TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

April 3, 1981

Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 3100
101 Marietta Street
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - CONFIRMATION OF ACTION LETTER - SECOND INTERIM REPORT

In my letter to you dated February 27, 1981, TVA provided a response to the Confirmation of Action Letter dated February 10, 1981. This response reflected TVA's commitments discussed with NRC-OIE Region II employees on February 20, 1981. During a subsequent telephone conference on March 23, 1981, TVA noted that certain activities requested by the NRC letter would not be completed but will be addressed in a supplemental report to be submitted by April 30, 1981. Enclosed is the information discussed in the latest telephone conference.

The Quality Assurance organizations will audit other plants and other systems to determine if the deficiencies apply to other systems and to other plants. Deficiencies will be identified and corrected.

If you have any questions, please get in touch with D. L. Lambert at FTS 857-2581.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure
cc: Mr. Victor Stello, Director (Enclosures)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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ENCLOSURE
INTERIM RESPONSE TO
NRC CONFIRMATION OF ACTION LETTER DATED FEBRUARY 10, 1981
CONCERNING WATTS BAR NUCLEAR PLANT
SAFETY-RELATED HVAC SYSTEMS

I. ACTION TAKEN BY TVA IN RESPONSE TO CONFIRMATION OF ACTION LETTER

The following information summarizes the TVA actions taken and results obtained for each of the corresponding action items requested by the NRC Confirmation of Action Letter.

1. Selected elements of all safety-related HVAC systems covering design, procurement, construction, inspection, and testing were evaluated to verify that the completed systems meet applicable requirements. The overall verification process was carried out in two parts: (1) a verification covering the areas of design, procurement, and preoperational testing, and (2) a verification covering the areas of construction and inspection. These parts are described below as item 1.a. and 1.b.

1.a. Verification of Design, Procurement, and Preoperational Testing for Safety Related HVAC Systems

Plan

A program plan was developed, approved by TVA's Division of Engineering Design (EN DES) Quality Assurance Branch (QAB) and issued. The plan required: (a) selection from the list of all safety related HVAC systems of a representative sample composed of a segment from each system; (b) performing a "program verification" step to verify for each segment that a QA program was in effect to control design and procurement activities/documents; (c) performing a "commitment verification" step to verify for a representative sample of FSAR commitments that the commitments are being properly controlled; (d) verifying by sample audit that preoperational testing is being properly controlled; (e) identification and processing of deficiencies; (f) verifying by audit that steps (a) through (e) are properly executed.

Results

Steps (a) through (d) have been completed. Step (e) will be completed as described in item I.2 below. The audit step in (f) will begin about April 13 and will be completed in approximately two weeks. Results of steps (e) and (f) will be submitted to NRC in the supplement to this report. Evaluation of deficiencies identified by the "program verification," "commitment verification," and "preoperational testing," steps are being evaluated as part of item I.2 below.

In carrying out the program verification step, each safety-related HVAC system was identified. A total of 50 segments, one from each system, was selected to be verified. The segments selected were approved by EN DES Quality Assurance Branch. For each segment to be verified, the documents/drawings produced by EN DES to implement the design and procurement were identified. For each document/drawing that was listed the applicable engineering procedures and certain design input documents were identified. The verification process identified the date of the initial issue for the document or drawing, then we determined if the applicable engineering procedures and design input documents were issued before or after the original issue of the document/drawing. If the document/drawing was issued before an applicable procedure or design input document, then a Nonconformance Report (NCR) was written against the document/drawing.

The nonconformances written fall into the following six categories:

- Engineering procedures covering EN DES activities relating to drawing development and issue, issued after the original issue of the drawings (26 nonsignificant).
- Drawings issued before the issue of the applicable Design Criteria (2 nonsignificant).
- Design calculations not made for an issued drawing (1 significant).
- A Design Criteria not issued for a segment identified as being safety related (1 nonsignificant).
- A pipe support designation was erroneously identified as vertical instead of horizontal (1 nonsignificant).
- Lack of adequate vendor documentation for certain procurements (3 nonsignificant).

Based on the results of the completed program verification, we have concluded that there was a Quality Assurance Program in effect in EN DES when the design and procurement documents for the safety-related HVAC systems were being prepared and issued.

