TENNESSEE VALLEY AUTHORITY
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JAN 29 1988

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

Gentlemen:

In the Matter of	)	Docket Nos. 50-327
Tennessee Valley Authority	)	50-328

SEQUOYAH NUCLEAR PLANT (SQN) - INTEGRATED DESIGN INSPECTION (IDI): NRC INSPECTION REPORT NOS. 50-327/87-48 AND 50-328/87-48

Your letter dated January 20, 1988, identified four general observations that you believed had been omitted from the December 29, 1987 response to the subject inspection report.

Enclosure 2 of the TVA letter provided a response to each of the four general observations in question, as you requested, as well as a response to each of the general observations discussed at the NRC follow-up inspection exit meeting held in Knoxville, Tennessee, on November 19, 1987.

A summary of the response for each of the four general observations is provided below.

Lack of Timely Corrective Action

TVA previously recognized the need for improvement and discussed an improvement plan in TVA's Nuclear Performance Plan (NPP) Volume 1. Procedural enhancements have taken place to consolidate Condition Adverse to Quality Report (CAQR) procedures into one standard format which specifically addresses timely corrective action. The new CAQR program includes an escalation process to successively higher levels of management to ensure timely implementation of corrective action.

Perceived Weakness in the Design Verification Process

TVA previously recognized this as a weakness and it was addressed in the NPP Volume 2. The Division of Nuclear Engineering (DNE) procedures have been revised to include a detailed verification checklist to aid the reviewer in performing a thorough consistent review. Additionally, DNE procedures have been revised to include a technical adequacy review and an independent review subsequent to the preparation and review of the initial calculations. Enhancements also include training on these procedural revisions and an active technical audit program to monitor implementation of this revised program.

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Lack of Timely Implementation of Changes to Operating Procedures Resulting from Design Changes

The following positive actions have been taken to address the engineering/plant interface: establishment of a new design change process; enhancement of the DNE and Operations staff interface; integration of system-oriented engineers into the plant organization; establishment of DNE in an advisory role with the Plant Operations Review Committee; engineering coverage for plant evening shift activities; enhanced Operations/DNE management on team actions; and multidiscipline engineering support in daily War Room meetings.

Lack of System Integration

TVA recognized the need for improvement as discussed in NPP Volume 1. Additionally, the need for increased interface with plant Operations was also recognized in NPP Volume 2.

The concept includes the three types of system engineers: plant system engineers, project system engineers, and a discipline staffed system engineering specialist. Each level of system engineer has been assigned specific responsibilities to support the system engineering concept.

Should you need additional sssistance in resolving this matter, please telephone D. L. Williams at (615) 632-7170.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

Original Signed By
M. J. Ray
M. J. Ray, Deputy Director
Nuclear Licensing and
Regulatory Affairs

Enclosure
cc: See page 3

U.S. Nuclear Regulatory Commission

JAN 29 1988

Enclosure
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TITLE: Lack of Timely Corrective Action

SUMMARY OF ITEM:

One item observed by the team was an apparent lack of timely corrective action in the Division of Nuclear Engineering (DNE). For example, the problems discussed above regarding the seismic analysis of the steel containment vessel and the unrelated issue of the ERCW design p[illegible]ere known to TVA in 1986; however, up to the time of the IDI, DNE had not resolved these items.

RESPONSE:

TVA identification of this programmatic weakness, as discussed in section 4 of the NPP Volume 1, has resulted in the formulation and implementation of a controlled and standardized ONP corrective action program which is addressed under the NQAM (Part I, Section 2.16), NEP-9.1, and other applicable ONP implementing procedures. Specifically, each major flow process and action step is tied to a finite time constraint; e.g., approved corrective action plans will be provided within 60 calendar days of origination of the CAQ and tracked by site and geographically assigned CAQ coordinators utilizing the Tracking and Reporting of Open Items (TROI) system.

