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JAN 28 1991

U.S. Nuclear Regulatory Commission
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Gentlemen:

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

SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2 - DEVIATION REQUEST FROM REQUIREMENTS OF 10 CFR 50, APPENDIX R, SECTION III.G.2

- References:
1. TVA letter to NRC dated August 30, 1990, "Sequoyah Nuclear Plant (SQN) Unit 2 - Docket No. 50-328 - Facility Operating License - DPR 79 - Special Report 90-10, Revision 1 - 10 CFR 50, Appendix R"
 2. NRC letter to TVA dated May 29, 1986, "Deviation Requests from Appendix R of 10 CFR Part 50"

TVA is providing a permanent deviation request from the requirements of 10 CFR 50, Appendix R, Section III.G.2, for a small portion of Elevation 690 in the auxiliary building, Column Lines A11 to A13 and Q to R, reported to NRC in Reference 1.

Enclosure 1 contains the deviation request and the justification for the request. Enclosure 2 contains a copy of the fire hazard analysis, which supports the justification. The fire hazard analysis is considered to constitute an engineering analysis performed in accordance with NRC Generic Letter 86-10, Enclosure 1, Item 5, for the subject area. Upon NRC approval of this deviation request, the compensatory measures to perform hourly monitoring in these areas will be discontinued.

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As a result of a fire hazard analysis, it has been determined that the upgrade of the existing configuration to fully meet Section III.G.2 would not result in a measurable increase in afforded protection. There are insufficient combustibles in the area to pose a significant fire hazard to the 1-hour, Underwriters-Laboratories-rated fire wrapped cables. Because the area does not contain the potential for a fire capable of disabling the cables in their existing configuration, it is concluded that the current routing and current 1-hour fire protection are adequate. Additionally, the auxiliary building areas surrounding the subject area are provided with fire detection and automatic fire suppression systems. The subject area is similar to the areas described in an existing NRC-approved SQN Appendix R deviation (Reference 2) in that it is a small area in the auxiliary building without fire detection and automatic fire suppression systems and with a very small amount of combustibles.

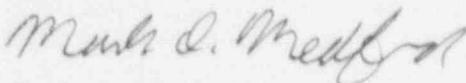
Deviation 12, approved by Reference 2, justified noncompliance with 10 CFR 50, Appendix R, Section III.G.2, where a number of rooms or portions of rooms within the auxiliary building were not provided with fire detection and automatic fire suppression. These areas were shown to contain insignificant levels of combustibles, and a fire within any of these areas would be detected by fire detection equipment in adjacent areas within sufficient time to permit fire brigade response and fire extinguishment prior to damage to redundant shutdown trains. Conditions for the subject area are similar as previously noted and detailed in the enclosed fire hazard analysis. Based upon the existing deviation (Deviation 12) and the results of the fire hazards analysis for the subject area, it is concluded that the fire protection features similarly afford an acceptable level of protection equivalent to that required by Appendix R, Section III.G.2. Accordingly, TVA requests NRC's approval of this permanent deviation.

Enclosure 3 contains an equipment layout of the manual fire suppression equipment in the subject area.

If you have any questions concerning this submittal, please telephone M. A. Cooper at (615) 843-6422.

Very truly yours,

TENNESSEE VALLEY AUTHORITY



Mark O. Medford

Enclosures
cc: See page 3

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ENCLOSURE 1

Deviation Request for the Boric Acid Tank Area of Auxiliary Building Elevation 690

Deviation

10 CFR 50, Appendix R, Section III.G.2, requires safe shutdown components to be separated from each other by one of the following methods:

- a. Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent to that required of the barrier;
- b. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustible or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or
- c. Enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating, [sic] In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area;

Contrary to the requirements of 10 CFR 50, Appendix R, Section III.G.2.c, conduits containing cables required for safe shutdown equipment enclosed in a 1-hour fire barrier are installed in the auxiliary building, Elevation 690, at Column Lines A11 to A13 and Q to R (Enclosure 2, Appendix A), without the required fire detection and suppression. The following cables are affected:

<u>Cable No.</u>	<u>Description</u>	<u>Channel/Train</u>
2PM2080I	Unit 2 - Reactor Coolant System (RCS) Pressure Control	I/A
2PM2087II	Unit 2 - RCS Pressure Control	II/B
2PM2084I	Unit 2 - Secondary Side Pressure Control	I/A
2PM1086III	Unit 2 - RCS Inventory Control	III/A

Deviation Request Justification

The auxiliary building is a designated fire area and is separated from adjacent fire areas by reinforced concrete construction, which is equivalent to a 3-hour-rated barrier. The area in violation is approximately 456 square feet located between Column Lines A11 to A13 and Q to R on Elevation 690 in the area of the boric acid tanks (refer to Sequoyah Updated Final Safety Analysis Report [UFSAR] Figure 1.2.3-5 [Enclosure 3]). Adjacent areas contain both fire detection and automatic fire suppression capabilities. The area has also been shown to contain a very low combustible loading, and the conduits in question are wrapped with a 1-hour fire barrier. The combination of these fire protection features affords an acceptable level of protection equivalent to that required by 10 CFR 50, Appendix R, Section III.G.2.

