April 6, 1994

Docket Nos. 50-390 and 50-391

Mr. Oliver D. Kingsley, Jr.
President, TVA Nuclear and
Chief Nuclear Officer
Tennessee Valley Authority
6A Lookout Place, 1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. Kingsley:

SUBJECT: WATTS BAR NUCLEAR PLANT - REQUEST FOR ADDITIONAL INFORMATION (RAI) RELATING TO THE FIRE PROTECTION PROGRAM (TAC M63648)

By letters dated February 5, June 15, August 28, 1992, and September 15, 1993, TVA provided the Watts Bar post-fire safe shutdown associated circuit analysis and the Fire Protection Report. On July 12-13, 1993, the staff met with TVA at the Watts Bar site to further evaluate the associated circuit analysis.

In the September 15, 1993 letter, TVA indicated that it had revised the Watts Bar Fire Protection Report and this document has become the single source document which describes the operations phase of the Watts Bar fire protection program. The staff is basing its overall fire protection program and post-fire safe shutdown review on this and the other documents referenced above. In addition, the staff's review effort will evaluate Watts Bar conduit and cable tray fire barrier assemblies used to separate redundant safe shutdown trains within the same fire area. By letter dated February 10, 1993, TVA submitted its test plans and other requested information pertaining to its conduit fire endurance testing program and on July 9, 1993, TVA provided the results of this program.

Based on our initial review of the above submittals, we have determined that additional information is needed. We are requesting that TVA provide the requested information by May 15, 1994 but will be ready to discuss an alternate target during the next licensing status meeting.

This requirement affects nine or fewer respondents and, there, is not subject to Office of Management and Budget review under P.L. 96-511.

Sincerely,

Original signed by

Peter S. Tam, Sr. Project Manager
Project Directorate II-4
Division of Reactor Projects II-4
Office of Nuclear Reactor Regulation

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Enclosure:
Request for Additional Information

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ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION

WATTS BAR UNIT 1

FIRE PROTECTION PROGRAM

AND

POST-FIRE SAFE SHUTDOWN CAPABILITY

In order to support the staff's review of the Watts Bar Fire protection Program, TVA (the applicant) is requested to provide the following additional information:

Fire Protection Program and Post-Fire Safe Shutdown Capability
(Reference September 15, 1993, Watts Bar Nuclear Plant (WBN) Fire Protection Report)

Fire Protection Program

1. In reviewing Section 4.0, References, it was noted that the appropriate standards referenced by TVA's Watts Bar conduit and cable tray fire endurance were not included. These fire barriers are part of the fire protection features required to protect the plant's capability to achieve and maintain post-fire safe shutdown. Please identify the criteria and standards used and incorporate them into the fire protection report. In addition, the fire protection report should identify the appropriate fire barrier testing and design references along with specifying the performance objectives for these barriers.

2. Combustible control zones is defined in Section 5.0, Definitions. The definition indicates that these are designated locations which are provided in accordance with Appendix R, Section III.G.2 regulations. This term does not appear in Appendix R. Please describe, through an illustration, how these combustible control zones provide the required fire separation of redundant safe shutdown trains.

3. Continuous fire watch as defined in Section 5.0, Definitions, indicates that a trained individual should be in a specified area at all times and that the area should contain no impediment to restrict the movement of the watch. The patrol frequency for a continuous fire watch specified is 15 minutes with a 5 minute margin. In addition, this definition indicates that a specified area for a continuous fire watch is one or more fire zones within one or more fire areas. This definition does not meet the original intent of a continuous fire watch. Please provide your technical basis for using this type of fire watch patrol and identify how a roving fire watch provides the same level of fire safety to that of a fire watch that remains within the specified fire area on a continuous basis. In addition, information is needed regarding the training fire

watches receive. In order to complete the review in this area, an overview of the fire watch training program is needed.

2. Fire watch-roving as defined, requires that a trained individual be in the affected area at specified intervals with a margin of 25 percent. Please provide your technical basis for this 25 percent allowance and how you intend to assure that the fire watch patrol frequency is maintained to the original specified interval without excessive use of extensions.

