for the narrow range containment pressure transmitters is included as Attachment 2. A copy of the instrument error calculations for the pressurizer pressure transmitters is included as Attachment 3.

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If you have further questions please contact Glenn Ashley at (501)964-8617, or Clint Szabo at (501)964-8622.

Very truly yours,

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JJF/CWS/sff
Attachments

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Attachment 1

Additional Information Concerning Instrument Error Calculations

Item 1 The calculation states that maintenance and test equipment (M&TE) accuracy is assumed to be twice the instrument accuracy, how is this assumption tracked for implementation in the plant? Do the maintenance procedures specify specific M&TE that satisfies this assumption?

The calibration procedures specify the manufacturer and model number of the M&TE to be used. Also, procedure 1025.003 "Conduct of Maintenance" provides the requirements and guidelines for the performance of work by Maintenance Department personnel. Attachment 1 to 1025.003 contains a checklist of items to be considered when performing calibrations or writing procedures for calibration. Contained within this checklist is guidance concerning M&TE accuracy including the statement that "Test equipment specified for use should have an accuracy at least two times that of the process equipment being calibrated." The M&TE calibration is controlled by procedure 1000.014 "Control of M&TE and Standards." This response applies to the narrow range containment pressure transmitters and to the pressurizer pressure transmitters.

Item 2 The calculation makes no allowance for the effects of a seismic event on the setpoint because it is assumed that the setpoint will be checked following a seismic event and recalibrated if necessary. How is this assumption ensured in the plant?

Operations relies upon two methods to ensure that the effects of seismic events on instrument setpoints are detected and corrected. Each shift, and during and following a transient, instrumentation is compared channel-to-channel to check for discrepancies. Secondly, following a seismic event Technical Specification (TS) 3.3.3.3 requires an evaluation of features important to safety and the submittal of a special report to the NRC. This special report would be started by the initiation of a condition report which would require an operability determination be performed on those facility features important to safety.

Item 3 The calculation assumes that the signal converter drift is equal to the reference accuracy. What is the basis for this assumption since no vendor information is available which specifies the drift? Was historical data reviewed to determine the drift assumption? What interval is assumed for the drift?

The manufacturer's literature did not contain drift information and subsequent telephone calls to the manufacturer failed to obtain this information. ANO has adopted the practice of assuming the drift to be no more than the device reference accuracy in these situations. This is considered to be a conservative assumption considering that reference accuracy is already accounted for separately (with other error effects) such that reference accuracy is included in the calculation twice. It is not considered likely that the device would drift beyond its reference accuracy allowance considering the design and construction quality of the device. In situations

where drift information is unavailable from the manufacturer, historical calibration data (as found/ as left) can be reviewed to gain insight into the drift characteristics of the device, but may include the combined effects of M&TE and other environmental influences. Therefore, the apparent drift may be larger than the real drift of the component. Past calibration history has been reviewed for the narrow range containment and wide range pressurizer pressure instrumentation in an effort to verify the drift assumptions.

Several cycles of past calibration as-found/as-left data were reviewed for the narrow range containment pressure instrumentation and the wide range pressurizer pressure instrumentation. The time periods between successive calibrations varied. For the narrow range containment pressure instrumentation, at least one cycle contained data over a time period encompassing the 22.5 month drift interval assumed in the calculation. The drift values assumed for the signal converters in the calculation bound the drift values reviewed in the calibration history for the narrow range containment pressure instrumentation over the assumed 22.5 month drift interval.

Data for the wide range pressurizer pressure signal converters was unavailable for the full 22.5 month period. The review of past calibration history showed that the apparent drift of five components (2PY-4624-1A, 2PY-4624-2A, 2PY-4624-3A, 2PY-4624-4A, and 2PY-4624-2C) may have slightly exceeded the calculation's original drift error assumption. Subsequently, the calculation was revised to increase the error allowance for these components and excess conservatism was removed from the insulation resistance (IR) error calculation. The IR error was overly conservative as it was previously based solely on ANO-2 worst case bounding accident temperatures instead of more realistic (lower) accident temperatures expected at the specific required time of trip actuation. The available as-found/as-left calibration data was extrapolated linearly from the actual time period to the full 22.5 month period assumed in the calculation. The results of this evaluation showed the drift assumed in the calculation to be conservative. Therefore, the drift values assumed for the signal converters in the revised calculation bound the drift values reviewed in the calibration history for the wide range pressurizer pressure instrumentation over the assumed 22.5 month drift interval.

Attachment 2

Loop Error, Setpoint, and Time Response Analysis for Narrow Range
Containment Building Pressure ESFAS and RPS Trip Functions