An analytical fire model calculation, referred to as a fire hazards analysis (FHA) (Enclosure 2), has been performed for the area of the auxiliary building, Elevation 690, at Column Lines A11 to A13 and Q to R, and provides the technical justification for this deviation to the Appendix R requirements. The results of the FHA indicate that an unmitigated fire will not compromise the existing fire wrap on the cables in this area within the first hour of a worst-case fire. Furthermore, the FHA demonstrates that the burn time for the worst-case fire in this area is less than 10 minutes. This area of the auxiliary building is easily accessible for fire fighting personnel. The normal expected TVA onsite fire department response time for the subject area of the plant is less than 15 minutes. Early confirmation of a fire in this area by adjacent area fire detection or by normal personnel ingress and egress in the area, coupled with the low fire load in this area and the accessibility of the area for fire fighting personnel, provides an adequate margin of safety to ensure the required Appendix R equipment will be available for achieving and maintaining safe shutdown.

Cross-zone ionization detectors are contained throughout the general area of the auxiliary building on Elevation 690, and specifically in the adjacent area to the area in question. Accordingly, it is expected that a fire in the subject area would be detected by fire detection equipment in the adjacent areas. The detectors are designed and installed as Class A (currently National Fire Protection Association [NFPA] 72D, Style D) detection systems. As listed in the Sequoyah UFSAR and technical specifications, each of the cross-zone detectors in the general area of the auxiliary building on Elevation 690 is wired as a separate fire detection zone.

Trouble and alarm indications are established for each zone. Any detector within this area that senses smoke will initiate an alarm signal in the main control room. Trouble signals are sent to the detector control panel and to the main control room computer terminal.

Because the detectors are designed and installed to Class A circuit configuration, the detectors will remain operable with a single open circuit or ground fault. Failure of the wiring will result in a trouble signal with the exception of a wire-to-wire short. For the wire-to-wire short, an alarm signal will be sent to the main control room.

In the event that a detector is inoperable in the general auxiliary building area of Elevation 690, a second detector will be available to provide early warning of a fire. In addition, the minimum number of detectors in the general area is governed by technical specifications. If the minimum number of detectors is unavailable, appropriate compensatory measures (i.e., hourly fire watch) prescribed in SQN technical specifications will be administered.

Automatic fire suppression is located throughout the general area of the auxiliary building on Elevation 690, and specifically in the adjacent areas to the area in question; also, seven sprinklers are located in a portion of the subject area. Accordingly, it is expected that some level of suppression would be available to a portion of the area in question and would prevent any spread of a fire in the subject area. The total flow from all the sprinkler heads located in the adjacent areas, which include the seven sprinklers in the area of question, is 826 gallons per minute (gpm). This flow is delivered

to an area of approximately 1,500 square feet. This results in an average actual delivered density of 0.55 gallons per minute (gpm) per square foot. In the area of concern, this delivered density is applied to the cross-hatched area shown on Sheet C3 of Enclosure 2. This exceeds the maximum density required by NFPA 13 for Extra Hazard Group 2 (the most severe classification), which is 0.37 gpm per square foot. The design classification for the area in question is Ordinary Hazard Group 2 and requires 0.16 gpm per square foot for the fire area. Standpipe and hose stations and portable extinguishers are also provided throughout the general area of the auxiliary building on Elevation 690 for use in the boric acid tank area in the event of a fire (Enclosure 3).

The auxiliary building, Elevation 690, at Column Lines A11 to A13 and Q to R, is routinely inspected for transient materials in conjunction with SQN Standard Practice SQA66, "Plant Housekeeping"; although unlikely, any transient combustibles brought into this area would be controlled by SQN Physical Security Instruction (PHYSI) 13, "Fire Protection Program." PHYSI-13 controls transient fire loads throughout the plant, requires that the area in question remains free of transient combustibles unless compensatory measures are taken (i.e., roving or permanent fire watch as required by the plant fire protection engineer), and requires that transient combustibles be removed from the affected area as soon as the activity permits. Therefore, implementation of SQA66 and PHYSI-13 will provide assurance that the area in question remains free of transient combustibles without appropriate compensatory measures.

Conclusion

In summary, the FHA results indicate that a fully adequate fire protection safety margin exists for the cables in the auxiliary building, Elevation 690, at Column Lines A11 to A13 and Q to R. From these results, which are based on conservative assumptions and worst-case postulated fire conditions as stated in the FHA, the analysis concludes that the required Appendix R equipment will be available for achieving and maintaining safe shutdown.

Upgrading the existing 1-hour-rated firewrap on the conduits containing Appendix R related cables to a 3-hour-rated firewrap or installing area fire detection and automatic suppression would bring this area of the plant into full compliance with Section III.G.2; however, these modifications would not result in a measurable increase in afforded protection as demonstrated in the previously discussed FHA.

TVA considers that the cables involved located in the auxiliary building, Elevation 690, at Column Lines A11 to A13 and Q to R, are adequately protected by a 1-hour-rated fire barrier because of low fire loading in the area of concern. Furthermore, adequate detection in the adjacent areas is provided to ensure that any fire in the unprotected area would be detected within sufficient time to permit fire brigade response and fire extinguishment prior to damage of these cables. These fire protection features are considered to afford an acceptable level of protection equivalent to that required by Appendix R, Section III.G.2; therefore, TVA requests approval of the described permanent deviation from 10 CFR 50, Appendix R, Section III.G.2, requirements for the previously described area.

ENCLOSURE 2

FIRE HAZARD ANALYSIS OF UNIT 2 APPENDIX R CABLES IN THE BORIC ACID TANK AREA
ELEV. 690 AUXILIARY BUILDING

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