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Electric Corporation

Water Reactor
Divisions

Nuclear Technology Division

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May 6, 1985

NS-NRC-85-3034

Mr. Cecil O. Thomas, Chief
Division of Licensing
U. S. Nuclear Regulatory Commission
2920 Norfolk Avenue
Washington, D. C. 20555

Dear Mr. Thomas:

RCS Rdf RTD CALIBRATION ERRORS

This letter is to inform you of the status of the Westinghouse investigations into reports by two plants of Resistance Temperature Detector (RTD) calibration anomalies in Westinghouse supplied RTDs manufactured by the RdF Company. The issue concerns the potential for RTD calibration errors to be in excess of the Reactor Coolant System RTD error allowance identified in the RTD Equipment Specification and used in the safety analysis.

The increased RTD calibration inaccuracies were discovered when the calculated resistance versus temperature curves were compared to an actual calibration point which was not used in the calculation. The Westinghouse review indicated that the calibration methods used could lead to Reactor Coolant System RTD errors in excess of that currently assumed in the FSAR. Westinghouse has initiated activities to evaluate this effect and has formally notified the utilities whose plants are affected by this issue. Based on safety evaluations performed to date, it is our judgement that the potential increases in the RTD narrow and wide range and reference junction box errors do not represent a significant adverse effect on plant safety, therefore we believe that there is sufficient justification to support continued operation.

Increased narrow range RTD errors would primarily affect DNB related transients presented in the FSAR involving the following control and protection system parameters: Overtemperature Delta-T Reactor Trip, Overpower Delta-T Reactor Trip, Low Reactor Coolant Flow Reactor Trip, RCS average temperature measurements used for control board indication and the rod control system, and the calculated value of the RCS flow measurement uncertainty. For some Westinghouse plants, the increased indicated inaccuracy of the wide range RTDs may affect the total accuracy of the Post Accident Monitoring System, the Cold Overpressure Mitigation System and the Reactor Vessel Level Instrumentation System. The increased indicated inaccuracy of the reference junction box RTDs may affect the total accuracy of the thermocouple system.

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Westinghouse has initiated activities to evaluate this effect and to identify corrective measures on a plant-by-plant basis. Westinghouse has formally notified the utilities whose plants are affected by this issue. Attachment 1 provides a list of the affected plants.

In the interim, pending resolution on a permanent basis, safety margin assessments are being performed by Westinghouse for the operating plants to evaluate the potential effects of increased narrow and wide range and reference junction box RTD errors on the existing safety analysis, the total accuracy of the affected monitoring and indication systems, and the plant technical specifications. These safety evaluations are based on what we believe to be a conservative estimate of the potential plant specific RTD calibration errors which were derived from RdF calibration data.

Based on safety evaluations performed to date, DNB would not be expected to occur for the transients presented in the FSAR when the effects of the conservatively derived narrow range RTD errors are included. Further, a more realistic although conservative analysis of the limiting DNB transient (Rod Withdrawal at Power) including the effects of increased RTD errors indicates that the DNB design basis would still be met with considerable margin. Preliminary results of plant specific safety evaluations performed to date confirm that the conservatively derived RTD errors can be accommodated on an interim basis through the reallocation of plant specific margins although some deviations from the existing technical specifications may result.

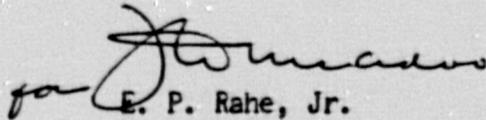
The increased sensor calibration uncertainties for the wide range and reference junction box RTDs manufactured by the RdF Company are expected to have a negligible safety impact since no changes to the total accuracy of the affected monitoring or indication systems are expected. Therefore, it is our judgement that the potential increases in the RTD narrow and wide range and reference junction box errors do not represent a significant adverse effect on plant safety.

In addition, Westinghouse is working with several operating plant utilities to assist them in quantifying the in-plant RTD calibration errors. Westinghouse has recently provided draft revised calibration data for the installed RTDs based on a composite of the RTD vendor laboratory measurements and plant startup (cross-calibration) test results along with recommendations for verification tests. Subject to utility review and verification, Westinghouse expects that the new calibrations will be accurate to within 0.5°F . This, in conjunction with parallel Westinghouse generic activities to define the necessary allowance for RTD repeatability, is expected to be sufficient to confirm that the total RTD uncertainty is within the 1.2°F allowance assumed in the safety analysis. In the interim, it is our judgement that there is sufficient justification to support continued operation.

Correspondence with respect to this issue should be directed to Ms. P. A. Loftus, of my staff at 412/374-4901.

Very truly yours,

WESTINGHOUSE ELECTRIC CORPORATION


E. P. Rahe, Jr.
Nuclear Safety Department

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Attachment

ATTACHMENT 1

RCS RTD CALIBRATION ERRORS: POTENTIALLY AFFECTED PLANTS

Operating Plants

Wolf Creek 50482
 Byron 1 50454
 Virgil C. Summer 50395
 - Indian Point 2 50247
 Indian Point 3 50286
 Callaway 50483
 Catawba 1 50413
 D. C. Cook 1 & 2 50315/50316
 Diablo Canyon 1 50275

Non-Operating Plants

Byron 2 50455
 Braidwood 1 & 2 50456/50457
 Shearon Harris 50400/50401
 Catawba 2 50414
 South Texas 1 & 2 50498/50499
 Beaver Valley 2 50412
 Alvin W. Vogtle 1 & 2 50424/50425
 Seabrook 1 & 2 50443/50444
 Comanche Peak 1 & 2 50445/50446
 Watts Bar 1 & 2 50390/50391
 Millstone 3 50423
 Diablo Canyon 2 50323