

**Paul A. Harden**  
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Fax: 724-643-8069October 7, 2010  
L-10-282

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

## SUBJECT:

Beaver Valley Power Station, Unit No. 2  
Docket No. 50-412, License No. NPF-73Supplemental Response to Request for Additional Information Related to Beaver Valley Power Station Unit No. 2 Spent Fuel Pool Rerack License Amendment Request (TAC No. ME1079)

By letter dated April 9, 2009 (Reference 1), and as supplemented by letters dated June 15, 2009 (Reference 2), January 18, 2010 (Reference 3), March 18, 2010 (Reference 4), May 3, 2010 (Reference 5), May 21, 2010 (Reference 6), and June 1, 2010 (Reference 7), FirstEnergy Nuclear Operating Company (FENOC) requested an amendment to the operating license for Beaver Valley Power Station (BVPS) Unit No. 2. The proposed amendment would revise the Technical Specifications to support the installation of high density fuel storage racks in the BVPS Unit No. 2 spent fuel pool (SFP).

On June 11, 2010, the Nuclear Regulatory Commission (NRC) staff issued a request for additional information (RAI) regarding the bulk SFP calculation methodology (Reference 9). FENOC responded in correspondence dated August 9, 2010 (Reference 8). On September 1, 2010, a telephone call between FENOC and NRC staff was held to discuss NRC staff concerns regarding the SFP bulk thermal analysis. On a September 22, 2010 telephone call, FENOC summarized the results of a SFP bulk thermal analysis that was representative of bounding conditions associated with planned refueling outages.

The following information summarizes the bounding conditions assumed in the SFP bulk thermal analysis and is consistent with the conditions provided in Section 3.1.1.1. of the *Review Standard for Extended Power Uprates* (RS-001) (Reference 10).

- (1) decay heat load is calculated assuming a full core offload initiated at 100 hours after reactor shutdown following a full power cycle of 2,918 megawatts thermal with the SFP containing more than 1,690 assemblies and previous batch

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discharges consisting of 72 assemblies each beginning in the fall 2009 refueling outage; and

- (2) heat removal capability is based on an inlet component cooling water (CCW) temperature of 88 degrees Fahrenheit, a total cooling system flow rate of 2,200 gallons per minute, a total tube side flow rate of 1,500 gallons per minute, two SFP cooling pumps, and two SFP cooling heat exchangers having a tube side fouling factor of 0.0010 [1/Btu/hr/sqft/F] and a shell side fouling factor of 0.0005 [1/Btu/hr/sqft/F]; and,
- (3) alternate heat removal paths, such as evaporative cooling, are conservatively neglected.

The peak bulk SFP temperature was calculated to be 150 degrees Fahrenheit in the bulk thermal analysis realistic case defined above. Bounding assumptions regarding SFP cooling heat exchanger performance were used. Additionally, assuming a loss of all SFP cooling at the time of the peak temperature, the time to boil is greater than three hours and the associated boil-off rate is less than 80 gallons per minute.

The calculated peak SFP temperature occurs following completion of the full core offload and prior to the reactor vessel core reload. During plant MODES 4, 5, 6, and undefined (defueled), the Shutdown Defense in Depth administrative procedure is in effect, which includes observation of the SFP temperature and calculation of the associated time to boil (in the event of a loss of all forced cooling).

While in plant MODES 1 through 6 and defueled, the tour operator monitors the SFP heat exchanger inlet temperatures daily to ensure the maximum SFP heat exchanger temperature does not exceed 140 degrees Fahrenheit.

In accordance with the *Fuel Pool Purification Trouble* alarm response procedure (Reference 11), the Fuel Pool Demineralizer Supply Temperature High alarm is set at 140 degrees Fahrenheit. Following annunciation, Operators will follow the *Fuel Pool Purification Trouble* procedure requirements. If the elevated temperature alarm is valid, the procedure provides steps to shutdown purification flow and then increase cooling of the SFP/refueling cavity.

In accordance with the *Fuel Pool Cooling Trouble* alarm response procedure (Reference 12), the Fuel Pool Temperature High alarms are set at 160 degrees Fahrenheit. Following annunciation, Operators will follow the *Fuel Pool Cooling Trouble* procedure requirements. If the elevated temperature alarm is valid, the procedure provides steps to increase cooling of the SFP.