5. Frequency has been defined in Section 5.0. As part of this definition an extension to the frequency of 1.25 times, as measured from the previous performance, or as measured from the time a specified condition of the frequency is met. Please provide your technical basis for this 25 percent extension and how you intend to assure that the testing/inspection frequency is maintained to the original specified interval without successive extensions in the frequency.

6. It is noted that noncombustible smoke and hot gas seals are utilized. Please provide your criteria for the use of these seals and a typical description of the materials used to construct these seals. In addition, please clarify if these seals are included in a surveillance and test program and provide a description of this program (e.g., frequency of inspection, type of inspections performed).

7. Section 8.2, Modification Controls, indicates that the fire hazards analysis contains an area by area evaluation of the plant to determine the ability of the passive and active fire protection systems to protect against the hazards present in the area. In the fire hazards analysis, the fire resistive ratings of the barriers have been evaluated in order to delineate the necessary fire separation. In reviewing the fire hazards analysis, the safety factors used in the design of your fire barriers could not be identified. For the fire area boundary fire barriers, please provide a typical description of their design and design basis and the fire resistive safety factors used in determining the rating of these barriers.

8. Section 9.1, Fire Brigade Staffing, please provide a description of the type of emergencies that the fire brigade would respond to on the plant site or owner controlled area, their responsibilities at these emergencies, and when involved in an emergency for a period exceeding 1-hour, what provisions are there to assure that manual fire fighting capabilities for the power block can be adequately supported.

9. Section 9.3, Training and Qualifications, Item c., Fire Drills, establishes the criteria for conducting the various types of fire brigade drills (announced and unannounced) annually. However, this section does not specify the drill attendance criteria for individual fire brigade members and leaders. Please describe the attendance criteria that has been established for individual fire brigade members and leaders.

10. Section 9.5, Fire Emergency Procedures and Prefire Plans, indicates that prefire plans are developed to support firefighting activities in safety-

related and safe shutdown areas. Fire emergency preparedness should not be limited to just those areas, consideration should be given to developing fire preplans for those plant areas which may not be safety-related or safe shutdown areas but, if were involved in a fire, could present a direct or indirect fire exposure to plant areas important to plant safety. Please confirm your intentions to expand the scope of the preplans to cover those areas which may present a potential fire hazard to plant areas important to safety.

11. Section 9.5, Fire Emergency Procedures and Prefire Plans, a summary of the information included in the prefire plans was identified. In reviewing this information, it was noted that the prefire plans do not address smoke control. For each specific fire area please provide a description of how you intend to control smoke and establish ventilation to vent smoke from the area of the fire.

12. Section 10.0, Control of Combustibles, indicates that the use and handling of combustible materials such as fire retardant-treated lumber, paper, plastic, and flammable/combustibles gases and liquids are prohibited or controlled in safety-related areas. Please confirm that the areas required to support safe shutdown are covered by this program. In addition, please provide a description of your program and describe the administrative limits placed on transient combustibles for these plant areas.

13. In Section 10.0, Control of Combustibles, the term limited combustible construction is used. This term is not defined in Section 5.0, Definitions. Please provide a definition of this term.

14. In Section 10.0, Control of Combustibles, the term combustible control zones is used. This term is not defined in Section 5.0, Definitions. Please provide a definition of this term. In addition, please describe in detail the locations of these zones in the plant and the basis for how they are used to provide reasonable assurance that a fire will not propagate and jeopardize fire safe shutdown (FSSD) equipment.

15. Section 11.0, Control of Combustibles, indicates that the ignition source permits are reviewed and approved by appropriate plant personnel. Please provide a description of this program and an overview of the approval process.

16. Section 11.0, Control of Combustibles, indicates that fire watches are provided for all ignition source work activities in safety related areas. Please describe this program and confirm that it covers safe shutdown and those areas which could be a direct or indirect fire exposure to plant areas important to safety.

17. Section 12.1, Water Supply, describes the fire protection water supply and fire pump capacity in general terms. This system gets its source of water from the Chickamauga Lake and shares the underground piping used by the raw cooling water system (RCW). It is our understanding that this system is very similar to the system used at your Sequoyah facility. Due to RCW

demands and concerns over microbiologically induced corrosion, Sequoyah has made plans to modify this system and incorporate listed fire pumps, potable water supply and a dedicated underground fire water distribution system. In order to get a better understanding of the Watts Bar system, please provide a detailed comparison between it and the one utilized by your Sequoyah facility. In addition, this discussion should address logic sequence for starting of the fire pumps, fire flow demands on the system, UL listed components, how future RCW demands will be controlled, and inspection and testing of the system.

