February 26, 1988

Docket Nos. 50-327/328

Mr. S. A. White
Manager of Nuclear Power
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. White:

SUBJECT: APPENDIX R CONCERNS RELATED TO SEQUOYAH UNIT 2 RESTART

Re: Sequoyah Nuclear Plant, Units 1 and 2

Recently, allegations have been raised concerning the Appendix R evaluation of the Sequoyah units made by the Tennessee Valley Authority (TVA). To complete our evaluation of these allegations, the staff needs the information listed in the enclosure to this letter. The staff considers the resolution of some of these allegations a restart item for Sequoyah Unit 2; therefore, we need this information as soon as possible for us to meet your schedule for Unit 2.

The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Sincerely,

for
Gary G. Zech, Assistant Director
for Projects
TVA Projects Division
Office of Special Projects

Enclosure:
As stated

cc w/enclosure:
See next page

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ENCLOSURE

1. Provide the calculations supporting the TVA Task Group's opinion that the release of RCS water into the containment with only technical specification allowable levels of failed fuel does not result in an unacceptable off-site dose and thus the need for containment integrity as described in A.2 - Radiation Release to the Environment - of TVA's "Task Group Disposition of Issues."

2. Provide the information supporting the TVA Task Group's conclusion that boiling of the spent fuel pool is not a technical concern. With respect to this conclusion address the HVAC system's ability to rapidly and effectively mix and dissipate steam ingested into the ventilation system. Provide justification that any resulting condensation would not adversely affect safety related equipment. Discuss effects of any resulting contamination.

3. Provide results of the procedure review conducted to review the coordination of procedures for fire effects to determine if there are potentially confusing areas between procedures as discussed during the NRC/TVA staff meeting in Knoxville on January 5, 1988.

4. Describe how SOI 26.3, Revision 1, provides adequate boron concentration for a cold shutdown condition after a worst case Appendix R fire. If "pressurizer level fluctuation" is used as a depressurization mechanism provide the procedures controlling this evolution and provide the calculations showing its effectiveness, i.e., depressurization rate vs. time. Provide the calculation justifying use of one train of RHR to cool the plant to less than 200°F. Provide the Performance Curve for one train of RHR. Discuss availability of an operable pressurizer PORV, pressurizer heaters, auxiliary spray and normal spray for postulated fire scenarios.

5. Provide the clarification of the minor revision to shutdown logic on Key 37 as discussed in A.9, Pneumatic Systems of the Task Group Disposition of Issues. Does TVA take credit for use of any control air system during an Appendix R event? Can the plant be shutdown and controlled including operating in a solid configuration if needed without the use of any air system? Please provide justification to support any statements regarding your conclusions.

6. Explain why the primary plant will not lose the pressurizer bubble in any fire scenario such that 19 hours is a conservative value for requiring the availability of RHR. Does TVA take credit for plant operations in a water solid condition to cooldown following a fire and prior to entering cold shutdown? If so, describe the operating procedures and operator training which is conducted for these water solid plant operations.

7. Provide justification for repair times for FCV-74-1 and FCV-74-2. State why these valves are considered operable for fires inside containment. In particular provide valve location information and describe how persons entering containment following a fire could be expected to repair and manually position these valves. If reactor head vents, pressurizer block valves and the pressurizer PORV are spuriously opened, discuss the effect on containment environment and RHR valve accessiblity.

8. Discuss the possibility of lubrication oil from the Main Reactor Coolant System Pumps being thrown beyond the oil collection system due to a break in the shaft, shaft collar or lower oil pan assembly.

9. Describe the protection and provide a copy of the fire analysis for steam generator PORV controls. Are the Boron Injection Tank, Boron Injection Pumps, Safety Injection Pumps and the automatic actuation of charging pumps included in the Appendix R functional criteria?

