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Docket Nos: 50-390
and 50-391

Mr. H. G. Parris
Manager Of Power
Tennessee Valley Authority
500A Chestnut Street, Tower II
Chattanooga, Tennessee 27401

Dear Mr. Parris:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION AND SITE VISIT TO THE WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2 BY THE AUXILIARY SYSTEMS BRANCH

The Auxiliary Systems Branch review of the Final Safety Analysis Report (FSAR) for the Watts Bar Nuclear Plant, Units 1 and 2 has progressed to the point where we have identified certain areas for which additional information is required. The review has included all amendments to the FSAR up to and including Amendment No. 42 and the preliminary version of the Sequoyah - Watts Bar facility comparison.

At this point, we would like to set up a meeting at the site to discuss questions that have been raised as a result of our review. We suggest that the attached request for additional information (Enclosure 1) be used as the agenda for this meeting. Information which will require documentation will be identified during that meeting.

We propose that the meeting be set up no later than mid-August so as to allow any open matters to be closed out in the final SER. Please contact the project manager, T. J. Kenyon, if you d sire any clarification of this matter and to set up the meeting.

Sincerely,

Original signed by
Robert L. Tedesco

Robert L. Tedesco, Assistant Director
for Licensing
Division of Licensing

Enclosure:
As stated

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OFFICE	DL:LB #4	LA:DL:LB #4	DL:LB #4	AD:L:DL			
SURNAME	TJKenyon/hmc	MDuncan	EAdensam	RTedesco			
DATE	8/1/81	8/4/81	8/4/81	8/5/81			

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WATTS BAR

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Enclosure (1)

Auxiliary Systems Branch
Meeting Agenda Items
Watts Bar Nuclear Plant

1. Neither the Watts Bar nor the Sequoyah FSAR provides the following information regarding the South Main Steam Valve Room (MSVR).

   (a) Section 3.2 and 3.5.1.4 of the FSAR does not discuss the South MSVR design regarding seismic and missile protection. Provide the basis for this structure not being designed to withstand the effects due to seismic events or tornado generated missiles.

   (b) Section 3.8.4.1.5 states that the roof of the North MSVR consists of structural steel framing and steel decking, but does not discuss the South MSVR. Figures 3.8.4-47 thru 49 do not show a roof structure. Provide a figure which shows an elevation and plan view of each MSVR which includes the roof structure and/or missile protection grill-work.

2. In Section 9.2.1, it is stated that the ERCW pump motors are weatherproofed and exposed to the atmosphere.

   (a) Describe the environmental effects on the pumps (such as freezing rain, cold temperatures) and what precautions, if any, are required.

   (b) Discuss the tornado missile protection provided (grill or grating) for the ERCW roof structure.

3. Q10.4 and Q10.28 requested information regarding environmental effects on certain external plant features. Your response did not address the

environmental effects (surface freezing) on the ERCW travelling screens. Discuss the effects of the loss of the travelling screens due to the surface freezing of the intake lake, to tornado missiles impacting on the travelling screen drive mechanism, and to freezing rain and ice on the drive mechanism. Discuss why travelling screens were not included in Table 9.2.2.

4. Describe the heat tracing provided the outdoor Condensate Storage Facility and piping (Section 9.2.6).

5. The words "similar" and "momentary" are used frequently (in Table 9.4.7) in describing the "effect on System" portion of the Failure Modes and Effects Analysis for the Control Building HVAC System. We do not know how to interpret these words. Please update Table 9.4.7 using more descriptive terms.

6. Contrary to the statement in Section 9.5.1.2.1 which states the H.P. fire protection system is isolated from the Auxiliary Feedwater System by the use of motor operated flow control valves, Figure 9.5-2 shows isolation accomplished by the use of manual butterfly valves. Please provide an updated Section 9.5.1.2.1 or a Figure 9.5-2 to correct this discrepancy.

7. Your Balance of Plant Comparison between Sequoyah (SQN) and Watts Bar (WBN) states that WBN utilizes the Westinghouse Model D steam generator. Yet Figure 5.5-3 does not show this model. Provide a corrected figure.