18. In your submittal dated May 1, 1992, Response to Question 3, you identified how you intend to control microbiologically induced corrosion (MIC) in the fire protection system. In your response to this question, it was indicated that a nonconforming condition was identified that the fire protection system may experience greater than expected corrosion of piping which could lead to unacceptable system performance. Therefore, system test connections were added to the system and periodic system testing is conducted to detect unacceptable degradation in system performance based on the most hydraulically remote areas of the plant. In order to get a better understanding of how MIC control is performed, please describe how the program will control corrosion and detect degradation in the various deadlegs of the standpipe/hose station system piping, the distribution headers to the various sprinkler systems, etc.

19. Section 12.1, Water Supply, indicates that the underground fire main loop is provided to serve both units and sectional isolation valves are provided so that maintenance can be performed. Please clarify if these valves are the indicating type. If they are not, describe how you intend to verify that these valves are maintained in their correct operating position.

20. Section 12.1, Water Supply, indicates that credit is taken for hose/hydrant houses and the associated fire fighting equipment as backup manual fire suppression capability to the intake pumping station and is the primary and backup for the diesel generator buildings conduit interface room. Section 14.7, Fire Hydrants, indicates that these hydrants are required to be operable whenever equipment in the intake pumping station and diesel generator buildings conduit interface room is operable. Generally, hydrants that provide primary or backup protection to safety related or safe shutdown plant areas are provided with fire fighting equipment houses. Please verify that these hydrants and others that may be important to providing protection for areas that are important to plant safety and may be used to protect safety related structures in the event of a exposure fire are provided with fire fighting equipment houses. In addition, please confirm for those hydrants that fit into this category are equipped with equipment houses, identify the type of equipment in these houses, and verify that the equipment in these houses are included in the testing/inspection requirement for these specific hydrants.

21. Section 12.3.2, Fixed Spray Systems with Closed Heads, identifies that these type of systems provide protection for the charcoal type HEPA filter

units, reactor coolant pumps, area of divisional interaction within the containment annulus, and the cable tray penetrations through the turbine/control building wall. These systems provide protection for safety related functions, or assist in mitigating a hazards that can present an exposure to a safety related structure. Please confirm that these systems are or are going to be included in the testing/inspection requirements for water based fire suppressions systems (Section 14.3).

22. Section 12.8, Communications, indicates that adequate radio communications is provided for all areas of the plant that contains equipment that must be manually operated in the event of a fire. In some rooms, such as the RHR heat exchanger room, two-way radio communications may not be adequate. Please identify all areas of the plant where two-radio communications may not be available. In addition, please describe those communications systems that are considered as backup to the two-way radios and how it was determined that these systems would be free of fire damage and available for post-fire safe shutdown and firefighting operations.

23. Section 12.10.1, Walls, Floors and Ceilings, indicates that fire areas are separated by 3-hour equivalent fire barriers. Areas rooms within the fire areas are separated into fire zones that have equivalent 1-hour, 2-hour, or, 3-hour fire barriers. It is not clear if these barriers are actually rated and constructed in the same fashion as the fire test assembly, in context, please clarify what is meant by the term equivalent.

24. Section 12.10.4, Fire Doors states that modifications to fire doors must be performed in accordance wit acceptance criteria approved by a fire protection engineer. Please describe the modification acceptance criteria for fire doors and the technical basis for this criteria.

25. Section 12.10.6.B, Electrical Penetrations, indicates that conduit penetrations generally require only internal seals. Please describe TVA's general criteria for when an internal fire rated seal is to be installed.

26. Section 13.0, Fire Protection System Impairments and Compensatory Measures, indicates that compensatory actions for impairments to fire protection systems or features generally consists of fire watches as defined in the applicable sections of this plan. This section also indicates that alternate measures can be imposed on a case-by-case basis. In order to complete the review in this area, please describe these alternate measures in detail, provide the criteria for establishing one or a combination of these measures, the technical basis which establishes the technical equivalency of these measures to fire watches, and provide some example cases where you would implement these alternate measures.

