

TENNESSEE VALLEY AUTHORITY  
400 Chestnut Street Tower II

June 1, 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:

SEQUOYAH, WATTS BAR, BELLEFONTE, HARTSVILLE, PHIPPS BEND, AND YELLOW CREEK  
NUCLEAR PLANTS - NRC RII INSPECTION REPORT 50-327/81-15, 50-328/81-15,  
50-390/81-07, 50-391/81-07, 50-438/81-12, 50-439/81-12, 50-519/81-06,  
50-520/81-06, 50-521/81-06, 50-553/81-04, 50-554/81-04, 50-566/81-03, AND  
50-567/81-03

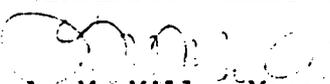
The subject inspection report dated May 6, 1981 cited TVA with one level IV  
and two level V violations in accordance with 10 CFR 2.201. Enclosed is  
our response. As noted within the inspection report, the first violation  
(concerning all plants covered by the report) does not require any  
response.

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

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

Very truly yours,

TENNESSEE VALLEY AUTHORITY

  
L. M. Mills, Manager  
Nuclear Regulation and Safety

Enclosure

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

ENCLOSURE  
SEQUOYAH AND WATTS BAR NUCLEAR PLANTS  
RESPONSE TO VIOLATIONS

Violation 327/81-15-02, 328/81-15-02

10 CFR50, Appendix B, Criterion V, as implemented by Sequoyah Nuclear Plant (SQN) FSAR Section 17.1a.5, requires in part, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, . . . and shall be accomplished in accordance with these instructions, procedure or drawings."

Contrary to the above, no documented procedures were prepared to prescribe the field survey of reinforced masonry walls in Category I structures, or to prescribe the preparation of as-built drawings, for the reinforced masonry walls.

This is a Severity Level V Violation (Supplement II.E.).

Admission or Denial of the Alleged Violation

TVA admits the violation occurred as stated.

The Reasons for the Violation

TVA conducted an investigation of its concrete masonry walls in category I structures at SQN in accordance with the Nuclear Regulatory Commission's (NRC) request (memorandum from NRC "To All Construction Permit and Operating License Applicants" dated April 21, 1980 and titled "Information Request on Category I Masonry Walls Employed by Plants Under CP and OL Review"). TVA's initial response to NRC was transmitted in a letter from L. M. Mills to A. Schwencer dated July 9, 1980. This response included an identification of all reinforced concrete masonry walls in the category I structures at SQN.

The response also included the design criteria (SQN-DC-V-1.1.1) for which the reinforced concrete masonry walls were designed and it also provided representative design calculations and drawings for the walls and the attachments to the walls. In preparing responses to NRC's questions, TVA determined that it would be necessary to develop an "as-built" history of the attachments to the reinforced masonry walls in order to verify compliance with the design criteria. The criteria required the following design of the reinforced masonry walls for live load:

20 lb/ft<sup>2</sup> on one side of the wall or 10 lb/ft<sup>2</sup> on  
each side of the wall.

The criteria further required that "Spacing of equipment and piping supports, restraints, and anchors must be controlled so that these live loads are not exceeded."

Due to a lack of identification and location of the in-place attachments to the walls, TVA was unable to verify whether the above live load requirements had been exceeded. Thus, it was necessary to conduct a field survey to locate and identify the attachments on the walls, including loads, to verify compliance with the design criteria. NRC was informed in the July 9, 1980 response that "TVA was investigating the in-place attachments to the masonry walls to verify compliance with design requirements."

Based upon discussions and meetings within the Division of Engineering Design (EN DES) employees, it was determined that the survey would be performed as follows: (The procedure for the survey was not documented in that it was believed it was not required for the design verification of the attachments on the wall. This was the basis for the violation.)

1. The survey was to be conducted by EN DES employees who were on site.
2. The issued drawings for the reinforced masonry walls and the attachments to the walls would be utilized as the "work sheets" to record the results of the field survey.
3. The survey was to locate the attachments, through physical measurements, and identify all attachments to the walls. This information was to be recorded on the drawings (work sheets) and provided to EN DES.

The field survey was conducted by EN DES employees and on site Division of Construction (CONST) employees between July 11, 1980 and July 31, 1980 and the results forwarded to EN DES. A meeting of EN DES employees was conducted on August 11, 1980 to discuss the results of the survey and to establish requirements for additional documentation of the survey and further analysis of the walls. This meeting was documented in a memorandum to the Civil Engineering Branch Files dated August 28, 1980. The "work sheets" were utilized to develop "full-size" drawings reflecting the identification and location of all attachments to the walls.