8. Concerning Section 10.4.9, "Auxiliary Feedwater System":

   (a) Verify that the Auxiliary Feedwater Pumps will survive the automatic transfer of water sources from the Condensate Storage Tank (CST) to the ERCW. (Previous applications have indicated that pumps can operate without water only for one minute.) The verification should include the consideration that the valve to the CST is inadvertently closed.

   (b) We require all plants receiving operating licenses, including sister plants, to perform a verification test to demonstrate that no damaging water hammer will occur when the Auxiliary Feedwater System (AFWS) is activated. It is our position that you commit to perform a test using the standard plant operating procedures for the AFWS to verify that unacceptable water hammer will not occur.

   (c) It is stated that each motor driven AFW pump and its associated valves are supplied from ESF quality power systems and control air subsystems. Does the word "quality" mean ESF sources, or that these sources are "just as good" as ESF sources? Please provide clarification.

   (d) Provide a response to our March 10, 1980 letter concerning your Auxiliary Feedwater System design.

9. Section 10.3.3, "Main Steam Supply," states that portions of the main steam system are protected from missiles in critical areas. Discuss the types of missiles considered, the protection provided, and the critical areas considered.

10. Concerning the Possible Maximum Flood level (PMF), the following PMF elevations are presented in the FSAR:

    (a) Section 1.2.1.4 - 743.5

    (b) Section 2.4 - 738.1

    (c) Figure 9.2-1 - 737.5

    Please update these references to show the correct figure.

11. Concerning Section 3.5.1.4, "Missiles Generated by Natural Phenomena":

    (a) Table 3.5-9 makes use of the term "missile controlled design." Please define this term.

    (b) By inference from Section 3.2, the Refueling Water Storage Tank (RWST) is not tornado missile protected. Please provide information regarding why the RWST need not be protected from tornado generated missiles.

    (c) Figures 1.2-1 and 1.2-2 shows ventilation fans located over the rooms of the Vital Shutdown Transformers. Describe the means by which these transformers are protected from multiple vertical missiles, as recently discussed for Sequoyah.

    (d) Provide a discussion of how the penetration depths of those missiles listed in your missile spectrum were determined when they impinged onto a CAT I structure. Provide the results of such an analysis and the thickness of the protection medium provided which allowed you to conclude that the missile protection afforded was indeed adequate.

(e) Section 3.5.1.4 states that the Essential Raw Cooling Water (ERCW) pumps are protected from vertical missiles on the intake pumping station. Section 3.5.1.1.5 states that the ERCW pump motors are exposed to the atmosphere. Provide a discussion as to how the ERCW pumps and pump motors are protected from vertical missiles. Provide drawings of the pumphouse and structure which includes a view of the missile protection afforded.

(f) Discuss your criteria and assumptions used in determining the protection needed for underground piping to protect them from the effects of tornado generated missiles.

12. Provide a summary of criteria of Mechanical System Components similar to that of Table 3.2-2 in the Sequoyah FSAR. Include components of the reactor system such as the control rod drive. Also include the seismic category of the components.

13. Table 3.2-1 excludes the RWST as a seismic CAT I structure, yet the RWST is stated in the Sequoyah FSAR as being seismically qualified. Provide a discussion as to why the RWST need not be designed to withstand the effects of a seismic event and the differences between the SQN and WBN RWSTs.

14. It is not explicitly stated in Section 3.4.1 whether the CAT I concrete structures are designed to be watertight to the elevation at which water enters the building's accesses. Verify that exterior walls subjected to floods are waterproofed to flood elevation.

15. Section 3.5.1.1, Table 3.2-1 states that systems and components important to safety located in these structures rely on redundancy and separation for protection from internally generated missiles by failure of high pressure system components. Types of missiles considered to be credible missiles are not identified. Further, systems which have been considered as requiring protection from these missiles, or systems which have been considered potential sources of missiles are not identified nor how protective measures are achieved for components of a typical safety related system. Provide the missing information and discuss the means by which the flight path, orientation, strike zone and penetration were determined. The Auxiliary Feedwater System is considered a suitable example. The analysis should cover the entire system including the turbine and motor driven pumps, pipe routing in the Auxiliary Building and pipe tunnel, junction with its tempering feedwater line and termination at the primary containment. Equipment and piping drawings should illustrate the protection afforded by spacing and separation from adjacent high or moderate energy systems and potential missile sources listed above. The evaluation of this typical system should verify that no damage to safety related equipment will result which would prevent the use of equipment necessary to reach a safe shut down. Be sure to consider missiles which may be generated due to single failure of a component.