27. Describe by fire zone/area, what actions you have taken to assure that advertent or inadvertent actuation of water fire suppression systems would not impact the operability of both redundant trains of safety related or safe shutdown equipment or components.

28. Describe how the design of the hydrogen system precludes the potential for a release in safety and safe shutdown related systems. In the event that

a hydrogen leak were to occur, describe what plant design provisions (e.g., excess flow check valves) there are to assure that there is not an accumulation of hydrogen gas in excess of the lower explosive limit.

29. Appendix A, comparison to position D.4.f, indicates that the design of the stairwells in the control building, intake pumping station, and emergency diesel generator building are enclosed and designed to minimize smoke infiltration. Please describe the life safety design features for the various stairwells and how they minimize smoke from infiltrating into them in the event of a plant fire.

30. Appendix A, comparison to position E.2.e, indicates that the flow rate and the pressure of the fire water system with two of the four pumps running will provide 500 gpm for hose streams while flowing water at design capacity to the single largest sprinkler or deluge system protecting safety related areas and simultaneously providing the raw service water system flow requirements. In order to the assess the adequacy of this system, please summarize the flow and pressure requirements for these pumps, the raw service water system flow demands and for each automatic water suppression system protection safety related, safe shutdown and plant areas that can create a fire exposure to safety or safe shutdown related areas of the plant or can cause a plant transient that can challenge reactor safety.

31. Appendix A, comparison to position F.11, Safety Related Pumps, was not addressed. Please describe for each safety related pump area in the plant how Watts Bar conforms with the guidance.

Post-Fire Safe Shutdown Capability

1. Section 2.0, Analysis Methodology, indicates that the potential impact of Type II (spurious actuation) circuits was determined by a system analysis which identified components that, as a result of a spurious operation, could prevent a safe shutdown system from performing its required function or could lead to a significant loss of reactor coolant inventory. Please confirm that your analysis took into the consideration the information presented in NRC Information Notice 92-18. In addition, please summarize the results of this portion of the analysis and any modifications that resulted from this review.

2. The fire hazard analysis is included in Chapter IV. This analysis provides a description for each fire area in the plant, identifies the fire zones (rooms) located within the area, discusses the potential fire loading and protection provided for the fire zone, and identifies deviating conditions. For each fire zone, the analysis indicates if safe shutdown systems are either located in or not located in the zone. However, the potential impact a fire may have on safe shutdown is not discussed. In order to complete the review, a detailed summary of the systems used to achieve hot shutdown and subsequent cold shutdown is requested for each fire zone/area. This detailed summary should also identify the trains used, their separation, the fire protection features provided for the preferred shutdown path, potential manual

operator actions, type of actions, and where in the plant these actions take place. If repairs are needed to get the plant in cold shutdown, a detailed summary of these repairs should be included for each affected fire zone/area. The discussion should also include resources, materials, and equipment needed to implement these repairs.

Fire Protection Surveillance and Testing

1. Section 14.1, Fire Detection (early Warning Fire Detection and Notification Only), Table 14.1 states that there are no early warning fire detection devices provided for a majority of the plant. Understanding the design of your pre-action sprinkler systems, the system deluge valve is opened when the fire detection device (smoke detector) senses a fire condition in the area. This same fire detection device also provides early warning notification to the control room. Using this logic, shouldn't these detectors be Function A detectors since, if the detection system alone were to become inoperable, the deluge valve could be tripped and the suppression system be place in the wet pipe mode? This would affect the early warning capability only and therefore, an hourly fire watch would be recommended. In the event that the suppression system is inoperable and detection is operable, a continuous fire watch would be considered an appropriate compensatory measure for those suppression systems protecting redundant systems or components. Please clarify your position regarding compensatory measures for inoperable early warning detection and inoperable primary (e.g., automatic) suppression capability.

2. Section 14.1, Fire Detection (early Warning Fire Detection and Notification Only), indicates that with any of the required Function A fire detectors in any of the fire zones identified on Table 14.1 inoperable in an inaccessible area, within 8-hours, restore the inoperable detector, or either establish a roving fire watch which patrols the affected area once every 8-hours or monitor the air temperature in the zone once per hour. In order to better understand how a fire within the containment would be detected in a timely manner under these conditions, please provide the technical basis (e.g., temperature threshold and rise above ambient) for your determination that the air temperature monitoring can provide an equivalent level of fire safety to that provided by the fixed fire detection devices.

