



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF SPECIAL PROJECTS

EMPLOYEE CONCERN ELEMENT REPORT 21302

"INADEQUATE ELECTRICAL TESTING, PLANNING

AND ENGINEERING PARTICIPATION"

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

I. SUBJECT

Category: Engineering
Subcategory: Electrical Testing and Planning (21300)
Element: Inadequate Electrical Testing, Planning and Engineering
Participation (21302)
Employee Concern: WI-85-100-018 and IN-86-077-001

Element Report 21302, Revision 2 prepared May 7, 1987, is based on an anonymous employee concern stating, "Electrical testing and planning is inadequate. Engineering either does not address testing or does so inadequately. Acceptance criteria for testing are inadequate to non-existent". Also, another concern states, "Deviations to pre-op test acceptance criteria were accepted by ENDES without written justifications. It can not be determined by the documentation in the test package whether or not a detailed evaluation of the deviation was performed by ENDES."

II. SUMMARY OF ISSUE

TVA reviewed this concern and found with some minor deficiencies that: (a) overall preoperational and postmodification test programs for electrical systems and equipment were found to be adequate and (b) engineering provided adequate acceptance criteria. NRC reviewed this item but could not concur with the TVA finding. During a meeting on February 10, 1987, NRC requested additional information to complete the review. TVA has since provided additional information.

III. EVALUATION

NRC and its consultant, SAIC, reviewed the TVA employee concern. TVA in their evaluation described in detail the participation by Engineering (which is led by Nuclear Engineering and supported as required by other engineering

disciplines). TVA discussed an additional review of testing documents for nine selected systems. TVA did not discuss what electrical items were reviewed in this special review of the nine systems but concludes that adequate electrical planning and adequate electrical testing was performed for the nine selected systems. NRC requested additional information (RAI) to describe the required participation of electrical engineering in test document preparation review, approval, and signoff. NRC requested details of the method used by the electrical engineering group to specify electrical acceptance criteria such as verification of motor running current; motor correct rotation; relay operation verification, including pickup and drop out voltages; proper diesel generator load sequencing verification; and verification of correct meter operation and indicator lamp operation.

NRC with its consultant SAIC met with TVA on February 10, 1987, in the Bethesda offices of TVA to discuss this concern. During that meeting TVA presented TVA engineering procedure ENDES-EP6.01 which describes the Engineering (Nuclear Engineering) role in preparing for and conducting tests at Sequoyah. However, this document does not clearly describe the method to provide electrical review and acceptance criteria information. TVA indicated that this is accomplished through TVA squad checking. TVA sent Engineering Procedure EN DES-EP 4.04 which describes the TVA squad checking process to NRC/SAIC on February 19, 1987. However, a review of this procedure did not clearly define the TVA method in which electrical input is obtained for testing and electrical review of test information is performed. NRC reviewed this matter again during a visit to the TVA Knoxville offices on March 2-4, 1987. During this visit NRC obtained a listing of all Sequoyah system preoperational tests. The listing identifies about 168 Sequoyah system tests. NRC randomly audited several test documents for indications of electrical participation. TVA-22, Auxiliary Feedwater System, was one preoperational test selected for the NRC audit. NRC reviewed three letters (Memo from Patterson to those listed, dated September 19, 1975; Memo from Patterson to those listed, dated March 1, 1979; and Memo from Patterson to those listed, dated February 9, 1981) which showed evidence of electrical participation in the TVA-22 testing. These letters, while showing electrical activities in TVA-22, were somewhat confusing in that they tend to indicate that the electrical engineering group was requested to participate in only 11 of the 168 preoperational tests. During the discussions at Knoxville, TVA personnel were not able to explain the intent of the three letters, nor were they able to explain how electrical input and review of all Sequoyah test documents was in fact achieved. As a result, NRC could not independently conclude that adequate electrical testing and planning was performed at Sequoyah.

On May 28, 1987, TVA revisited this employee concern and provided Revision 2 of the report to NRC. Specifically, TVA increased the scope of the electrical review to include 19 Unit 1 system test documents and 14 Unit 2 test documents. Moreover, TVA responses to employee concerns 21301 and 21303 show that this issue was also reviewed and the concern confirmed in the plant security system, instrumentation and controls, communications, lighting, the EOF, safety related display instrumentation, emergency fire protection communication system, and other areas. Additionally, NRC has been reviewing related Sequoyah electrical and I&C calculations for compliance to electrical standards.

IV. CONCLUSIONS

Based on the additional material presented in the May 28, 1987, revision to the employee concern and on the related reviews for employee concerns 21301 and 21303, the NRC staff concludes that electrical testing and planning was poorly documented and the testing requirements difficult to find and assess. However, the current TVA review activities which are reconfirming and even redoing much of the TVA electrical engineering branch activities should result in an appropriate assessment of electrical engineering branch activities. TVA compliance with the resolutions of the employee concern in Element Reports 21301 and 21303 will acceptably address this employee concern.