16. In Section 3.5.1.2, concerning the protection of safety related systems from internally generated missiles, identify all systems and components which were considered as requiring protection.

17. Table 4.3-1 infers continued use of part length and yet Section 4.2.3, "Reactivity Control Systems," does not mention the use of part length rods. Discuss the use of part length rods in WBN.

18. Concerning Section 5.2.7, "RCPB Leakage Detection Systems":

    (a) Section 11.5 is referenced throughout Section 5.2.7 for detailed descriptions of the air particulate and radiogas monitors. Section 11.5 deals with the Solid Waste System and makes no mention of any monitor of any type. Please provide the intended information or a source within the FSAR where the information can be found.

    (b) From the description of the Containment Radio gas Monitor (p. 5.2-61/62), the determination of the conclusion of being able to detect 1 gpm in approximately 1 hour is unclear. Please discuss.

    (c) Reference Section 5.2.7.1 - For detecting leakage between the two reactor pressure vessel (RPV) "O" ring seals, it is stated that a high temperature annunciator in the Main Control Room (MCR) will alarm upon excessive flow rate. Explain how temperature is a function of flow rate and how temperature is an accurate indication of excessive flow.

    (d) Discuss the method and process used to provide signal calibration and correlation during plant operations as stated in Regulatory Guide 1.45, Position C.8.

19. Concerning Section 9.1.1 - "New Fuel Storage":

    (a) It is unclear whether the New Fuel Storage criticality analysis included the possible presence of spray foam.

(b) This section does not state whether the covers over the new fuel vault are seismic Category I. Please provide the required information to the above.

20. Concerning Section 9.1.2 - "Spent Fuel Storage":

(a) Discuss and verify the maximum potential energy contained in all objects of less weight than a spent fuel assembly plus its handling tool, which can be handled over stored spent fuel, if dropped, will not possess a kinetic energy greater than that of the spent fuel assembly at its normal handling height and will not exceed the effects of the fuel handling accident described in Section 15.4.5 of the FSAR.

(b) It is stated that the Spent Fuel Pool is seismic Category I. However, you do not state whether the pool liner or the pool gates are seismic Category I. Please provide this information.

21. Several items in Table 9.1.1 are in conflict with what is stated in the text. For example, the high density S. F. Racks hold 1312 assemblies or approximately 6 1/3 cores, yet the tables state that the capacity is only 1 2/3 cores. Update Table 9.1.1 accordingly.

22. Concerning Section 9.1.3 "Spent Fuel Pool Cooling"

(a) Since the SF Pool capacity of Watts Bar (WBN) is greater than that of Sequoyah (SQN) provide a response pertinent to WBN of the NRC question asked to SQN, Q9.11 (SQN Amendment 40) in the form similar to that provided for Q9.11. State the imposed delay time before initiating full core unloading into the SF pool following back to back refueling.

(b) Provide the results of the SF pool thermal hydraulic analysis in the form of decay heat load vs time (where time =0 is when the first assembly from a refueling is placed in the SF pool) and SF pool temperature vs. time. Your analysis should provide results for the cases of refueling and full core off-load, one SFC train, two SFC trains and loss of all SFC systems conditions.

(c) Describe the means of detecting and monitoring leakage from the SF pool assuming a breach in the SF pool liner/weld crack.

(d) Section 9.1.3.4 states that the active components of the SFPCCS are either in continuous or intermittent use during normal plant operations. Discuss whether this statement includes the periodic operability testing performed on the components associated with the spare SFC pump C-S which is not in continuous use.