Utilizing the attachment loads, a conservative assumption was made for structural analysis purposes that all of the concentrated attachment loads on a given wall acted at the midspan of the wall and the wall acted as a beam spanning in the vertical direction. This structural analysis was completed and the analysis reflects that all of the attachment loads can be supported by a small fraction of the affected wall panel width. (The required width was never greater than one block in width). Thus, the attachment loads are not significant in the design of the walls (significantly less than the 20 lb/ft<sup>2</sup> design live load) and the walls are in compliance with design criteria, SQN-DC-V-1.1.1.

This verification of compliance with the design criteria was documented to NRC in a letter from L. M. Mills to A. Schwencer dated October 16, 1980.

It should be further noted that in TVA's July 9, 1980 response to NRC, calculations were provided that demonstrated the representative stress levels in the reinforced masonry walls due to dead load, live load (20 lb/ft<sup>2</sup>), and seismic loads. These calculated stresses versus stress allowables are as follows:

Calculated Stresses

$$\begin{aligned} f_s &= 4,749 \text{ lb/in}^2 \\ f_c &= 236 \text{ lb/in}^2 \\ v_c &= 3 \text{ lb/in}^2 \end{aligned}$$

Allowable Stresses

$$\begin{aligned} f_s &= 54,000 \text{ lb/in}^2 \\ f_c &= 1,350 \text{ lb/in}^2 \\ v_c &= 78 \text{ lb/in}^2 \end{aligned}$$

As can be seen by the comparison of the calculated stresses to the allowable stresses, a significant margin of available stress exists in the reinforced walls before the allowable stresses would be exceeded. That is, the walls reflect a very low stress level for the controlling case of dead load, live load (20 lb/ft<sup>2</sup>), and seismic loads.

Considering the original design stress levels in the walls and the results of TVA's conservative analysis of the in-place attachment loads on the walls, TVA believes that the field survey of the wall attachments as conducted and documented is adequate to verify compliance with the design criteria. TVA further believes the investigation does demonstrate that the walls are structurally adequate for the design loads with a significant margin of safety.

Corrective Steps Taken and Results Achieved

Based on the information previously presented, TVA does not believe there is a significant need for further verification of the field survey results of the attachments to the reinforced masonry walls. Thus, no additional field survey investigations are proposed.

As noted by the inspector's report, TVA's subsequent field survey of the nonreinforced masonry walls at SQN was fully documented and issued as to the procedures to be followed by field survey personnel. TVA has issued field survey procedures for all masonry wall inspections subsequent to the SQN reinforced masonry wall survey. TVA will insure for future field surveys of masonry walls that documented procedures are issued for usage by inspection employees.

Corrective Steps Taken to Avoid Further Noncompliance

For future field surveys of masonry walls, TVA will develop and issue detailed procedures addressing: Personnel requirements for the survey; specific information required from the field survey; the actions or steps necessary to achieve the required information to include verification and checking of field data; and the required documentation and usage of field survey results.

EN DES will issue guidelines requiring the above action for all field surveys which are related to civil concerns.

Date When Full Compliance Will Be Achieved

We are now in full compliance on this item and the guidelines noted above will be issued by June 30, 1981.

Violation 327/81-15-03, 328/81-15-03, 390/81-07-02, 391/81-07-02

10CFR50, Appendix B, Criterion V, as implemented by Sequoyah and Watts Bar FSAR Section 17.1a.5, requires in part, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, . . . and shall be accomplished in accordance with these instructions, procedures, or drawings." Engineering Procedure EN DES-EP 1.28 requires that distribution of design documents affecting quality be controlled.

Contrary to the above, distribution of EN DES procedures and design criteria to the EN DES site representatives at the Sequoyah and Watts Bar sites was not controlled.

This is a Severity Level V Violation (Supplement II.E).

Admission of the Alleged Violation

TVA admits the violation occurred as stated.

Reason for the Violation

Sequoyah and Watts Bar Design Project (SWP) erroneously considered the site representatives to be an integral part of the design project and thus were "covered" by the controlled documents assigned to SWP (Knoxville). The responsible section supervisor is responsible for ensuring the site employees are aware of the necessary procedures and design criteria. At the time of the inspection the representatives at both sites had copies of the appropriate EP's, design criteria documents, etc., although they were not controlled copies as required.

Corrective Steps Taken and Results Achieved

SWP has arranged for controlled copies of all EP's to be sent to both sites for use by the design representatives there. Selected design criteria will be sent by the Engineering Services Staff Document Control Center to the sites. All required copies of design criteria shall be submitted to each site to be placed in a controlled file. These files will be maintained as long as appropriate.

Corrective Steps Taken to Avoid Further Noncompliance

Corrective actions as stated should preclude this condition from recurring at Sequoyah and Watts Bar. Other nuclear plant project managers have been informed of this condition to prevent its recurrence at their sites.

Date When Full Compliance Will Be Achieved

TVA will be in full compliance by June 15, 1981.