



Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381

JAN 20 1995

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of the Application of) Docket Nos. 50-390
Tennessee Valley Authority) 50-391

WATTS BAR NUCLEAR PLANT (WBN) - UNIT 1 AND UNIT 2 - NRC INSPECTION REPORT
NO. 50-390, 391/94-69 - REPLY TO A CONCERN REGARDING ERRORS IN THE FINAL
SAFETY ANALYSIS REPORT (FSAR)

The purpose of this letter is to provide a reply to an issue discussed in the subject Inspection Report dated November 18, 1994. The issue concerned an inconsistency which was discovered between the FSAR section and system description for the Watts Bar containment spray system. The specifics related to this issue are documented as Inspector Follow-up Item (IFI) 50-390/94-69-02. In addition, several weaknesses were documented in Inspection Report 50-390, 391/94-69. This reply also addresses the IFI, the weaknesses, and the extent of condition review performed to address Notice of Violation 50-390/94-69-01.

Enclosure 1 provides TVA's response. Enclosure 2 contains a list of commitments made in this letter.

If you should have any questions, contact P. L. Pace at (615) 365-1824.

Sincerely,

Dwight E. Nunn
Vice President
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Enclosures
cc: See page 2

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Enclosures

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ENCLOSURE 1
WATTS BAR NUCLEAR PLANT UNIT 1
RESPONSE TO NRC'S NOVEMBER 18, 1994, LETTER TO TVA

DESCRIPTION OF ISSUE and IFI 390/94-69-02

The following is an excerpt from NRC's November 18, 1994 letter and describes the NRC issue:

"In addition to the violation referred to above, we are concerned about a longstanding error which our inspection discovered in the FSAR section and System Description for the Watts Bar containment spray system. The FSAR and System Description describe drains that divert water from recirculation. However, we found that the drains were intentionally plugged to prevent the water diversion in a 1978 design change. We question how this error escaped your system description and FSAR reviews and whether similar, but more technically significant, errors exist elsewhere in your design basis documents. Although our review did not identify a significant number of hardware discrepancies, this finding together with the above violation and other findings described in the enclosed report, reflect adversely on the depth and detail of your reviews. You are requested to evaluate the adequacy of your reviews in light of these findings and provide us with a written response to this matter within 60 days of the date of this letter."

The following is an excerpt from NRC's November 18, 1994 letter and describes IFI 390/94-69-02:

"The FSAR section on the containment spray system stated there were four 3-inch drains which would divert a portion of the spray water outside the crane wall following a LOCA. The System Description (a design basis document), originally prepared in 1983, similarly described these drains. Both were incorrect. The drains had been plugged in 1978, when it was determined that they would result in a post-LOCA containment sump level below that committed to for ECCS recirculation. TVA identified the FSAR drains statement for verification in the Program for Assurance of Completion and Assurance of Quality, which was completed in 1993. However, verification of this and a number of other FSAR statements was subsequently determined unnecessary because the statements were determined to be "descriptive" rather than actual commitments or requirements. TVA's failure to identify and correct the erroneous FSAR and System Description statements regarding the drains indicates a weakness in previous licensee reviews of these documents. This matter was identified for further NRC evaluation as Inspector Followup Item 50-390/94-69-02, Incomplete Resolution of Commitments Involving Descriptive Information. That evaluation will review additional examples of FSAR system design information which TVA did not verify because they were "descriptive."

DISCUSSION

As noted in Section 2.1.6 of Inspection Report 50-390/94-69, the issue docketed as IFI 390/94-69-02 is based on licensing verification commitment unit number FS060202002004. The text associated with this commitment unit was from FSAR Section 6.2.2.2. The Inspection Report also notes that this commitment unit was initially submitted to Westinghouse for verification but was returned via letter from Westinghouse to TVA noting that the commitment unit was not within Westinghouse's scope and that the verification of the unit should be performed by TVA. However, the verification of the commitment unit did not take place as an element of the licensing verification area of the DBVP. Subsequently, the review of FSAR Section 6.2.2.2 performed by the Program for Assurance of Completion and Assurance of Quality (PAC/AQ) classified the text as "descriptive" and therefore, not requiring verification.

