TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

USNRC REGION II
ATLANTA, GEORGIA

May 24, 1983

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

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - NRC-OIE REGION II INSPECTION REPORT 50-390/82-05, 50-391/82-03 - SUPPLEMENTAL/REVISED INFORMATION - VIOLATION 50-390/82-05-01, 50-391/82-03-01

The subject inspection report cited TVA with one Severity Level IV and one Severity Level V Violation in accordance with 10 CFR 2.201. My letter to you dated November 9, 1982 contained two enclosures. Enclosure 1 addressed TVA's programmatic improvements as requested in the subject inspection report. Enclosure 2 provided responses to two items of noncompliance. Additional information was provided on Enclosure 1 and Enclosure 2 on January 4 and February 15, 1983, respectively. Supplemental information was provided on March 18 and May 10, 1983.

As discussed in the April 25, 1983 telephone conference between NRC-OIE RII and TVA, we are providing the enclosed supplemental/revised information in response to NRC concerns over certain aspects of TVA's previous submittals on the subject violation. Specifically, additional information is being provided to supplement that information previously submitted addressing the alleged inadequate application of quality assurance (QA) requirements to heat tracing used on safety-related systems. Also, TVA has reevaluated its previous responses to the allegation of not properly identifying a nonconforming condition with radiation monitor piping classification, and now concurs with the NRC that this portion of the violation occurred as described in the subject inspection report.

If you have any questions, please get in touch with R. H. Shell at FTS 858-2688.

To the best of my knowledge, I declare the statements contained herein to be complete and true.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Licensing

Enclosure

cc: See page 2

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cc: Mr. Richard C. DeYoung, Director (Enclosure)
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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
VIOLATION 50-390/82-05-01, 50-391/82-03-01
REVISED RESPONSE TO ITEM A.1(a)(2)
SUPPLEMENTAL INFORMATION TO ITEM A.1(e)

Item A.1.(a) (2) (as identified in Appendix A of the subject inspection report)

Failure to properly identify nonconformance with design drawings and construction specifications regarding safety classification of radiation monitor piping.

Admission or Denial of the Alleged Violation

Based upon clarification recently provided by the NRC Resident Inspector, TVA admits that a nonconforming condition report (NCR) was not properly initiated to identify radiation monitor piping which did not meet the safety classifications required by TVA Construction Specification N3G-881.

Reasons for the Violation

The system engineer had discussed the sample line safety classification with the NRC Resident Inspector in January 1982. At that time the system engineer was not aware a nonconformance existed because the lines had been installed per drawing requirements. The question of proper safety classification was informally conveyed to TVA's Division of Engineering Design (EN DES), and further informal communication between the site and EN DES followed, but an NCR was not promptly initiated and forwarded to EN DES for disposition to formally resolve the question of proper safety classification.

Corrective Steps Taken and Results Achieved

NCR 3898R was initiated January 20, 1982, to identify that sample lines for seven radiation monitors had been installed as TVA class G, as specified on drawing 47W600-102 R8, while the process piping being sampled was class C. Design criteria WB-DC-40-36 states that lines attached to safety related class C or lower piping are class C. Piping QA boundaries are also delineated in Construction Specification N3G-881. NCR 3898R was dispositioned February 17, 1982, to require rework of affected lines and revision of the applicable drawings to indicate class C.

Actions to Prevent Recurrence

To ensure that nonconformances with design drawings and construction specifications are properly identified, Instrumentation Engineering Unit personnel have been trained on WBNP-QCI-1.02, "Disposition of Nonconforming Items."

Date of Full Compliance

Instrumentation Engineering Unit personnel were trained on WBNP-QCI-1.02, on January 17, 1982.

Item A.1(e) (as identified in Appendix A of the subject inspection report)

Failure to provide QA program controls over the safety-related main feedwater flow switches (Item A) and steam generator pressure transmitters (Item B) which provide signals to the reactor protection system, to ensure their protection against adverse environmental temperatures.

Admission or Denial of the Alleged Violation

TVA denies Item A and admits that Item B of the violation occurred as stated.

Main Feedwater Flow Switches - Item A

In accordance with the current QA program, TVA maintains that safety systems have been designed such that heat tracing serves no safety function. Therefore, heat tracing is not required to be within the scope of the QA program. For cases where heat tracing is used on safety-related components, methods other than heat tracing are used to assure that the components remain operational. In the case of the main feedwater flow switches which provide input into a developed reactor trip signal, TVA utilizes surveillance of the sensing lines to assure their operability (i.e., not frozen). Based on this surveillance, the safety function of the switches is assured and the heat tracing is not required to perform a safety function.

As requested by the NRC in the aforementioned April 25, 1983 telephone conference, following is a description of the controls used in the design and installation of heat tracing along with a description of the controls to be developed by TVA's operating division for implementing an inspection program.