In addition to the above, TVA management has taken the following actions to increase overall management involvement in the CAQ resolution process. The Manager of Nuclear Power issued an April 15, 1987 memorandum to focus additional management attention on the resolution of unresolved CAQs issued before implementation of the NQAM, Part I, Section 2.16, Revision 2, and to direct that these conditions be given equal or greater priority than normal production work. Specifically, project teams, composed of responsible individuals from divisions and project work locations, have been formed to review unresolved CAQs and to make determinations regarding validity and relative importance. After segregation and administrative closure of outdated issues, duplicates, CAQs affecting only cancelled plants, or others not needing further attention, the remaining items have been prioritized based upon their relative importance to support plant safety and restart.

A built-in feature of the CAQ program is the escalation process. Through the use of geographically assigned CAQ coordinators, CAQs which are not resolved within procedure mandated timeframes are escalated to successively higher levels of management until resolution is achieved. The only purpose of this process is to promote timely corrective action.

TITLE: Lack of Timely Corrective Action (Continued)

RESPONSE: (Continued)

A major element of the corrective action process is the timely completion of generic review evaluations and investigations of CAQs throughout ONP. Engineering Assurance (EA) has been assigned the responsibility to: evaluate potentially generic concerns involving DNE organizations and to investigate and follow up on delinquent project responses. EA provides both continual monitoring of this process and monthly status reports to DNE organizations with delinquent generic review responses.

EA, as program sponsor for DNE's support of the ONP corrective action program, has instituted several actions designed to promote better control and timely implementation of corrective action. Specifically, an extensive DNE effort is underway to fully utilize TROI through the use of discipline/unit coordinators from DNE branches and projects. Secondly, EA staffing plans have included the designation and project assignment of Engineering Assurance Engineers (EAEs) to support and control the CAQ process on projects for DNE activities; EAEs will be integrally involved in the control and administration of the process, as well as providing review and approval of corrective action plans and verification of implementing actions. In the interim, the EA-Knoxville Problem Reports Section has assigned, on a part-time basis, generic review engineers to work with engineering projects to determine more effective in-process methodologies to promote timely corrective action.

TITLE: Lack of System Integration

SUMMARY OF ITEM:

The design of a nuclear plant is complex in that many systems and components have multiple functions and interact with each other in ways that are not always obvious. These subtle interactions, if not understood and evaluated can cause severe safety problems. In reviewing a number of the findings, it appeared to the team that systems interactions were not always considered.

RESPONSE:

TVA has recognized a need to improve in performing system engineering. This need is addressed in NPP Volume 1, Section IV-E-2. Additionally, the need for increased interface with plant operations was also recognized in NPP Volume 2, Section II-1.2, from the plant operating staff aspect.

DNE has been developing an improved concept for system engineering. The first step already taken to address this issue is the restructuring of the engineering function as described in NPP Volume 1, Section IV-E-2. This included establishing design control within a site engineering function at each nuclear plant. This organization is headed by a project engineer with multi-discipline support in the form of discipline lead engineers. The project engineer has direct and close control over the work produced.

In addition, the DNE program to support the system engineering concept is being developed. The concept at this time is to include three types of system engineers. System engineers are being established in the plant (Plant System Engineer) and in the design project (Project System Engineer) onsite. The responsibilities of both the plant systems engineer and the project systems engineering functions will be procedurally defined and understood by both sets of engineers. Both system engineers, along with maintenance engineering, shall support the operations and maintenance of the plant. It will be the responsibility of each of the systems engineers to work closely and ensure coordination with his/her counterpart in either project or plant systems engineering. The plant systems engineer will, for example, be involved in the review of change documents, test documents, licensing aspects of modification, troubleshooting, and review of design criteria and system descriptions as they apply to system operation characteristics. The project system engineer will, for example, review change documents, develop expertise and design philosophy for engineering changes, review and provide test scoping documents, review licensing commitments (FSAR) as they apply to the design of modifications. Also, a discipline staffed system engineering specialist is being established in the branches, to provide the technical input to the system change process and provide inputs to the procurements of hardware to support modifications. The system engineering specialist will maintain this expertise and knowledge through close involvement with the nuclear industry.

This program is currently being developed for SQN and an update will be given to NRC by April 1, 1988.

