November 4, 1985

Dockets Nos. 50-277
and 50-278

Mr. Edward G. Bauer, Jr.
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Dear Mr. Bauer:

SUBJECT: SECOND ROUND OF QUESTIONS CONCERNING THE PROPOSED PEACH BOTTOM MODIFIED SPENT FUEL STORAGE RACKS

Re: Peach Bottom Atomic Power Station, Units 2 and 3.

On September 5, 1985, the NRC staff requested responses to certain questions raised in its review of your August 1, 1985 submittal concerning the approval of new spent fuel storage racks. By letter dated October 9, 1985, you responded to this request. As part of our ongoing review, we find need to request additional responses to questions which were not raised by the staff and conveyed to you in its September 5, 1985 letter. These additional questions are contained in Enclosure 1.

Please review the enclosed request for additional information in Enclosure 1 and provide your responses no later than December 6 so that we may continue our review toward your requested target approval date of January 1986.

In order to complete the record of this subject, Enclosure 2 provides a list of questions conveyed to you previously by the NRC staff in its ongoing discussions with the Philadelphia Electric Company (PECo) staff. Your October 9, 1985 submittal responded to the staff's concerns in Enclosure 2 and, therefore, we require no additional responses to these questions.

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

Sincerely,
Original signed by
JOHN F. STOLZ

John F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

Enclosures:
Enclosure 1 - Request for Additional Information
Enclosure 2 - Request for Additional Information
(no response required)

cc w/enclosures:
See next page

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Units 2 and 3

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REQUEST FOR ADDITIONAL INFORMATION
PEACH BOTTOM UNITS 2 AND 3
SPENT FUEL POOL STORAGE CAPACITY EXPANSION

1. In your submittal, dated August 1, 1985, you stated that the end sections and diffusers of the spent fuel pool cooling discharge piping will be removed to provide additional floor space for new storage racks. Provide the results of your analytical calculations which show that no adverse effect on system operations will occur.

2. Your submittals of June 13, 1985 and August 1, 1985 refer to using the three heat exchangers in the spent fuel pool cooling and cleanup system (SFPC&CS) to maintain pool outlet temperature below 150°F in conjunction with residual heat removal system (RHRS), if necessary, to remove the decay heat associated with a core off-load and the remaining capacity filled with normal refuelings. The FSAR does not discuss the potential for using the RHRS to cool spent fuel. Provide an updated FSAR description which shows the RHR connections.

3. The submittals state that the heat load resulting from the presence of 3819 spent fuel assemblies is within the capabilities of the existing cooling system to maintain pool bulk temperature at or below a design basis temperature of 150°F.

   Provide your basis for exceeding the Standard Review Plan (NUREG-0800) guidance for maintaining the spent fuel pool water temperature less than 140 degrees F with the normal heat load and the single failure of one spent fuel pool cooling system train.

4. UFSAR Tables 10.5.1 states the following:

   a. Design duty/heat exchanger: 3.75×10^6 BTU/hr
   b. Design heat load : 11.25×10^6 BTU/hr
   c. Maximum heat load : 20.6×10^6 BTU/hr at 115°F

   Whereas, a submittal dated August 1, 1985, Tables 3-3 states the following:

   a. Heat exchanger capability, one exchanger in service: 3.76×10^6 BTU/hr
   b. Heat exchanger capability, three exchangers in service: 11.28×10^6 BTU/hr
   c. Maximum pool heat load to insure exit temperature is below 150°F: 26×10^6 BTU/hr for three exchangers in service

   Please clarify the apparent conflict in your submittal, dated August 1, 1985, and provide correct heat load data in updated tables and also provide revised reanalysis of the SFPC&CS design as affected by above conflicting information.

5. UFSAR Table 10.3.1 identifies eleven (11) available makeup water sources to the spent fuel pool. Whereas UFSAR Figure 10.5.1 indicates only one (1) makeup source as the condensate storage tank. If Table 10.3.1 is correct, then provide a discussion of these connections in terms of physical piping tie-ins, valving arrangement, and operating procedures. Also, provide the updated drawings to reflect above information.

6. The updated FSAR provides the reduced size limited figures to identify the flow path and piping data for the fuel pool cooling. Provide legible full or half size drawings for the piping and instrumentation diagrams (P&IDs) and process flow diagrams for the SFPC&CS, service water system, emergency service water system and other interface systems, as applicable, for staff's review in relation to fuel pool cooling capability.

PHILADELPHIA ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 & 3

Request for Additional Information regarding
the Proposed High Density Spent Fuel Rack Installation.

The following questions all pertain to the Licensee's report "Spent Fuel Storage Capacity Modification Safety Analysis Report," submitted August 1, 1985.

1. Figures 4-4 and 4-5 of the Licensee's submittal show the arrangement to be used for high density fuel rack modules. However, neither the figures nor the text provides the values of the clearance space between adjacent rack modules, and between the rack modules and pool walls. Please provide the value of all rack clearances.

2. Section 4.3 of the Licensee's submittal confirms that the OBE and SSE earthquake accelerations were in accordance with those provided in the updated FSAR. However, no information was provided to indicate how the earthquake time-histories in two orthogonal horizontal directions were obtained. Please describe how this was done, and how the resulting orthogonal acceleration time-histories were oriented relative to the long and short dimensions of rectangular fuel rack modules.

3. A statement on Page 4-9 indicates that the analysis included sloshing among the effects of water in the pool. However, sloshing appears to be neglected in the detailed analysis of the spent fuel rack modules and the pool structure. How was sloshing considered?

4. If impact damping between the fuel assembly and the rack cell was included in the analysis, please provide the value of the damping used and the justification for that value.

5. A statement on Page 4-13 indicates that "the hydrodynamic mass of a submerged fuel rack assembly is modeled by general mass matrix elements connected between the cell and the pool wall." Please provide the theoretical premise by which this is modeled.

6. The Licensee indicated the use of 3-dimensional non-linear dynamic displacement analysis of rack modules.

   a. Provide information to assure that the analysis methods provided the resolution of all 3-dimensional dynamic displacements to the extent that any further superposition of results is unnecessary to satisfy the requirements of the NRC's OT position paper.

   b. Provide documentation to assure that the integration of the dynamic, non-linear, 3-dimensional problem was both stable and fully converged for the solutions reached.

7. The Licensee summarized the non-linear displacement analysis of the fuel rack modules with a statement on Page 4-23 to the effect that the maximum fuel rack sliding during an SSE event is 0.0098 inches, and that this value combined with rack structural and thermal displacements, is less than the clearance provided. Additional information should be given to assure that all aspects were considered adequately. Accordingly, please provide the following:

   a. What fuel rack modules were analyzed?

   b. Was the earthquake acceleration oriented in the direction of the short rack dimension? (See Question 2.)

   c. Did any mounting foot of any rack lift off the pool floor? If so, by how much?

   d. In addition to sliding, provide values of the maximum displacements at the top corners of the rack modules considering all contributors to displacement?

   e. How was the clearance space between two adjacent racks apportioned for comparison to the maximum rack displacement?

   f. Did the dynamic rack displacement analysis provide for two adjacent racks to have out-of-phase movement?

8. On Page 4-23 of the submittal, the Licensee states that "the energy which produces lift-off was applied to the fuel rack module -----." Please identify what energy was applied and describe the nature and methods of the analysis.