



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

OCT 25 1978

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MEMORANDUM FOR: R. Satterfield, Chief, Instrumentation and Control
Systems Branch, DSS

FROM: D. R. Lasher, Reactor Engineer, Instrumentation and
Control Systems Branch, DSS

THROUGH: M. Srinivasan, Leader, Section B, Instrumentation and
Control Systems Branch, DSS

SUBJECT: RECORD OF CONFERENCE CALL WITH TVA REGARDING OPEN ITEMS
IN SEQUOYAH SER

On September 21, 1978, the staff participated in a conference call with representatives of TVA regarding the resolution of open instrumentation and control items in the Sequoyah draft SER. Twenty open items that were contained in a listing prepared by the staff dated September 7, 1978 were discussed in detail and commitments were made by TVA toward resolving many of them. The attached report of the discussion on each item was generated from notes taken during the conference call by the two participating staff members. The purpose of this report is to document the staff's understanding of the discussion and the commitments made by TVA.

A list of participants is given in Attachment D. The item numbers in Attachment A (the report) correspond to the item numbers in Attachment C (the September 7 listing).

The staff is of the opinion that the commitments made by TVA and the understanding gained through the discussion as documented in this report remove the necessity for a further meeting with the applicant prior to the issuance of the SER.

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ATTACHMENT A

Record of Conference Call with TVA Regarding Sequoyah 1, 2 SER Open Instrumentation and Control Items

1. Response Time Testing of Safety-Related Sensors and Equipment:

TVA is revising a general scoping document which is to be included in the FSAR by 11/15/78. Detailed procedures are now being developed. For unit 1, the detailed procedures covering only the ESF will be available by 1/1/79. The remainder will be complete by 2/15/79. This is to be essentially the program developed for Trojan with modifications to fit it to Sequoyah's systems. A written commitment to pursue and implement this scheduled program will be available to the staff by mid October. The staff will arrange to audit randomly selected examples of these procedures on a site visit.

2. Seismic Qualification of Ex-Core Neutron Detectors:

The staff needs the results of this testing documented in the FSAR. It is our understanding that these tests have been completed by Westinghouse. TVA presently believes they can include the results in the FSAR by 11/15/78. They will confirm this date and provide more complete status.

3. Field Modifications to SSPS General Alarm Warning Circuits:

TVA advised the staff that these modifications to the SSPS General Warning Alarm Circuit to preclude the possibility of negating scram in both channels has been completed. They will report this completion by letter to the staff. The staff believes that this will be sufficient to satisfy this concern.

4. Removal of All Power to CRDM Circuits Upon Scram:

TVA has responded to this concern in their letter of 9/12/78. The response is to item 9 of the 11/18 question list. The staff is to review this response for adequacy.

5. Saturation Effects Testing on Ex-Core Neutron Detectors and Safety-Related Radiation Monitors:

TVA is to get the necessary information from Westinghouse on the ex-core neutron detectors. The detectors that initiates containment isolation on high radiation is a scintillation monitor. TVA is to obtain and provide the basis for exempting the scintillation monitors from the saturation effects testing program. The staff can expect some response by 10/15/78.

6. Qualification of TVA-Supplied Valve Motor Operators for Use Inside Containment:

TVA states that all BOP valve motor operators furnished for use inside the containment are Limitorque operators of the same type previously qualified by Westinghouse for use inside containment. Tables 3.11-4, 5 have been changed to show the new operators and qualification documentation. An explanatory note probably should be added to these tables for these changes and is to be supplied by TVA.

7. Documentation of Commitment to Provide Class I Air Supply For Auxiliary Feedwater Control Valves:

TVA states that this commitment is contained in FSAR Section 10.4.7, page 10.4-23, the first sentence. TVA has agreed to change the wording

to substitute "Category I Air Supply" for "ESF quality - - - " to eliminate any possible ambiguity in this commitment to make the controls and instrumentation for the Auxiliary Feedwater System meet safety system requirements.

8. Maintenance of Independence Through Common Testing Arrangements:

TVA is to review any common testing arrangements that may exist in the RTS and ESFAS to evaluate the degree of separation and isolation provided and to evaluate susceptibility to common mode failures. Response is to be made in 11/15/78 Amendment.

9. Flooding of RST and ESF Sensors and Equipment:

TVA states that FSAR Appendix 2.4A provides a summary description of detailed procedures and measures that will be followed to protect essential safety-related systems in the event of flooding due to natural phenomena. This document states that the safety-related equipment that is needed to maintain the plant in a safe condition during and after a design basis flood is either located above the design basis flood level, located inside a non-flooded structure or is designed for submerged operation. Unneeded circuits and equipment that are located below the DBF level will be deenergized and disconnected as part of the preflood preparation to avoid short circuits and consequent undesirable interactions with essential safety-related equipment. The NRC staff will conduct an audit of these detailed procedures on a site visit.

TVA has also stated that FSAR Section 8.3 will be revised to include a listing of the systems and equipment that must remain functional during and after such design basis floods.

Flooding from fire fighting activities is covered in TVA's 1/24/77 letter. TVA complies with item (i). The staff will review this information.

