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L-01-149

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Subject: Beaver Valley Power Station, Unit No. 1 and No. 2
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
Response to a Request for Additional Information
In Support of License Amendment Request Nos. 281 and 152

This letter provides the FirstEnergy Nuclear Operating Company (FENOC) response to a NRC Request for Additional Information (RAI), dated December 4, 2001, pertaining to FENOC letter L-01-113, dated October 29, 2001. FENOC letter L-01-113 submitted License Amendment Requests (LARs) Nos. 281 and 152 that proposed changes to the technical specifications (TSs) to revise the TS 3.9.3, "Refueling Operations – Decay Time," decay time of 150 hours to 100 hours for Beaver Valley Power Station (BVPS), Unit Nos. 1 and 2, respectively. The information provided by this letter consists of the following:

- additional clarification regarding the use of service water for spent fuel pool (SFP) makeup,
- administrative controls to ensure adequate system performance when entering a planned offload,
- further discussion of operational situations addressed in the unit-specific Updated Final Safety Analysis Reports, and
- personnel accessibility to areas in and around the SFP concurrent with elevated SFP temperatures.

The FENOC responses to the RAI are provided in Attachment A of this letter.

FENOC requests NRC approval of License Amendment Request No. 152, as a minimum, prior to the upcoming Unit 2 refueling outage (2R09) scheduled to commence on February 1, 2001.

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FENOC requests NRC approval of License Amendment Request No. 152, as a minimum, prior to the upcoming Unit 2 refueling outage (2R09) scheduled to commence on February 1, 2001.

This information does not change the evaluations or conclusions presented in FENOC letter L-01-113. If there are any questions concerning this matter, please contact Mr. Thomas S. Cosgrove, Manager Regulatory Affairs, at 724-682-5203.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 17, 2001.

Sincerely,

Lew W. Myers

Attachment

c: Mr. L. J. Burkhart, Project Manager
Mr. D. M. Kern, Sr. Resident Inspector
Mr. H. J. Miller, NRC Region I Administrator
Mr. D. A. Allard, Director BRP/DEP
Mr. L. E. Ryan (BRP/DEP)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (RAI) CHANGE TO TECHNICAL SPECIFICATION 3/4.9.3 DECAY TIME FOR BEAVER VALLEY POWER STATION UNIT NOS. 1 AND 2 DATED DECEMBER 4, 2001 (LICENSE AMENDMENT REQUEST [LAR] NOS. 281 and 152)

NRC RAI Question 1

Section 9.1.3.2 of the Unit 2 [Updated Final Safety Analysis Report] UFSAR states that the emergency makeup water supply to the spent fuel pool (SFP) is the service water system via Seismic Category 1 piping. In the table in your submittal showing the SFP makeup system flow rates, the flow rate for service water is "neglected" and the "Time Required to Place In-Service" is "N/A." This implies that the service water system is not a viable source of makeup water to the SFP. Additionally, in UFSAR Section 9.1.3.3, "Safety Evaluation," you take credit for the service water system as the Seismic Category I source of makeup water to the SFP in the event of the loss of fuel pool cooling. Please explain the apparent differences between the Unit 2 UFSAR and your submittal. Additionally, the Unit 2 UFSAR states that to provide service water makeup to the SFP requires the manual operation of several locked shut valves. Will the higher ambient room temperatures due to the higher SFP temperatures affect the ability of operators to perform the actions required to supply the SFP with makeup water?

FENOC Response

The discussion in question relates specifically to providing makeup to the SFP under the abnormal off-load worst case boil-off scenario. This worst case scenario includes the highly unlikely assumption that all forced cooling to the pool is lost at the instant the SFP bulk coolant temperature is at its highest, which results in a minimum time-to-boil (TTB) of 2.58 hours for Beaver Valley Power Station (BVPS), Unit No. 2. FENOC viewed the omission of the service water system (SWS) performance data from the discussion in question as a conservative approach when substantiating adequate makeup capabilities for the minimum TTB scenario and associated coolant boil-off rates because it would take significantly more time to align SWS than to align the other available systems identified in the table. That is not to imply that the Seismic Category 1 SWS cannot be aligned for all SFP loss of cooling scenarios. The alignment of the Unit 2 SWS can be completed in an expeditious manner to mitigate SFP heatup when required. Additionally, the service water system can provide significantly more makeup flow (300 to 400 gpm) than the other identified makeup systems when aligned to the SFP.

The realignment of the SWS to the SFP is performed from the valve pit area. The environment of the SFP does not communicate with the valve pit and the environment in the area would not be adversely affected due to a heatup of the SFP. Therefore, higher ambient temperatures due to heatup of the SFP would not affect the ability of personnel to perform the actions required to supply the SFP with makeup water from the SWS.