FENOC will evaluate and if necessary, modify the current 140 degrees Fahrenheit and 160 degrees Fahrenheit SFP alarm setpoints, in conjunction with implementation of the

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BVPS Unit No. 2 rerack license amendment request. The evaluation will ensure that the alarm setpoints are consistent with the analysis assumptions representative of bounding conditions associated with planned refueling outages.

The Attachment provides the Regulatory Commitment made in this submittal. The information provided by this submittal does not invalidate the no significant hazard evaluation submitted by Reference 1. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager – FENOC Fleet Licensing, at 330-761-6071.

I declare under penalty of perjury that the foregoing is true and correct. Executed on October 7, 2010.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul A. Harden", with a long horizontal flourish extending to the right.

Paul A. Harden

Attachment:  
Regulatory Commitment List

References:

1. FENOC Letter L-09-086, "License Amendment Request No. 08-027, Unit 2 Spent Fuel Pool Rerack," dated April 9, 2009 (Accession No. ML091210251).
2. FENOC Letter L-09-162, "Additional Technical Information Pertaining to License Amendment Request No. 08-027 (TAC No. ME1079)," dated June 15, 2009 (Accession No. ML091680614).
3. FENOC Letter L-10-001, "Response to Request for Additional Information for License Amendment Request No. 08-027, Unit 2 Spent Fuel Pool Rerack (TAC No. ME1079)" dated January 18, 2010 (Accession No. ML100191805).
4. FENOC Letter L-10-082, "Response to NRC Staff Request for Additional Information Regarding Criticality Analyses Supporting a Spent Fuel Pool Re-rack for Unit 2 (TAC No. ME1079)," dated March 18, 2010 (Accession No. ML100820165).
5. FENOC Letter L-10-121, "Response to Request for Additional Information for License Amendment Request No. 08-027 (TAC No. ME1079)," dated May 3, 2010 (Accession No. ML101260059).
6. FENOC Letter L-10-151, "Response to Request for Additional Information for License Amendment Request No. 08-027 (TAC No. ME1079)," dated May 21, 2010 (Accession No. ML101460057).
7. FENOC Letter L-10-130, "Remainder of Responses to NRC Staff Request for Additional Information Regarding Unit 2 Spent Fuel Pool Rerack Criticality Analyses (TAC No. ME1079)", dated June 1, 2010 (Accession No. ML101610118).
8. FENOC Letter L-10-235, "Response to Request for Additional Information for License Amendment Request No. 08-027, Unit 2 Spent Fuel Pool Rerack (TAC No. ME1079)", dated August 9, 2010 (Accession No. ML102240256).
9. NRC Letter dated June 11, 2010, titled "BEAVER VALLEY POWER STATION, UNIT NO. 2 - REQUEST FOR ADDITIONAL INFORMATION RE: SPENT FUEL POOL RERACK LICENSE AMENDMENT (TAC NO. ME1079)" (Accession No. ML101380546).
10. RS-001, Review Standard for Extended Power Uprates, Section 3.1.1.1., "Full Cooling System Capability Evaluation," of Attachment 2 to Matrix 5 of Section 2.1, Revision 0, December 2003.
11. 2OM-20.4.AAC, Fuel Pool Purification Trouble, Revision 4.
12. 2OM-20.4.AAA, Fuel Pool Cooling Trouble, Revision 6

cc: NRC Region I Administrator  
NRC Senior Resident Inspector  
NRR Project Manager  
Director BRP/DEP  
Site Representative BRP/DEP

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Regulatory Commitment List  
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The following identifies those actions committed to by FirstEnergy Nuclear Operating Company (FENOC) for Beaver Valley Power Station (BVPS) Unit No. 2 in this document. Any other actions discussed in the submittal represent intended or planned actions by FENOC. They are described only as information and are not Regulatory Commitments. Please notify Mr. Thomas A. Lentz, Manager – Fleet Licensing at (330) 761- 6071 of any concerns regarding this document or associated Regulatory Commitments.

Regulatory Commitment

Due Date

1. FENOC will evaluate and if necessary, modify the current 140 degrees Fahrenheit and 160 degrees Fahrenheit SFP alarm setpoints, in conjunction with implementation of the BVPS Unit No. 2 rerack license amendment request. The evaluation will ensure that the alarm setpoints are consistent with the analysis assumptions representative of bounding conditions associated with planned refueling outages.

1. Subsequent to NRC approval and concurrent with the implementation of License Amendment Request 08-027.