In an effort to establish the total number of commitment units which were submitted to Westinghouse and subsequently returned for TVA verification, a review of Westinghouse letters regarding commitment unit verification was performed. Each commitment unit marked to indicate that TVA should verify implementation was reviewed to establish that verification documentation exists. The results of this review found one additional discrepancy. Commitment unit MC811215022025 is from TVA's letter to NRC dated December 15, 1981. Provided with this letter was a simplified diagram, Figure 3-1, Watts Bar Units Auxiliary Feedwater System (AFW). This diagram depicted pressure switches on either side of the flow elements on the AFW injection line to the steam generator. However, FSAR Figure 10.4-21 currently indicates that flow transmitters are installed instead of pressure switches. This is the correct plant configuration and is consistent with the design bases documents, therefore, no changes or corrections are required to resolve this discrepancy.

For the drain discrepancy documented in IFI 390/94-69-02, TVA revised System Description N3-72-4001 to reflect that the drains are plugged. An FSAR change package was also developed to revise Section 6.2.2.2 of the FSAR to show the configuration of the operating deck floor drains to be permanently plugged. These changes were accomplished as part of Design Change Notice (DCN) S-32943.

In an effort to establish the extent of condition for the IFI, a sample review was performed by PAC/AQ. This review focused on identifying additional examples of statements similar to the drain statement, that would not have been verified due to the "descriptive" classification. Of the twenty statements reviewed, PAC/AQ documented the following discrepancies in three statements as Potential Area of Concern/Recommendation (PACR) 430:

1. FSAR Section 6.2.6.2 states that a list of valves to be Type C tested is included in the Technical Specifications. Contrary to the above statement, the Technical Specifications do not contain a list of valves that are to be Type C tested.
2. FSAR Section 9.2.6.2 states that the condensate transfer pump is an electric motor driven pump rated to discharge 1000 gpm at 55 feet total head. DCN 29148-A changed the pump design performance characteristics

to 46 feet (20 psi) at 850 gpm to match the preoperational test results, which in essence derated the pump to lower performance standards. System Description N3-2-4002 was revised to reflect the derating. Currently the FSAR is inaccurate.

3. FSAR Section 8.2.2 states that the setpoint for the 6.9kV Shutdown Board overvoltage relays is "7260 Volts \pm 1 percent (110 percent of motor rated voltage with a time delay of 300 seconds)." Design Criteria WB-DC-30-28 and the schematic drawings do not indicate a time delay for these overvoltage relays.

The changes to the FSAR required to resolve these three issues have been documented in FSAR change packages. The general problem documented in these items is being addressed by the Technical Specification (TS) Certification and FSAR Consistency Review program. The TS Certification program implements a process to certify the content of the Unit 1 TSs for Watts Bar. This Certification process requires that each line item of the TSs be reviewed by the organization assigned responsibility for the specification. Specifically, the review is to establish that each specification and bases accurately reflect the design bases of Watts Bar Unit 1, and are consistent with the FSAR. As part of this effort, the FSAR will be searched to identify references to the Technical Specifications. Each reference will be reviewed for consistency between the two documents. If discrepancies are identified by this review, the responsible organization initiates the required change to certify the specification or bases and forwards that change to Site Licensing for incorporation into the certification draft. The second half of the TS Certification and FSAR Consistency Review program implements a process to certify the consistency of the FSAR. This process requires that each section of the FSAR be reviewed by the organization assigned responsibility for the section. Specifically, the review is to establish that each FSAR section accurately reflects the design bases of Watts Bar Unit 1, and the FSAR section is not inconsistent with the Safety Evaluation Report (SER). If discrepancies are identified by this review, the responsible organization must initiate the required changes to update the FSAR and forward the changes to Site Licensing for incorporation into a future amendment.

Separate from the above, an additional review will be performed to address the second item. To ensure required changes to the FSAR are being initiated based on the resolution of Test Deficiency Notices (TDNs), a review of TDNs will be performed by Nuclear Engineering. This review will establish for DCNs which were initiated based on TDNs, that required changes to the FSAR have been identified and submitted for incorporation into an amendment.

The TS Certification and FSAR Consistency Review program was initiated prior to the discrepancies being identified by NRC or PAC/AQ. However, their intent is to correct similar discrepancies. In an effort to establish that the Consistency Review process will function to correct errors of this type, several FSAR sections classified as "descriptive" were selected and submitted to the responsible organization for performance of a consistency review.