An area of concern we identified was that as our QA program evolved there was not an adequate reference between new procedures and their predecessors in all cases. Another area of concern we have identified is the lack of effective communication between the Division of Engineering Design (EN DES) and the Division of Construction (CONST) in defining the Quality Assurance requirements for safety-related HVAC systems and safety-related non-ASME Section III piping systems.

In carrying out the commitment verification step, a sample of 25 commitments affecting various segments of the safety related HVAC systems was selected by nuclear safety systems engineers, approved by EN DES QAB, and investigated for compliance by design engineers. Of these 25 commitments 21 have been satisfactorily met, 2 (involving testing) have not been completed because construction is not sufficiently complete to allow the required testing to be completed, and 2 have not been satisfactorily met.

Three nonconformances were identified and are being processed by established procedures. These nonconformances involve:

- o Lack of documentation of calculations and evaluations of the capability of a protective barrier (1 significant).
- o Location of ESF equipment in areas conflicting with FSAR statements (1 significant).
- o Inadequate documentation of the seismic qualification of a fire damper (1 nonsignificant).

Based on the results of the commitment verification, we have concluded that, in general, TVA FSAR commitments are being adequately controlled and are being met, except for the isolated deficiencies which are being evaluated as part of item I.2 below.

In verifying preoperational testing, the tests selected for audit were: TVA-6 "Air Return Fans" and TVA-14C "Diesel Generator Building HVAC". The audit team concluded that these tests were being adequately controlled with the exception of two audit deficiencies associated with test TVA-6. These two deficiencies related to:

- o Failure to process a nonconformance report (1 nonsignificant).
- o Incomplete information on responses to preoperational test deficiencies (1 nonsignificant).

The deficiencies are being processed by established procedures. The audit also reviewed actions underway to resolve technical problems previously identified during preoperational testing of the air return fans in the Reactor Building.

1.b. <u>Audit of Construction and Inspection of Safety-Related HVAC Systems</u>

<u>Plan</u>

Selected portions of each safety related HVAC system were audited by the Watts Bar Site QA Unit to verify that construction and inspection meet regulatory requirements. The audit included:

piping, electrical, instrumentation, and control systems; ducting, hangers and supports; associated QA records; and the verification that those selected portions of HVAC systems are installed in accordance with material, configuration, location and other design requirements.

Results

Eighteen subsystems were audited on a sample basis. Sixteen new audit deficiencies (15 nonsignificant and 1 significant) were identified during the audit and have been processed by established procedures. Previously identified deficiencies were not covered by this audit, but are being evaluated as part of item I.2 below. The types of new audit deficiencies identified are as follows:

- o Inconsistencies between construction process control documents and design drawings (1 nonsignificant)
- o Improperly labeled flow diagrams (1 nonsignificant)
- o Inadequate specification of QA requirements in contracts for duct components (1 nonsignificant)
- o Material received with CMTR's which does not meet specification (1 nonsignificant)
- o Inadequate control of certain seismic category I(L) (Limited Seismic Requirements) and non-ASME Section III piping (1 significant).
- o Inadequate control of certain storage/maintenance activities (2 nonsignficant)
- o Inadequate control of certain construction testing and inspection activities (5 nonsignificant)
- o Improper identification of certain material, welds, switches, etc. (2 nonsignificant)
- o Inadequate control of certain welding activities (2 nonsignificant)

Based on the number and types of audit deficiencies identified, the audit team concluded the adequacy of the construction site QA program for safety related HVAC systems is questionable. Further review of the Watts Bar construction site QA program is underway and corrective action will be taken by TVA management to ensure that completed systems meet applicable regulatory requirements.

2. Evaluation of Safety Significance of Deficiencies

In accordance with item 2 of NRC's Confirmation of Action letter, all nonconformances (NCR's) and audit deficiencies identified in item I.1 and I.3 are being evaluated for their potential impact on nuclear safety. This evaluation is performed in two ways: first, each significant deficiency or NCR is separately evaluated; and second, all deficiencies and NCR's, whether considered significant on nonsignificant, are evaluated together for possible generic safety implications. The generic review also incorporates evaluation of those deficiencies that were identified before the audit and are determined to be related to Watts Bar HVAC.

Preliminary review of individual deficiencies which impact on nuclear safety indicated that:

1. No safety-related components were identified as having deficiencies that would prevent the components from performing those safety-related functions.