TITLE: Perceived Weakness in the Design Verification Process

SUMMARY OF ITEM:

In view of the problems previously discussed regarding the adequacy of the structural calculations, the use of incorrect dimensional information on pipe support and equipment calculations and the improper use of the piping codes of record, the IDI team concluded that weaknesses existed in TVA's design verification process during the initial design. TVA needs to strengthen its design verification program. In addition, TVA should address the generic implications for calculations that have not been recently regenerated or reviewed as part of their calculation review program or other ongoing programs.

RESPONSE:

The corrective action to ensure the technical adequacy of essential calculations is provided in Volume 2 of the Nuclear Performance Plan. These programs, which are essentially complete for SQN unit 2, provide the needed assurance for design changes and supporting calculations for restart.

As described in TVA's Nuclear Performance Plan, some technical weaknesses--such as poor documentation, lack of clarity, and thoroughness--have been discovered in the implementation processes DNE used in producing and reviewing calculations.

Programmatic improvements have been made by the issuance of revised procedures and instructions for generation of calculations and for controlling changes to design documentation. Nuclear Engineering Procedure 3.1, Calculations, requires that all calculations be verified per the requirements of NEP-5.2, Review. The review procedure includes a detailed verification checklist to aid the reviewer in performing a thorough consistent review. In addition, DNE Interim Order to NEP-3.1, revision 1, issued November 19, 1987, requires that calculations receive a technical adequacy review and an independent review subsequent to the initial calculations preparation and review. (This interim order incorporated the applicable sections of NEP-5.2 and NEP-3.1.)

The programmatic improvements, training, and an active technical audit program through Engineering Assurance to monitor implementation of these changes should preclude recurrence.

TITLE: Lack of Timely Implementation of Changes to Operating Procedures Resulting from Design Changes

SUMMARY OF ITEMS:

Another area identified as a general observation that needs the attention of TVA management is the lack of timely implementation of changes to station operating procedures resulting from design changes made by the Division of Nuclear Engineering (DNE). For example, a "temporary change" made in 1982 disconnected the wiring and logic for the automatic operation of the ERCW traveling screen. However, from that time until the present (5 years) TVA did not have a procedure for manual screen operation.

RESPONSE:

Positive actions have been taken to address the observed weakness in the engineering/plant interface. These actions are directed at improving the exchange of technical information, timeliness, and responsiveness between DNE and plant sections, and at enhancing the team concept. This increased management attention and improved communications will facilitate clear and expeditious problem identification, allowing for prompt operability and reportability decisions as well as expeditious resolution and closure of deficiency reports. These actions are listed below:

1. Programmatic changes have been implemented in the design change control process that improve both the engineering control and responsiveness to plant needs. This includes a new design change notice process that allows DNE to issue a complete engineering change package on a real time basis to support plant operations.

2. DNE and the Plant Operations Review Staff (PORS) interface is being enhanced through: (a) DNE support of condition adverse to quality reports and potential reportable occurrence evaluation for PORS to be under direct responsibility of an assistant project engineer; (b) direct face-to-face communication among responsible DNE and PORS personnel to establish the engineering support required and the schedule to support PORS evaluation; and (c) direct face-to-face communications among responsible DNE and PORS personnel to provide the requested engineering information to PORS to ensure that adequate technical information has been conveyed.

TITLE: Lack of Timely Implementation of Changes to Operating Procedures Resulting from Design Changes (Continued)

RESPONSE: (Continued)

3. The establishment of a DNE/Operations systems engineering troubleshooting team in which a multidiscipline team of systems-oriented engineers has been integrated into the plant organization to identify and resolve system and component issues related to design, modifications, or maintenance. The integrated systems engineering team will spend more time in the plant, working closely with maintenance to understand problems and develop appropriate timely corrective action.

4. Establishing DNE in an advisory role with the Plant Operations Review Committee.

5. Multidiscipline engineering coverage for plant evening shift activities for efficient technical interface and timely support of modifications and maintenance activities.

6. Enhanced Operations and DNE management attention on team actions and improved communications between DNE and Operations personnel.

7. Multidiscipline engineering support and interactions in daily "War Room" meetings with plant management in support of modifications and maintenance activities supporting restart.