Design and Procurement of the Heat Trace Systems

TVA's Division of Engineering Design (EN DES) defines the requirements for the design and manufacture of the heat trace system. The heat tracing for the system in question and for all other systems except one are purchased under one contract (the heat tracing for the condensate demineralizer waste evaporator, a component of the waste disposal system, was supplied with the equipment as a package). The vendor applies the same requirements for the heat trace whether it is installed on nonsafety-related systems such as raw service water system or on safety-related systems such as the safety injections system (boron injection). The contract requires the vendor to have a QA program covering the following major areas (which are the same QA requirements for supplying Class 1E equipment):

1. Organization for quality assurance

2. Procedures for design review

3. Document control

4. Procurement

5. Material receipt, identification, and control

6. Examination and inspection procedures

7. Test procedures

8. Calibration of measurement, inspection, and test equipment

9. Qualification of personnel

10. Procedures for disposition of nonconforming materials, parts, or components and for corrective action

11. Packaging, handling, storage, and shipping procedures

12. QA records

13. Audits

14. Terms and definitions

EN DES monitors the vendor to ensure that the contract requirements are being met by reviewing the vendor's design documents and by visits to the vendor's shop. EN DES reviews and approves the certified test reports from the vendor.

Installation of Heat Tracing

A. The following are the steps taken by TVA's Division of Construction (CONST) during the installation of a heat trace circuit. (Again, this procedure is the same whether the heat trace is applied to a safety-related or a nonsafety-related component.)

1. Heat trace vendor (Thermon) reviews TVA piping drawing and generates isometric drawings, which are received by the Electrical Engineering Unit (EEU) for dimensioning.

2. After piping is installed in accordance with drawings, the Mechanical Engineering Unit (MEU) or Instrumentation Engineering Unit (IEU) verbally releases pipe to EEU for dimensioning.

3. EEU contacts the Hanger Engineering Unit (HEU) to verify hangers to be used and obtains typical drawings of hangers and location of hangers.

4. EEU dimensions Thermon isometric drawings, locates hangers and valves to allow Thermon to determine amount of heat trace needed and initiates a transmittal letter (which is reviewed up to the project manager level). The original of the transmittal letter with accompanying drawings is sent directly to Thermon design engineers, with a copy of the letter and drawings forwarded to EN DES. After review by Thermon and EN DES, any problems noted are resolved.

5. Approval is forwarded from EN DES for Thermon to fabricate circuits for specific piping, valves, hangers, and temperature conditions. Thermon tests circuits and generates test reports, and ships the circuits to the Watts Bar site, where they are stored under controlled humidity and temperature conditions.

6. The test reports are transmitted to EN DES for review and approval, after which certification for installation is sent to CONST at Watts Bar. Materials Quality Control Unit inspectors release circuits for installation after receiving certification from EN DES.

7. After installation of all hangers on the segment of pipe to be heat traced is completed, HEU verbally releases hangers to EEU for installation of heat trace. EEU confers with MEU and IEU to determine if special cleaning is required prior to heat trace installation.

8. MEU, IEU, and HEU verbally release specified segments of piping for installation of the heat trace circuit manufactured uniquely for those segments. EEU then issues a material requisition authorizing warehouse release of circuits.

9. Craftsmen (in designated heat trace crews) receive circuits and begin installation, which is monitored by EEU system engineer. Upon completion of installation, EEU physically inspects installation of the circuit to ensure compliance with drawing requirements. Inspection results are maintained on file by EEU.

10. Initial testing (from a temporary power source) includes:

    Megger test

    Resistance test

    Current verification (compared to design values)

    Control verification

    Alarm and annunciation operation

11. EEU releases circuit to MEU for installation of insulation, after which EEU conducts final testing from a permanent power source which includes:

    Heatup of circuit

    Testing of controls

    Verification of recorder printout

    Check of thermocouple operation

    Testing of secondary circuit operation

    Verification that alarms function with annunciators

12. After completion of testing, EEU generates a test card showing that the functional test was performed successfully. The test card is computer-processed to update the accountability program, then stored in EEU files. After testing EEU marks "as-constructed" drawings.

B. The following design and construction controls are also exercised:

1. All work is in accordance with EN DES approved drawings.

2. Changes in circuit length are approved by Thermon, and drawings are revised accordingly.

3. Drawings are revised to reflect any changes in cabling or control circuits.

4. All process pipes have primary and secondary circuits. Each circuit is equipped with a unique thermocouple. Each set of circuits has a third thermocouple for backup temperature alarm. In addition, heater failure and undervoltage conditions are alarmed.

5. Freeze protection heat trace is provided with multiple alarms, which include low temperature, heater failure, and undervoltage.

6. Primary and secondary circuits are powered by separate sources, with controls and alarm relays also located in separate cabinets.

7. Thermon has provided site training (installation and test procedures) to TVA engineering personnel, who in turn provide craft training.

Inspection Program

As part of the overall effort to develop a programmatic approach to the operating division's efforts, a division procedure, DPM N83M2 "Freeze Protection Inspection Program," is expected to be incorporated into the new Maintenance and Engineering Program Manual. This procedure is to be issued by October 1, 1983 and will identify specific guidelines to operating plants to be used in implementing a freeze protection inspection program which will annually check and verify that all freeze protection systems are working properly and are operational. Program emphasis will be placed on safety-related equipment. This program will annually verify the adequacy of existing freeze protection and the need for additional protection in terms of effectiveness, operability, and physical condition of the associated equipment.

Steam Generator Pressure Transmitters - Item B

TVA's response to this portion of the subject violation remains unchanged from that described in our February 15, 1983 submittal.