Docket

JAN 2 5 1974

Docket Nos. 50-438
and 50-439

Tennessee Valley Authority
ATTN: Mr. James E. Watson
Manager of Power
818 Power Building
Chattanooga, Tennessee 37401

Gentlemen:

In order that we may continue our review of your application for a license to construct the Bellefonte Nuclear Plant, Units 1 and 2, additional information is required. The information requested is described in the enclosure and pertains to Chapters 3, 9 and 10 of the Preliminary Safety Analysis Report.

In order to maintain our licensing review schedule, we will need a completely adequate response to all enclosed requests by February 25, 1974. Please inform us within 7 days after receipt of this letter of your confirmation of the schedule date or the date you will be able to meet. If you cannot meet our specified date or if your reply is not fully responsive to our request, it is highly likely that the overall schedule for completing the licensing review for the project will have to be extended. Since reassignment of the staff's efforts will require completion of the new assignment prior to returning to this project, the extension will most likely be greater than the delay in your response.

Please contact us if you have any questions regarding the information requested.

Sincerely,

/S/

A. Schwencer, Chief
Light Water Reactors Br. 2-3
Directorate of Licensing

Enclosure:
Request for Additional Information

cc: See Next Page

LB

OFFICE ➤						
SURNAME ➤						
DATE ➤						

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SURNAME ➤	DKDavis:kmf	ASchwencer				
DATE ➤	1/24/74	1/25/74				

JAN 2 5 1974

REQUEST FOR ADDITIONAL INFORMATION
TENNESSEE VALLEY AUTHORITY
BELLEFONTE NUCLEAR PLANT, UNITS 1 & 2
DOCKET NOS. 50-438 AND 50-439

3.0 DESIGN OF STRUCTURES, COMPONENTS, EQUIPMENT AND SYSTEMS

The response to Request 3.67 is inadequate. In order to enable us to complete our review, provide the following additional information:

(a) It appears that a number of expressions shown in the PSAR are incompatible with regard to dimensional analyses. Therefore, describe the basis and assumptions used to establish the equations (1) through (17).

(b) The velocities and accelerations of the missiles have been expressed in a form of relative quantities with respect to the wind field. In terms of the applicable relative velocity and acceleration components, provide the expression of the maximum height attained by the missile, the maximum horizontal velocity attained by the missile and the peak velocity of the missile attained during flight.

9.0 AUXILIARY SYSTEMS

9.55 In your response to Request 9.23, regarding the effects on the separating wall and the fuel pool in the event that a cask is dropped in the tipped position, it is stated that the crane will be moving at a very slow rate and if a cable should break over the cask loading area, the cask will be tipped in the north-south direction. However, an examination of Figures 9.1-4 and 9.1-5 indicates that the top of the 150 ton overhead crane rail overlaps the spent fuel pool area. Thus taking this into consideration in conjunction with the velocity vector of the cask, it appears that the possibility of a cask falling into the fuel pool may not be as remote as it has been suggested.

It is requested that you provide either a modification of the rail arrangement or an analysis indicating the velocity, momentum and the resultant external forces of the cask to support the conclusions you have reached.

9.56 The responses to Requests 9.24 and 9.25 are inadequate. To assist in an evaluation of the adequacy of the system, provide the following information:

(a) Discuss the mathematical model used to calculate the heat transfer between the spent fuel and the pool water.

(b) Discuss the method of calculating $T_{in\ SF}$ and clarify whether this is the bulk temperature of the pool water.

(c) The PSAR indicates that the system is provided with interconnections to the Decay Heat Removal System (DHRS) which is described as a supplementary cooling source for the spent fuel pool. The Regulatory staff's position is that, except for refueling, the DHRS may not be initiated to supplement the Spent Fuel Cooling System of the corresponding nuclear power plant unless the reactor is not loaded with nuclear fuel. Further, locked valves must be provided to prevent the initiation of the corresponding DHRS for spent fuel pool cooling purpose while the reactor is loaded with nuclear fuel. Therefore, you are requested to clarify the system design intent and provide a description detailing the operational procedure and limitations.

(d) List all the equipment or components for the spent fuel cooling system which are designed to seismic Category I criteria. In addition, provide a single failure analyses to demonstrate the adequacy of the system under either normal or accident mode operation.

9.57 In regard to Section 9.2 5, Ultimate Heat Sink, provide the following information:

(a) The integrated heat released due to heavy elements and fission product decay as given in your response to Request 9.30 over a time interval of 1.5 x 10' to 3.33 x 10^6 seconds appears to be non-conservative. Discuss the basis and assumptions used to calculate the total integrated decay heat.