With regard to potential flooding of equipment in ECCS pump rooms, TVA states the equipment is protected by breakaway panels that cover passages to large passive sumps. Also flood levels are given in the response to question 8 in the 9/12/78 TVA letter.

10. Environmental Qualification of BOP Class 1E Equipment:

- (a) TVA states that the bases are established by testing or analyses to show conformance to NEMA, ISA and ANSI standards of the same or similar items. The staff has considered this concern and has concluded that it will require the applicant to supply for our review copies of the test reports that show the equipment meets the requirements of these industry standards for representative items of electrical equipment and instrumentation and control equipment. For instance submit reports for the following:
- (1) 6.9 Kv D.G. breaker, (2) RWST level sensor, (3) 480 V M.C.C.,
 - (4) 125 V battery charger, (5) control room vent radiation monitor and
 - (6) containment isolation valve motor operator.
- (b) and (c) - not discussed, these items are being reviewed by the staff
- (d) TVA is still completing the details of the environmental monitoring system. TVA believes they will have it in the hands of the staff by 10/15/78.

11. Requalification of Sensors For Steam Line Break Inside Containment:

TVA stated they have received response from Westinghouse and will send us what they can. They have prepared analyses and design requirements on temperature, humidity etc. limits but have not completed the specific instrumentation qualification documentation.

12. Disposition of System Ground Support Tower:

TVA indicated that they were aware of the concern but could not take specific action without a formal request from the staff. We will send them such a formal request.

13. Provision of Physical Separation For 125 VDC Leads in 6900 Volt Shutdown Boards:

TVA has supplied additional information regarding the completion of action taken to provide the required separation. The staff considers this sufficient to satisfy the concern.

14. Protection of Containment Penetrations Against Physical Damage From Electrical Faults:

(a) TVA will correct paragraph 1 of the Design Basis on page 8.3-29a and submit to the staff.

(b) This portion of the response will be revised to state that only the neutron monitors use connectors. These are not qualified for high temperature since cables and monitors are not required to function in event of SLB inside containment. Terminal blocks, where used, are qualified as part of the equipment they are included in. The majority of the

circuits are spliced using crimped sleeves and heat shrinkable tubing as insulation. These splices are qualified for the SLB environment.

(c) TVA states that short circuit tests are applied to the penetration prior to its being tested for leakage. This confirms its ability to withstand the mechanical stress due to the subtransient currents. Thermal heating of the conductors has been determined by the manufacturer to be the worst case event and has therefore formed the basis for the time-current damage curves presented in the FSAR. The short circuit test description and results are in the package of information submitted on penetrations.

(d) The operating times quoted in the time-current damage curves are the maximum-minimum operating times that include sensing time, logic time and transit times in addition to breaker operating time. Also in response to a further concern regarding seismically-induced damage to wiring inside containment giving rise to penetration damage in the event that the breakers fail to open following the seismic event, TVA stated that all wiring and equipment located inside the containment was seismically qualified and supported so that it would remain operable in the event of a design basis seismic event. We conclude that this commitment removes the need for seismic qualification of the non-class 1E breakers that protect the penetrations.

15. Color Coding of Safety-Related Circuits and Equipment:

TVA indicated that they are aware of the concern but will not be able to take specific action without a formal request from the staff. The staff will reconsider the concern and if found to be necessary will issue such a formal request.

16. Qualification of 125 VDC Safety-Related Loads For Operation At
Equalizing Charge Voltages:

TVA will state that such equipment remains connected to the 125 VDC battery busses during equalizing charges and is qualified for operation at the equalizing charge voltage of 140 volts.

17. Deletion of Description of RTS From FSAR:

TVA states that this is an inadvertent editorial action and that the paragraph will be replaced in the 11/15/78 Amendment to the FSAR. Draft copy of revised page will be sent for staff review by 10/15/78.

18. Loss of Position Indication To Cold Leg Accumulator Isolation Valves:

TVA indicates they believe that the power lockout fix using extra switch contacts and plastic covers over the control switch handles applied to these valves. The staff believes that power lockout by racking out the circuit breakers is required. The staff will check further and advise. If the breakers are required to be racked out, TVA will be required to devise means to meet the BTP 4 and 18 requirements that are independent of the MCC control power.

19. Description of Relocated RCP Underfrequency and Undervoltage Trip
Sensors and Signal Handling Equipment:

TVA stated that revised figure 1.2-4 will show the new location as being on the next lower elevation from the Shutdown Boards in the Auxiliary Building. They also stated that the description of the cabinets would appear in FSAR Section 7.2. The staff should have a draft by 10/15/78 with the final version appearing in the November Amendment.

20. Qualification of Stem Mounted and Gear-Driven Limit Switches on

Power Actuated Valves:

TVA stated that these switches have been changed to NAMCO switches which are qualified for their expected environment. TVA has received and has responded to I&E Bulletin 78-04. They are sending us a copy of their response which should clarify and satisfy this concern. 9/26/78 - We have received and reviewed the TVA response to I&E Bulletin 78-04 for Sequoyah and found it acceptable.

ATTACHMENT B

PARTICIPANTS

TVA:

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