PAC/AQ has reviewed the results of the responsible organizations' consistency reviews, and discrepancies similar to the PAC/AQ findings were noted by the reviewing organizations. Considering the fact that the review results have presented similar discrepancies, it is concluded that the FSAR Consistency Review process, if conducted as indicated by the samples reviewed, can be relied upon to identify "descriptive" statement inaccuracies. Points which are particularly noteworthy about this review are:

- An FSAR consistency review had not yet been performed on the sections of the FSAR from which the discrepancies, documented as PACR-0430, were identified.
- The additional discrepancies identified by PAC/AQ and the responsible organizations are primarily administrative in nature or documentation inaccuracies which have no technical or safety significance.

Although the sample results indicate that these programs will function to correct errors of the type noted by NRC and PAC/AQ, enhancements to strengthen the programs will be made by February 3, 1995. This will be achieved by adding guidelines to focus on these types of errors. Other potential problem areas, such as the consistency of references to industry standards, will also be addressed.

In addition to the processes defined above, the output of the DBVP is continually being improved. The improvement is achieved as the products are used for the writing of preoperational tests, procedures required for plant operation, or general use in preparation for the operation of the plant. Through this usage, inconsistencies and discrepancies can be identified and corrected. This element of improvement has been previously discussed with NRC and was addressed in TVA's letter to NRC dated August 31, 1994, Supplemental Response to Notice of Violation 390/93-66-01 and 390/93-66-02. Furthermore, the System Plant Acceptance Evaluation (SPA-E) II process requires, on a system basis, a detailed review of the FSAR and design bases documents.

VIOLATION 50-390/94-69-01, EXTENT OF CONDITION REVIEW

TVA's response to Notice of Violation 50-390/94-69-01 dated December 17, 1994 stated that a review of the documentation for similar essential vacuum relief valves on non-atmospheric tanks will be performed. It also stated that if corrective measures were required to address discrepancies identified by this review, the nature of the discrepancies and the required corrective action will be addressed in this response.

The review performed by TVA, sampled other vacuum relief devices in similar applications to investigate the design pressure of the valves compared to the pressure of the component to which they are attached. This review included a representative sample of components having vacuum relief devices from NSSS systems and balance of plant systems. Components reviewed included:

- CVCS Hold-up Tank A vacuum relief valve
- CVCS Hold-up Tank B vacuum relief valve
- Flood Mode Boration Non-Regen Demineralizer vacuum relief check valve
- Building Heating System Heat Exchanger vacuum breakers 0-CKV-012-0663 and 0-CKV-012-0664

The results of the review established that all components were designed appropriate for the intended application. However, in an effort to supplement the review of these components and ensure the depth of the review was appropriate, the following actions were performed:

- A search of the Equipment Management System (EMS) was performed to identify all Unit 0, 1, and 2 relief valves having the same INPO manufacturer and vendor codes as the Component Cooling System (CCS) surge tank vacuum relief valve, RFV-070-0539-S. The only valves identified in this search were the CVCS Hold-Up Tank vacuum relief valves which were assessed in the NSSS review.
- Each of the first interfacing valves connecting to the CCS surge tanks have been evaluated for acceptability of design conditions. The design pressures and temperatures of the valves were confirmed to be acceptable based on review of the valve drawings, field observation of the nameplate data, and previous design reviews performed to disposition a Nonconforming Condition Report (NCR).

VIOLATION 50-390/94-69-01, CORRECTIVE ACTION IMPLEMENTATION

The following discussion provides the status of the implementation of the corrective actions associated with Violation 50-390/94-69-01. As stated in TVA's response to this Notice of Violation, the adverse condition associated with the surge tank relief valve has been documented in TVA's Corrective Action Program as Problem Evaluation Report (PER) WBP940548.

In an effort to further ensure the correctness of the design and to ensure the reclassification approach will not affect the safe operation of Watts Bar, an additional review was performed. The conclusion of this review was that the planned corrective actions satisfy all applicable ASME code requirements. The review indicated that sufficient design analysis had been performed by TVA to substantiate that the valve is capable of a design pressure significantly higher than the 33 psig design pressure of the tank and that this is achieved without exceeding the ASME Section III allowable stresses. Based on the review it is apparent that multiple conservatisms in TVA's evaluations have ensured that all applicable code and design basis requirements are met or exceeded.