3. Section 14.2, Water Supply, establishes the actions necessary to assure the site has fire protection water supply and pumping capacity. The action necessary when one or more fire pumps become inoperable consists of establishing a backup pump and in some cases establishing a supplemental water supply. From the information provided in the technical bases for this action statement, it is not clear as to what the flow and pressure characteristics are of the backup pump. Is this capability sufficient to provide water to those fire suppression systems that protect safety related, safe shutdown, and those plant areas which present a fire exposure to plant areas important to safety? In addition, since the fire pumps take suction from the lake, please explain how a backup water supply is established to these pumps. The action statement

indicates that under certain conditions a backup water supply needs to be established within 48-hours, while 7 days is allowed to establish the backup pumping capacity. This appears to be inconsistent with the bases. Please clarify the action statement to make it consistent with the bases statement.

4. Section 14.3, Water Based Fire Suppression, paragraph 14.3.9, indicates that if the automatic actuation capability is inoperable for any of the water based fire suppression systems that no compensatory measures are required. The applicant's position is that the loss of the automatic actuation feature does not prevent the manual actuation of the system. The intended function of these systems is to provide automatic fire suppression control. Unless the system can be reconfigured to perform its intended function, it should be treated as if it were inoperable and the appropriate compensatory measures should be established. Please provide your technical justification for your position.

5. Section 14.4, Carbon Dioxide Suppression Systems, paragraph 14.4.4, indicates that if the automatic actuation capability is inoperable for any of the carbon dioxide suppression systems that no compensatory measures are required. The applicant's position is that the loss of the automatic actuation feature does not prevent the manual actuation of the system. The ability of a gaseous fire suppression system to control a fire is related to prompt detection and actuation. The intended function of these systems is to provide automatic fire suppression control. Since these systems cannot perform their intended function, they should be treated as if they were inoperable and the appropriate compensatory measures should be established. Please provide your technical justification for your position.

6. Throughout the various action statements the applicant specifies a time frame for restoring the operability of certain fire protection features. For example, Section 14.6, Fire Hose Stations/Standpipes, indicates that the inoperable fire hose stations/standpipes shall be restored to an operable status within 14 days. Please, in general terms, describe what actions would be taken if the allowable restoration time was exceeded, both from a compensatory measures and a licensing perspective, to expedite restoring the operability of the degraded fire protection feature and justify continued operation.

7. Section 14.8, Fire-Rated Assemblies (Fire Barriers), these action statements do not appear to be applicable to raceway fire barrier assemblies. Please provide the appropriate clarification to the bases and the applicable action statements to cover these fire-rated assemblies to the staff for review.

8. Throughout the Bases Section for Testing/Inspection Requirements the specified test frequencies are based on industry operating experience. In order to verify that the test frequencies being specified are adequate to identify potential failures or malfunctions in plant fire detection and suppression features, please provide a summary of TVA specific

operating data which justifies the test frequencies specified by testing/inspection requirements.

Conduit and Cable Tray Fire Barrier Assemblies

1. In reviewing your fire test program, it has been noted that it focused on qualifying the fire barrier systems for major raceway components (e.g., conduits, junction boxes, lateral bend boxes) and it did not qualify the transition portions of the raceway system. For example, this program did not test a cable air drop from a conduit to a cable tray or an air drop of cables from one tray to another. Please justify how you intend to ensure that the fire endurance performance of fire barrier system applied to these transition portions of the raceway system is equal to or greater than the fire barrier system applied to the conduit or cable tray.

2. In considering the applicability of Thermo-Lag as a fire raceway fire barrier, seismic analysis of this material is assumed to have been done. In order to determine the acceptability of this analysis additional information is needed. Please provide a summary of your Thermo-Lag seismic analysis, include discussions of the possible scenarios of seismic-induced Thermo-Lag failures which might affect the functionality of cables, cable trays and other components, what design considerations were incorporated to prevent this from occurring and the criteria used in the cable tray analysis design for dead, thermal, seismic and impact loads or combinations thereof.