10. Describe the effects of a Main Steam Line Break and a resulting steam generator PORV opening spuriously. Describe the environmental qualification of the PORV including seismic. Is the PORV single failure proof? Discuss whether the Appendix R functional criteria specifically called for no blowdown of any steam generator.

11. Provide assurance that the pressurizer block valve will close against full reactor coolant system pressure.

12. Provide an explanation of how Appendix R related cables are provided protection from spurious actuation. In particular define the grounding mechanism of these cables. Do cables of a train for various required components share a common ground. If so, is spurious actuation from a wire to wire short between different cables prevented. Were credible faults considered between individual conductors within a given cable? Cable to cable?

13. Is there base line data to say whether Revision 6 to DNE Calculation SON-SOS4-127, "Equipment Required for Safe Shutdown During Design Basis Fire," has been properly implemented? Was a task force formed to establish the base line for Revision 6? Have audits been conducted to verify that breaker/fuse coordination efforts were conducted properly?

14. Provide the HVAC calculations or damper closure information which show that rooms outside the fire area can stay within equipment qualification limits during a fire. Provide the HVAC calculation showing when containment access can be accomplished following a fire.

15. Provide the fire interaction study for a fire in the immediate vicinity of the pressurizer.

16. Provide a list of guaranteed Appendix R equipment which is required for availability during performance of SDI 26.3.

17. Provide information if available regarding testing or analysis of passing liquid through a pressurizer code safety valve and the resultant erosion and subsequent ability of the valve to reseat.

18. Provide rationale for protection of CCP cavitation from a spurious actuation of the VCT isolation valve. Provide calculations and procedural references for protecting the VCT when static pressure head is lost from the RWST during cool-down and RWST inventory reduction. Discuss spurious actuation of the VCT Hydrogen blanket makeup valve.

19. Provide the basis for fire protection of Appendix R shutdown systems inside the containment.

20. Discuss possibility of two low pressure signals causing an actuation of the safety injection system. Also discuss the protection of circuitry required to assure proper alignment of the safety injection system.

21. Has TVA evaluated the effect of fire on instrument sense lines? Provide the result of the evaluation and its effect on the Functional Analysis Report. Discuss the effect on the safe shutdown analysis due to the fire effects on pressurizer level, steam generator level, and temperature instrumentation.

22. Explain why the fire in containment would not affect the instrumentation (as discussed in the preliminary Task Group Disposition of Issues in B.2) used by the operator to distinguish between a fire and a LOCA.

23. Discuss how Steam Generator overfill from the main feedwater system is protected against following a fire in the control building. In particular address response times for feedwater isolation following loss of the control building.

24. WCAP 10541 provides justification of RCP seal integrity under a station blackout condition where the RCP's would not be running. If TVA has not assured the ability to promptly trip the RCP's during a fire, on what basis do you consider this analysis applicable to Sequoyah. WCAP 10541 provides for no less than 1 hour until failure for non-energized RCP's using high temperature elastomers. It appears this is not true for all elastomers available. Provide information on elastomers installed in Sequoyah's RCP seals.

25. Given that TVA considers the spurious opening of a pressurizer PORV a credible event and relies on the manual closure of the block valve to

    limit the consequences of this event, discuss for a control building fire how long will it take for the operator to take this action. What will the RCS conditions be at the time of PORV isolation? Does SI actuation occur and is it available? What restoration guidelines will be used? What specific operator training and procedures have been provided?

26. Are the narrow range RCS pressure sensors included in the Appendix R analysis and has it been verified that they are sufficiently separated such that the 2 out of 4 logic required to actuate SI would not be jeopardized. Considering that the spurious actuation may lead the operator to think a LOCA is in progress, what other instrumentation may also be affected, i.e., (pressurizer level sensing, sump level sensors, reactor building temperature sensors, wide range RCS pressure sensors, and containment radiation monitors)? What procedures and/or operator training have been developed to aid the operator in distinguishing an actual RCS depressurization from fire induced spurious failures which falsely indicate a LOCA.