As part of this review, it has been identified that ASME Section III does not require heat exchanger tube rupture to be included in the overpressure protection analysis. Section III requires consideration of high probability or normal operating events. Section III does not require consideration of failure of other Section III components. In addition, TVA had an external review performed on this matter. Based on this review, it is TVA's understanding that Section III has never required consideration of tube failure in determination of overpressure relief requirements.

TVA's review also provided additional technical information which indicates that the initial design was in conformance with all applicable ASME criteria. The following summarizes the key points:

- a. The safety relief valve set pressure is 20 psig per drawing 30NC3001. The purpose of providing relief valves is to protect the components or system from overpressure. The general practice is to set the relief valve set point to protect the lowest rated component in the system. The vacuum relief valve has a design pressure of 22 psig which is the lowest rated component. Therefore, the safety relief valve set point protects the lowest rated component.
- b. Revision 0 of calculation O-HCG-LCS-090685 was prepared on December 23, 1985. The intent of this calculation was to confirm that the CCS surge tank is indeed protected with a surge relief valve set at 20 psig, recognizing the static head differential between the tank top and tank bottom. The calculation, using a conservative approach as noted in the calculation review form for calculation O-HAG-LAS-090085 dated December 11, 1991, confirms that the set point at 20 psig will not result in exceeding the tank design pressure of 33 psig.
- c. The tank design pressure of 33 psig (as noted on drawing 47W859-1) includes a pressure of 25 psig at the top of tank plus the maximum static head of fluid in the tank. This results in conservative design approach for the tank.
- d. The vacuum relief valve was conservatively assigned a design pressure of 22 psig, by adding 2 psig to the 20 psig pressure relief valve set pressure. This 2 psig increase is consistent with the ASME Section III 2 psig opening pressure tolerance, although this 2 psig is not required to be included in the design pressure.
- e. There is no ASME requirement for the design pressures of valves and tanks to be the same.
- f. TVA has records which document that this valve has successfully passed a hydrostatic test at 33 psig. Because of this, it can be rerated to 33 psig with no additional pressure testing. However, the ASME code does not address rerating. ASME subcommittee XI is currently considering proposed requirements for rerating. As currently proposed, and as approved by the responsible working group and subgroup, these requirements will be satisfied by the TVA approach.

WEAKNESSES DOCUMENTED IN INSPECTION REPORT 50-390/94-69

Inspection Report 50-390/94-69 documented five weaknesses. Three of which relate to design bases issues. The other two, the reach rod issue and the flange bolting issue, are not design bases issues. However, TVA's response to Notice of Violation 50-390/94-69-01 dated December 17, 1994, stated that the weaknesses documented in Inspection Report 50-390/94-69 would be evaluated and addressed with NRC. The following discussion addresses the specific corrective measures implemented for each weakness:

Weakness:

The Containment Spray System Description stated the system test line would provide flow as near as practical to spray operation flow. A calculation showed that the installed line would provide 15 percent less than spray operation flow. (Section 2.1 of Inspection Report 50-390/94-69)

Response:

The system description for Containment Heat Removal Spray System, N3-72-4001, was revised per DCN S-32943 to include the expected recirculation header flow rate. Paragraph 6.0 of the system description has been revised as follows, "Although not a test acceptance criteria, calculations predict a flow of approximately 3400 gpm through the test header (Reference 7.4.24). This flowrate is acceptable for pump performance testing."

Weakness:

The Containment Spray System Description indicated that the discharge pressure gages were required to have surge dampeners. Although the dampeners were installed, the installation was not depicted on the as-built drawings. (Section 2.4 of Inspection Report 50-390/94-69)

Response:

For Watts Bar, the specific panel instrument drawing is required to identify when pulsation dampeners are required. Drawing 47W600-16 provides the typical installation requirements which are used whenever a dampener is specified to be installed on a panel instrument drawing. To correct this problem for instruments 1-PT-72-15 and 1-PT-72-32, Drawing Deviation (DD) DD-94-0460 was initiated to indicate that drawing, 47W600-131, Revision 19, requires revision to indicate the installation of a pulsation dampener for instruments 1-PT-72-15 and 1-PT-72-32. DCN S-34117 has been issued to incorporate this information into the drawing.