Alternative Shutdown and Associated Circuits

1. Spurious Actuation of Pressurizer Spray Valves TVA calculation WBN-OSG4-031 "Equipment Required for Safe Shutdown" develops the shutdown logic diagram and identifies equipment required to achieve safe shutdown of the reactor in the event of fire. This calculation also addresses the potential effect of spurious equipment actuation on the plants ability to achieve and maintain safe shutdown conditions.

   With regard to the potential for spurious actuation of the pressurizer spray valves Section 6.3.3 of this document was found to state, "An analysis determined that the pressurizer spray valves could not be prevented from spuriously opening, this would prevent a safe shutdown per Appendix R guidelines. Therefore, the reactor coolant pumps (RCPs) must be stopped for all fires to prevent RCS depressurization (and subsequent SI signal initiation)."

   Appendix G of this calculation (WBN-OSG4-031) documents the TVA resolution of internal audit findings. Apparently in response to the above, Item 4.1.1 of this Appendix states, in part, that RCP trip capability form the main control room and from outside the Control Building must be provided. The TVA response to this finding indicates that since the pressurizer spray valve instrumentation circuits located outside the control building will be protected by fire wrap stopping the RCPs is only required in the event of fire in the Control Building. In

the event of fire in the Control Building, the TVA response states that the RCPs will be tripped from the control room.

With regard to the above, the TVA analysis appears to describe different approaches to preventing spurious pressurizer spray actuation. While WBN-OSG4-031, indicates that the RCPs will be stopped in the event of fire in any area in order to remove the motive force required for pressurizer spray, the TVA response in Appendix G indicates that additional modifications will be performed (i.e., fire wrap) to prevent the spurious opening of the pressurizer spray valves. Please explain this apparent discrepancy and define which approach is correct. Additionally, it should be noted that in accordance with GL 86-10, a manual trip of the reactor is the only operator action typically permitted to be performed prior to evacuation of the control room (see Comment 4).

2. TVA Detailed Design Criteria No. WB-DC-30-13, 10 CFR 50 Appendix R Type I, II, and III Circuits, Revision 3, dated May 13, 1993, Section 3.3 Design Requirements for Potential Type III Circuits (Common Enclosure), paragraph d. of this section of the design criteria states. "For 480 VAC auxiliary power circuits where full coordination between the cable damage curve and the molded-case circuit breaker instantaneous trip curve cannot be attained, UL standard 489, 'Molded-Case Circuit Breakers and Circuit Breaker Enclosures,' can be used to show the downstream cables are adequately protected against short circuits up to the breakers interrupting capability in the instantaneous region of the circuit breaker (reference Table 8.1 of UL 489)."

   UL Standard 489 addresses design specifications for the manufacture of molded-case circuit breakers and circuit-breaker enclosures. Section 8 "Current Carrying Parts" of this standard addresses the capacity of pressure wire connector type fields wiring terminals that are to be supplied with each breaker. Specifically, Table 8.1 provides a listing of acceptable terminal capacities as a function of the size and type of cable. Based on a review of this standard, it is not clear how it was applied to satisfy the thermal capability and ampacity concerns of the common enclosure associated circuit concern. Please provide the technical basis supporting the use of this standard. Additionally, please explain why this standard was used in place of the information available in NFPA 70 (National Electrical Code).

3. TVA document WB-DC-40-51 contains design criteria established by TVA to ensure compliance with the design requirements of Appendix R. Section 7.13.2 of this document states, "For other than high-to-low pressure boundaries, FSSD capabilities shall not be adversely affected by any <u>one</u> (emphasis added) spurious actuation or signal resulting from damage to a power or control circuit from a postulated fire.

   The Watts Bar Fire Protection Report and equipment logic diagrams (Calc WBN-OSG4-031) state that components whose spurious operation could adversely affect the achievement of safe shutdown conditions in the event of fire were evaluated in the same manner as "required" circuits.

From our review thus far, it is our understanding that for each safe shutdown function identified on the logic diagram (FPR Fig. 4-1), equipment whose spurious operation could affect the performance of that function was identified and an appropriate resolution (operator action, modification, etc.) was implemented for each case as necessary.

