FENOC™
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L-14-163

10 CFR 50, Appendix H

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

SUBJECT:
Beaver Valley Power Station, Unit Nos. 1 and 2
Docket No. 50-334, License No. DPR-66
Docket No. 50-412, License No. NPF-73
Response to Request for Additional Information on Proposed Revision to Reactor Vessel Surveillance Capsule Withdrawal Schedules (TAC Nos. MF1929 and MF1930)

By correspondence dated May 28, 2013 (Accession No. ML13151A058), FirstEnergy Nuclear Operating Company (FENOC) submitted a proposed revision to the Beaver Valley Power Station, Unit Nos. 1 and 2, reactor vessel surveillance capsule withdrawal schedules.

By correspondence dated December 6, 2013 (Accession No. ML13339A437), the Nuclear Regulatory Commission (NRC) requested additional information to complete its review. FENOC provided a response to the request on December 13, 2013 (Accession No. ML13350A581).

By correspondence dated April 22, 2014 (Accession No. ML14101A176), the NRC requested additional information to complete its review. FENOC's response to this request, which is due by May 22, 2014, is attached.

There are no regulatory commitments established in this submittal. If there are any questions or additional information is required, please contact Mr. Thomas A. Lentz, Manager – Fleet Licensing, at (330) 315-6810.

Sincerely,

Eric A. Larson

Attachment: Response to April 22, 2014 Request for Additional Information

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

By correspondence dated May 28, 2013, FirstEnergy Nuclear Operating Company (FENOC) submitted a request to revise the reactor vessel surveillance capsule withdrawal schedules for the Beaver Valley Power Station, Unit Nos. 1 and 2, for Nuclear Regulatory Commission (NRC) review and approval. By correspondence dated December 13, 2013, FENOC responded to an NRC request for additional information.

By correspondence dated April 22, 2014, NRC staff requested additional information to complete its review. The requested information is presented in bold type, followed by the FENOC response.

The table below shows the differences between the peak fluence values for both units, as presently reported, and as calculated to support the license renewal safety review in 2007/2008. The table shows that the Unit 2 peak fluence values for the 48 effective full power years (EFPY) differ by 16 percent, which is judged to be excessive to attribute to the incorporation of 4 additional cycles of core follow data, without further information.

Max. Calculated Fluence, Pressure Vessel Clad/Base Metal Interface		
BVNPS Unit 1 48 EFPY 0° Azimuth	Sept. 2011	April 2008
	WCAP-15571-S1-R2	WCAP-15571-S1-R1
	ML13151A059	ML082740205
	5.36E19	5.42E19
	Cycle 20 →	Cycle 17 →
	% Diff.	1.1 %
BVNPS Unit 2 48 EFPY 0° Azimuth	Sept. 2011	July 2007
	WCAP-16527-NP-S1-R1	WCAP-16527-NP-S1-R0
	ML13151A060	ML072410032
	4.67E19	5.56E19
	Cycle 15 →	Cycle 11 →
	% Diff.	16 %

According to WCAP-14040-A[1], Revision 4, which is the most recent document generically describing Westinghouse's methods for determining pressure vessel neutron fluence, the analytical uncertainty associated with these methods is 13 percent. Thus, the 16 percent difference at Unit 2 exceeds the uncertainty estimated for the method.

[1] Accession No. ML050120209

Given the differences identified in the table above, please provide a summary description explaining what aspects of the neutron fluence methodology and input assumptions were changed between the 2007/2008 evaluations and those submitted in 2013. Provide a sufficiently detailed description to permit the NRC staff to determine independently whether the present calculations are adherent to NRC Regulatory Guide 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence."

Response:
The radiation transport methodology in the 2007/2008 and 2011 evaluations are the same. In the 2007/2008 and 2011 evaluations, discrete ordinates radiation transport calculations in two-dimensional (2-D) r-θ and r-z, and one-dimensional (1-D) r geometries were combined to construct a three-dimensional flux solution based on a 2-D/1-D synthesis technique. This radiation transport methodology follows the guidance and meets the requirements of Regulatory Guide 1.190.

The differences observed at 48 effective full power years (EFPY) at the zero degree (0°) azimuthal location for Beaver Valley Power Station, Unit No. 1 (BVPS-1) and Unit No. 2 (BVPS-2), between the 2007/2008 and 2011 evaluations, are due to the different representative core designs used in future projections. The difference in the peripheral assembly relative power levels near the 0° azimuthal location for the representative cycle designs between the BVPS-2 2007 and 2011 evaluations is more pronounced than the representative cycle designs between the BVPS-1 2008 and 2011 evaluations. For the BVPS-2 analyses, the relative power level of the peripheral assembly near the 0° azimuthal location for the core design used in future fluence projections is significantly higher in the 2007 evaluation than the 2011 evaluation. This difference in the 0° peripheral assembly power level in the future representative core designs that were used in the BVPS-2 2007 and 2011 evaluations is the reason leading to the observed differences in fluence values at 48 EFPY.