In addition, the essential system descriptions were reviewed to determine if similar conditions, pumps that develop high flow and high heads to the Containment Spray Pumps, exists which would require pulsation dampening of pressure indicators. Similar conditions were not identified for the other systems.

Weakness:

The Unit 1 component cooling surge tank vent valve was installed backwards (i.e., in the wrong flow direction). This was not recognized and determined acceptable until questioned in this NRC inspection. (Section 2.2.2 of Inspection Report 50-390/94-69)

Response:

In an effort to address this weakness, TVA contacted the vendor of the vent valve, Automatic Controls. The valve is an air operated, fail closed, globe valve. The vendor and TVA concluded that the configuration of the valve seat, in conjunction with the heavy spring operator, would insure its successful closure against the surge tank maximum pressure. DCN S-33335 has been issued to add a note to vendor drawing CP3-6-53 that states that the valve is capable of bi-directional air flow. The DCN also serves to document the vendor's concurrence with the installed configuration.

Weakness:

Reach rod operators for manual RHR discharge valves and manual containment spray pump vent and drain valves were located too high for ready use. Also, their position indicators did not provide easily discernable differences between the open and closed positions. Indication and other problems on similar valves at TVA's Sequoyah facility had resulted in unplanned spills. TVA's review of the Sequoyah experience concluded that it did not apply to Watts Bar because the position indication was of a different type, not because it provided satisfactory indication. The NRC inspection team concluded that the experience review in this case had resulted in an inadequate review. Both the reach rod design and the Watts Bar experience review process were judged to be weak. (Section 2.1 of Inspection Report 50-390/94-69)

Response:

Based on discussions with the NRC inspectors that conducted the 50-390/94-69 inspection, the principal issue is whether the generic review performed at Watts Bar correctly assessed the condition documented at SQN. The Watts Bar review assessed whether the type of indicator that failed at SQN was being used at Watts Bar. The determination was that the position indicator installed at Watts Bar was of a different design that could not fail in the manner the SQN indicator failed. However, this review only considered one aspect of the remote operator problem. Other aspects of the problem are being addressed through TVA's experience review program. An Incident Investigation (II) initiated at Sequoyah Nuclear Plant (SQN), II-S-92-53, regarding reach rod problems, was submitted to Watts Bar for review. Based on this review a series of corrective actions was developed which principally relies on the performance of component test in accordance with Generic Test Procedure, GTMXXX-01. Tests performed in accordance with this procedure ensure the functionality of reach rod operated manual valves and associated indication devices. TVA considers the reviews that were performed to be adequate and that the generic/experience review processes functioned adequately. Therefore, no corrective action specific to this issue is required.

Weakness:

The majority of the bolts used to install a blank flange (for hydrostatic testing) at the discharge of a containment spray pump did not have adequate thread engagement. (Section 2.4 of Inspection Report 50-390/94-69)

Response:

At the time this item was identified by NRC, no procedural requirements were in place for verification of thread engagement for temporary bolting. However, to address the personnel safety aspect of this condition, Modifications Administrative Instruction (MAI) 4.7A, "Hydro Testing of Pipe," and MAI-4.7B, "Pneumatic Testing of Pipe," have been revised to include guidance for temporary bolting. The bolting problems associated with this specific example were reviewed by engineering personnel to ensure the nature of the problem and the procedural guidelines were understood. In addition, a notice describing the new requirements for temporary bolting was distributed to craft personnel.

ENCLOSURE 2

SUMMARY OF COMMITMENTS

1. The general problem documented in these items is being addressed by the Technical Specification (TS) Certification and FSAR Consistency Review program.
2. Separate from the above, an additional review will be performed to address the second item. To ensure required changes to the FSAR are being initiated based on the resolution of Test Deficiency Notices (TDNs), a review of TDNs will be performed by Nuclear Engineering. This review will establish for DCNs which were initiated based on TDNs, that required changes to the FSAR have been identified and submitted for incorporation into an amendment.
3. Although the sample results indicate that these programs will function to correct errors of the type noted by NRC and PAC/AQ, enhancements to strengthen the programs will be made by February 3, 1995. This will be achieved by adding guidelines to focus on these types of errors. Other potential problem areas, such as the consistency of references to industry standards, will also be addressed.