In more realistic loss of SFP cooling events (e.g., the SFP cooling system and pumps are not subjected to common cause or common mode failures) there would be ample time to align the SWS and other available makeup systems to the SFP while trouble shooting the loss of a train of SFP cooling to preclude SFP heatup. Procedures and equipment are in place to align the SWS

to the SFP when necessary. It should also be noted that the SWS is supplied from river water making it the least desirable makeup water source for use in the SFP. The statements contained in the BVPS Unit No. 2 UFSAR, Sections 9.1.3.2 and 9.1.3.3, remain valid.

NRC RAI Question 2

What administrative controls are in place to preclude you from entering a planned offload with a worst case single failure of the SFP cooling system?

FENOC Response

The SFP thermal performance analyses and the proposed method of determining decay time based on CCW inlet temperature that support LAR Nos. 281 and 152 incorporated the worst case single failure of the SFP cooling system. These analyses demonstrate that entering a planned offload with a worst case single failure would be acceptable. FENOC ensures that entering a planned offload with a worst case single failure of the SFP cooling system is avoided through shutdown risk and outage risk management efforts, which incorporate risk insights and information into outage planning and scheduling efforts; existing maintenance programs and practices; and procedures addressing refueling prerequisites. Thus, no additional administrative controls would be required to preclude such an offload condition.

Additionally, the BVPS fully acknowledges and appreciates the need for optimum SFP cooling performance during the refueling outage to ensure that the licensing basis SFP temperature limits are not violated. Maintaining SFP temperatures as low as possible is an important objective during refueling outage activities in order to protect personnel safety, plant equipment, and to prevent economic inefficiencies.

NRC RAI Question 3

The safety evaluation in Section 9.5.3.1, "Operational Situations - Spent Fuel Pool Water Temperature Increase," of the Unit 1 UFSAR discusses providing emergency cooling water to the SFP heat exchangers in the case of a loss of component cooling water. The source of the emergency cooling water is the fire protection system. The evaluation also discusses the installation of a temporary hoses [sic] and pump in the case of a pipe failure or loss of both pumps. What is the impact of the proposed reduction in decay time on these evaluations?

FENOC Response

The discussion related to the installation of a temporary pump and hoses in the case of a pipe failure is provided for additional defense-in-depth and was not relied upon in the analyses of SFP systems. The associated analyses, which evaluate performance under this condition, have not been re-evaluated for the proposed reduction in decay time. It would be expected that an increase in the resulting pool temperatures would result and be consistent with that observed in

the design basis calculations. In the design basis calculations, the maximum pool temperature increase is less than 10 °F due to the proposed reduction in decay time.

The retention of this discussion in the UFSAR appears to be a hold over from questions and answers (Q&A) developed to show defense-in-depth during the initial FSAR review and approval process. The fuel pool cooling system is designed with redundant components and the evaluations demonstrate that with consideration of a single active failure, the design basis temperatures for the pool and cooling systems can be met. The subject evaluation considers a loss of all component cooling water, which is an event beyond the design basis. Furthermore, the system alignment described in the discussion was not incorporated to form the basis for the safety evaluation presented for the SFP cooling system. As such, the quantitative results from this evaluation are not required to be contained in the UFSAR.

The UFSAR discussion of this method of cooling will be retained as it provides discussion of additional defense-in-depth. However, since the subject system alignment is not part of the design basis and does not form the basis for the system safety evaluation, there are no plans to update the quantitative analytical results and the discussion of these results will be removed from the UFSAR during a future update.

NRC RAI Question 4

Part of the design basis for the SFP cooling systems as described in the Unit 1 and Unit 2 UFSARs is to permit the unrestricted access to the working area both in and around the SFP. What impact, if any, is there on the ability of operators to access the working areas around the SFP due to the increased SFP temperatures described in your submittal?

FENOC Response

Historically, the SFP temperatures remain low (80 °F to 95 °F range) and rarely exceeds 120 °F during refueling activities. A maximum temperature was experienced during a refueling outage of approximately 123 °F. During increasing temperature transients, procedural actions would be taken to restore the SFP temperature to a normal range in an expeditious manner.

The scenario wherein the worst case single failure is not mitigated and SFP temperatures continued to increase to the maximum projected temperature is highly unlikely. However, prudent actions and measures would be taken to address this scenario. In responding to the occurrence: normal activities in the area would be suspended, non-essential personnel would be prohibited from the area, and actions would be taken to identify the cause of the condition and to mitigate the temperature increase. Personnel required to be in the area would utilize appropriate personal protection equipment (PPE) for coping with high-temperature/high-humidity environments. Efforts would also be made to minimize personnel exposure time to the environment.

Again, as discussed in response to Question Number 2 above, 1) BVPS fully acknowledges and appreciates the need for optimum SFP cooling performance during the refueling outage to

ensure that the licensing basis SFP temperature limits are not violated, and that 2) maintaining SFP temperatures as low as possible is an important objective during refueling outage activities in order to protect personnel safety, plant equipment, and to prevent economic inefficiencies.