(b) Varify the design adequacy of the Essential Raw Cooling Water (ERCW) System based on the time history of heat loads and the environmental parameters. The environmental conditions to be used for the analysis should be for a hypothetical 30-day period. Meteorological data from the historical period of record in the region should be used to identify appropriate maximum and minimum parameters for the 30-day period and may be formulated in the following manner:

(i) The first 24-hour period after the postulated LOCA should be represented by the actual temperatures from the "worst-day-of-record" for the conditions being investigated. The maximum heat load should be assumed to coincide with the minimum heat dissipation conditions, or maximum evaporative conditions, as applicable.

(ii) Temperatures for the following 29 days could be represented by the average daily conditions for the "worst-month-of-record" for the condition being investigated.

9.58 The PSAR states that the auxiliary building air-conditioning, heating, cooling, ventilating and air cleanup systems are designed to maintain an acceptable building environment for plant equipment and control, and limit the release of radioactivity to the atmosphere. Certain areas in the auxiliary building are considered to be essential for plant safety during either normal or accident mode operation, and hence must be designed to satisfy safety and seismic criteria. The areas such as the safety equipment rooms which are essential for safe plant shutdown operation and the spent fuel handling areas are under the domination of this system. Therefore, it is requested that you provide the following information:

(a) Tabulate the seismic and safety design criteria for the ESF ventilation subsystems including equipment, components and ductwork, etc.

(b) Discuss the conformance of the system with the intent of Regulatory Guides 1.13 and 1.29, particularly for the portion of the system exhausting to the atmosphere.

9.59 Recent operating experience indicates diesel engine operation and performance is affected by oxygen content of combustion air. Reduction of oxygen in intake air caused by sudden meteorological changes or accidental discharges of noxious gases (or diesel exhaust) in the vicinity of air intakes has degraded (and in some instances curtailed) performance of the diesel generating plant. In regard to the diesel engine combustion air intake and exhaust systems, discuss the precautionary measures taken to obtain assurance that the oxygen content of the incoming combustion air will not under any meteorological and accident conditions be reduced to an extent as to prevent the diesel from developing full rated power. Include in the discussion the potential of fire extinguishing (gaseous) medium or noxious gases being drawn into the combustion air system of one or all diesel generators, thereby degrading their performance or possibly result in loss of emergency generators and loss of emergency power supply. The analysis should also include: (1) a plot of the CO_2 concentration at the diesel-generator air intake vs time caused by the actuation of the CO_2 fire extinguishing system; (2) a plot of the CO_2 concentration at the diesel-generator air intake vs time caused by a large fire at the fuel oil storage tank. Use a spectrum of meteorological conditions including the five percentile and indicate the distances of each event to the diesel air intakes stating all of your assumptions. Where applicable reference the information provided in the response to Request 8.10.

10.0 STEAM AND POWER CONVERSION SYSTEM

10.10 In regard to Section 10.4.7.4, Auxiliary Feedwater, provide the following information:

(a) Your response to Request 10.9.1 contradicts Figure 10.4-8 of the PSAR. The auxiliary feedwater flow diagram indicates a common header connecting the two motor driven auxiliary feedwater pumps with two manually operated and locked open isolation valves. Further, the motor operated flow control valves and the level control valves are supposed to "fail open"; therefore, provide a description detailing the system aligning procedure particularly with reference to such incidents as control valves being closed inadvertantly, to ensure the supply of cooling water to the steam generator and the time interval required to accomplish the procedure.

(b) According to TVA's letter dated December 14, 1973, you intend to uprate the core power level from 3,413 MW_t to 3,600 MW_t, therefore, provide a list of design parameters for the system that must be re-defined in order to accommodate the higher power level.

(c) To justify the adequacy of the required auxiliary feedwater pump capacity, provide the mathematical model for accident mode operation and results of the analysis in terms of the heat transfer parameters.

(d) Provide and discuss the correlation of the relative inventory in the steam generator in terms of the heat transfer parameters, feedwater flow rate and time interval after the accident.

(e) Assuming a 90°F feedwater temperature, calculate the parameters listed in Item (c) above and plot a curve to show their relationship against time over the interval of 130 minutes. In providing the information requested in Item (c) and (d), consider each of the following failure modes: (1) a steam generator main steam line break accident (inside containment) or (2) a steam generator feedwater line break (inside containment) accident plus a single active failure in the auxiliary feedwater system.