Section 7.13.2 of the FPR appears to imply that only one spurious operation was considered to occur as a result of fire in any area, regardless of the number of unprotected circuits that may potentially be affected. To illustrate this concern consider the following example: The cooling water flow path to a required piece of equipment consists of two parallel flow paths. Each flow path is equipped with its own block valve. Fire damage (i.e., single hot short) to the control cable of either valve may cause a spurious change in valve position. The cables for both valves are located in the same fire area and their level of separation does not comply with Appendix R Section III.G.2. In this case, if only one flow path was required, was the potential for spurious closure of both valves considered, or was a literal interpretation of the statement in Section 7.13.2 of the FPR applied? That is, was the spurious closure of only one block valve considered or did the analysis consider the potential for spurious closure of both valves?

With regard to the above, please provide the TVA interpretation of the statement contained in Section 7.13.2 of WB-DC-40-51, and a clear description of how this interpretation was applied during the performance of the WBN safe shutdown analysis.

4. From a review of the FPR it appears that several manual operator actions may need to be performed prior to control room evacuation. As stated in Section 3.8.4 of GL 86-10, the only operator action normally credited prior to control room evacuation is a manual trip of the reactor. Any additional actions require a demonstration of the capability of performing such actions. Additionally, assurance would have to be provided that such actions could not be negated by subsequent spurious actuation signals resulting from the postulated fire.

5. Appendix F of TVA calculation WBN-OSG4-031 identifies the High/Low pressure interface valves of concern at WBN. However, neither this document nor the FPR appears to provide a description of how the spurious operation of these components is prevented and/or controlled.

6. From a review of the FPR and TVA calculation WBN-OSG4-031 it appears that certain Unit 2 equipment is credited for use in the event of fire in Unit 1. It is understood that this equipment may include the Unit 2 EDGs, CCS pumps and fire water pumps.

   With regard to the above, please provide a complete listing that identifies all Unit 2 equipment and the Unit 1 Fire Areas for which the use of this equipment may be credited. Additionally, since WBN Unit 2 is not operating, concerns exist with regard to equipment availability and operability. Please address how the operability and availability of this equipment will be assured.

Deviations

1. Deviation 1.1.4, Intervening Combustibles, indicates that the safe shutdown components in the auxiliary building are in compliance with Appendix R, Section III.G.2.b requirements except that intervening combustibles, in the form of cable insulation, is located between the redundant components. To mitigate the potential consequence of an exposure fire from transient combustibles on the floor, floor level sprinklers are installed under the intermediate obstructions in the intervening combustible space for up to a 30 foot wide path between the spacially separated redundant safe shutdown functions. This deviation indicates that the specifics of this criteria is included in Attachment 2. In order to complete the review of the acceptability of this deviation, please provide a copy of Attachment 2 since it appears that this document was inadvertently left out of the submittal. In addition, please provide detailed drawings that identify the location of these intervening zones.

   To provide an equivalent level of fire safety to that required by Appendix R, the applicant is relying strongly on the operability and the adequacy of these auxiliary building enhanced sprinkler systems. In the event that these systems became inoperable, the proposed Testing Inspection Requirements (see Section 14.3.3) would require an hourly fire watch patrol. Based on the potential safe shutdown impact a fire in the overhead cables may have in these intervening zones, it appears, when these systems are inoperable, that the proposed compensatory measure does not address the potential safety significance. Based on the important safety role these systems have, please address how you intend to maintain configuration control over sprinkler head placement in these intervening spaces and how you intend to assure that an equivalent level of fire safety is maintained in the event one of these sprinkler systems becomes inoperable.

2. Deviation 1.2.1, Lack of Total Area Suppression and Detection, Corridor (676.0-A1), the exposed conduits that contain each train of RHR power cables are protected with 1-hour raceway fire barriers. This area has automatic fire detection. According to your evaluation the in-situ combustibles in this area are considered insignificant and transient combustibles are controlled via site implementing instructions. When the plant is in refuel operations, the RHR system is needed to assure decay heat removal. This would make this area of the plant important during these modes of operations. Please summarize any potential additional administrative controls which you may take to assure that combustibles and ignition sources are controlled in plant areas important to maintaining the operation of decay heat removal capability.