(e) Calculations indicate that SF pool heat-up rate for the case of a full core discharge w/loss of SF cooling of 83.1 °F/hr as stated in Section 9.1.3.3.3 may possibly be in error by approximately one order of magnitude. Verify this discrepancy and provide the time before pool boiling occurs assuming that the pool is filled with spent fuel including a refuel load and full core discharge.

(f) This FSAR indicates that for flood mode operations during a refueling, cooling will be accomplished via the use of the SFC pumps. Since these pumps are located at elevation 737, describe how this will be accomplished when flood waters reach the DBF elevation of 738.1.

23. Concerning Section 9.1.4 - Fuel Handling System"

(a) Section 9.1.4.2.2 implies that the New Fuel Elevator is in the SF Pool while Figure 9.1-3 shows the elevator to be in the transfer canal. Please provide clarification.

(b) Discuss how the fuel handling equipment (manipulator crane/refueling Bridge, spent fuel bridge and fuel transfer equipment) compares with design requirements for fuel handling systems of section 6, ANS-57.1 (1980).

24. The response to Q10.6 is incomplete in that the travel path for the SF cask or other heavy loads has not been diagrammatically provided. Discuss whether the fuel handling floor can withstand a SF cask drop from its maximum handling height. If the floor cannot withstand the drop, provide a list of all safety related equipment that would be affected by the effects of the drop.

25. Contrary to the statement in Section 9.1.4.3.2, the safety classifications of the fuel handling system components are not listed in table 3.2-1. Please provide the missing information.

26. Subsection 9.1.4.2.1 - "refueling procedures" does not include "Phase V" - SF Cask Loading as was provided for Sequoyah. Include the procedure in the Watts Bar FSAR and note the differences between the two plant procedures.

27. Figure 1.2-4 shows two Component Cooling Booster pumps and two Thermal Barrier Booster pumps. Is the terminology interchangeable?

28. The Component Cooling pump capacity of 6000 gpm each (table 9.2-8) and the required flow rate for units 1 & 2 under normal operating conditions of 14828 gpm seem to conflict with section 9.2.2.4 which states that Trains 1a and 2a equipment will provide all the cooling water necessary for the safe operations of unit 1 and 2 respectively (i.e., two pumps). Provide clarification for this apparent discrepancy.

29. The Component Cooling Booster pumps/Thermal Barrier Booster pumps, though located below the DBF level, are not listed on table Q10.1-1 as being floodable. Describe the flood protection afforded these pumps.

30. Please provide a response to Q10.31 concerning the loss of Component Cooling water and its effects on the Reactor Coolant Pump bearings oil cooling capability.

31. Describe the considerations and provisions made in the design of the Equipment and Floor Drainage system (section 9.3.3) to ensure that excess fluid due to flooding other than the PMF is collected and dispelled in order to ascertain the operability of the safety-related components. Indicate what operator action, if any, and within what time interval it is required. Indicate whether the response to Sequoyah Q9.20 is applicable for Watts Bar.

32. Verify your commitment to perform and implement the interim actions for control of heavy loads as outlined in Enclosure 2 of the December 22, 1980 letter addressing the concerns for Control of Heavy Loads at Nuclear Power Plants, NUREG-0612.

33. Section 3.6A - Concerning the plant design for protection against postulated piping failures in fluid systems outside containment. Revision 2 to REPORT #72-22 indicates that the evaluation performed for the Sequoyah facility is applicable to Watts Bar, yet the TVA prepared balance of plant comparison states that the designs at Sequoyah and Watts Bar are different. Provide an updated piping failure analysis for Watts Bar in a fashion similar to the above mentioned report. Include all high and moderate energy piping systems in your analysis, and describe where applicable, the differences between the Watts Bar and Sequoyah facilities.

34. Section 3.5.1.4 - Tornado Missile Spectrum B states that "missiles B1, B2, and B3 were considered in the design of the doors. Additional protection is provided for missiles B4, B5 and B6." From the text in Section 3.8.4, the "additional protection" is provided by the precast concrete bulkheads. It is further stated that the concrete bulkheads were designed to resist a new missile spectrum. Provide this missile spectrum and verify that it is consistent with your "Spectrum C", or justify the use of two different missile spectrums for the same Category I structure.