2. Essentially all deficiencies involved the adequacy of documentation, inspection, and similar quality assuring activities. Such deficiencies lead to lower confidence in the ability of safety-related systems to perform their functions.

Since no major safety impact has yet been identified in individual deficiencies, these deficiencies (audit deficiencies and findings and nonconformances) are being evaluated, reported, and dispositioned under existing procedures. However, indications exist, based upon the aggregation of deficiencies, that an unacceptable number of program breakdowns have occurred and that this condition applies to other systems of similar type (and possibly to other plants).

3. A management review was performed to evaluate the corrective action taken on Audit WB-G-80-02. A summary of the results of this evaluation are as follows:

   a. The only area of HVAC systems identified by WB-G-80-02 as lacking a QA program was fabrication, installation, and inspection of HVAC ducting. Previous audits and other areas covered by WB-G-80-02 did not indicate lack of a QA program.

   b. Issuance of procedures to control fabrication and installation of duct work was the proper corrective action to take then but the delay in issuing these procedures (approximately 7 months) was excessive in view of the safety significance of the deficiency. In retrospect, TVA should have stopped work on the affected systems.

c. No documented evidence presently exists to verify that ducting processed before or after issuance of these procedures has been inspected for conformance to the procedures.

d. Management action should have been taken based on WB-G-80-02 to expedite issuance of procedures and to perform additional investigation to ensure that the lack of a QA program was indeed limited to ducting, as the evidence indicated.

Since Audit WB-G-80-02 was performed, other conditions adverse to quality (NCR's, audit deficiencies, NRC inspection findings, 50.55(e) reports) have been identified and are being evaluated as described in item I.2 above. The accumulation of these various findings raises questions as to the adequacy of the construction site QA program to ensure that completed systems meet regulatory requirements.

4. The above constitutes the written report on the TVA actions completed to date in response to item 4 of the NRC Confirmation of Action Letter dated February 10, 1981. The remaining actions to be addressed in the supplemental report are:

   a. EN DES Quality Assurance Branch audit of all activities performed as part of action item I.1.a above.

   b. Completion of the evaluation of safety significance of all deficiencies identified in executing action item I.1 above.

   c. Completion of the evaluation of all deficiencies as to their applicability and impact to other TVA sites.

   In addition to the above described actions taken in response to the NRC Confirmation of Action Letter, TVA has also taken the additional corrective action described in Section II below.

II. ADDITIONAL ACTION TAKEN BY TVA

1. Selected construction QA procedures covering safety related HVAC systems will be reviewed by EN DES to determine their adequacy with respect to controlling implementation of design requirements.

2. The OEDC QA Manager has directed that the focus and emphasis of 1981 OEDC audits should concentrate on identification of commitments and the identification of structures, systems, and components covered by the nuclear QA program. He has further directed that attention also be given to "limited QA", i.e. systems which are of lower safety importance but for which a QA program is required. Examples are radwaste, fire protection, security, and seismic Category I(L) (Limited Seismic Requirements) systems.

3. On March 27, 1981 the Watts Bar Site QA Unit Supervisor requested that a Stop Work Order be issued on seismic Category I(L) or ANS Safety Class (2b) HVAC Systems. On the same day, the Construction Engineer issued a Stop Work Order on installation of seismic Category I(L) piping systems not being installed per existing procedures. On April 1, 1981, the OEDC QA Manager directed a Stop Work Order on all Watts Bar safety-related HVAC fabricaton, eretion, and installation and testing.

4. In February 1981, EN DES initiated a program to investigate the adequacy of OEDC's efforts to fulfil commitments made to NRC, and to implement improvements in methods. The program has three parts.

   o Investigation of a sample of commitments - sample commitments are being chosen and identified. Emphasis is on Watts Bar Nuclear Plant but other plants are being addressed. The sample is being drawn from areas where concerns have been raised.

   o Initiation of improved methods - includes policy and procedural changes in regard to controlling and tracking of commitments, improved handling of responses and reports to NRC OIE to increase quality and accountability, and implementation of administrative steps to better correlate design and FSAR changes.

   o Analysis of the results and information gained in the above efforts to determine if additional investigations and/or procedures are required.

   As of March 26, 1981, the identification of sample commitments is well advanced, commitment investigation is started, with some investigations complete, and improved methods are being implemented. Over 300 commitments are to be investigated for TVA construction permit plants (more than 100 for Watts Bar Nuclear Plant alone).