UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 14, 2014

LICENSEE: FirstEnergy Nuclear Operating Co.

FACILITY: Beaver Valley Power Station Units 1 and 2

SUBJECT: SUMMARY OF JUNE 18, 2014, **CLOSED** MEETING BETWEEN REPRESENTATIVES OF THE U.S. ARMY CORPS OF ENGINEERS, THE U.S. NUCLEAR REGULATORY COMMISSION AND FIRSTENERGY NUCLEAR OPERATING CO. TO DISCUSS FLOODING ANALYSIS ASSOCIATED WITH BEAVER VALLEY POWER STATION, UNITS 1 AND 2 (TAC NO. MF3286 AND MF3287)

On June 18, 2014, the U.S. Nuclear Regulatory Commission (NRC) staff held a closed meeting with the U.S. Army Corps of Engineers (USACE) and FirstEnergy Nuclear Operating Co. (FENOC) to discuss the flooding hazard reevaluation (FHR) for the Beaver Valley Power Station, Units 1 and 2 (BVPS). The meeting was held at USACE's offices in Pittsburgh, Pennsylvania. The closed meeting notice dated June 17, 2014, can be found in the Agencywide Documents Access and Management System (ADAMS) at Accession No. ML14161A148. The participants in the meeting included the following individuals:

- NRC – Ken See, Brad Harvey, Robert Kuntz, and Barbara Hayes*
- USACE – Roger Kay, Bill Lenart, Mike Helbling, Werner Loehlein, Dennis Zeveney, Steve Lucas, Mark Zaitsoff, Alex Brediklein, Carol Tasillo, Sara Woida, Laura Schroeder, Charles Spicer, Teresa Reinig
- FENOC – Eric Hohman and Carmen Mancuso
- FENOC contractors (Enercon) – John Huggins

* indicates individual participated via phone

By letter dated December 17, 2013 (ADAMS Accession No. ML13353A566), FENOC requested USACE assistance via a letter to the NRC to support FENOC's development of an FHR in response to the March 12, 2012, request for information letter issued pursuant to Title 10 of the *Code of Federal Regulations* Part 50, Section 50.54(f) (ADAMS Accession No. ML12073A348).

During the meeting, the USACE presented it's methodology for screening dams and to identify potentially-critical dams within the BVPS watershed. The USACE and NRC provided FENOC a high-level summary of the preliminary results of the screening analysis and the next steps in USACE's review. These steps include USACE completing a detailed analysis of the potentially-critical dams and the NRC transmitting the USACE results to FENOC.

The agenda for the June 18, 2014, meeting can be found in Enclosure 1. FENOC provided three questions prior to the meeting regarding USACE's dam failure analysis. These questions and the NRC response provided at the meeting can be found in Enclosure 2. In addition, FENOC asked several questions during the discussion. These questions and the NRC's response can be found in Enclosure 2.

The following action item was identified during the meeting:

- FENOC took an action to inform the NRC staff if it wanted hydrographs for locations other than at the BVPS site. For example, some licensees have requested hydrographs at locations upstream and downstream of the nuclear power plant for use as input boundary conditions for a two-dimensional model. The USACE hydrographs are generated using a one-dimensional model.

Subsequent to the meeting and in response to the above action item, FENOC provided the locations for the hydrographs it is requesting from USACE. FENOC requested dam failure hydrographs for each credible scenario at river mile 33.4 (1.5 miles upstream of the BVPS site) in addition to hydrographs at the site.

The USACE was provided an opportunity to comment on this summary prior to its issuance and their comments were addressed in the final version of this summary.

Please direct any inquiries to me at 301-415-3733 or at Robert.Kuntz@nrc.gov.

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Docket Nos. 50-334 and 50-412

Enclosures:
1. Agenda
2. FENOC Questions and Answers

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U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NRC/USACE Scoping Meeting Beaver Valley NPP

June 18, 2014

USACE Pittsburgh District Office
2200 William S. Moorhead Federal Building
1000 Liberty Avenue
Pittsburgh, Pa 15222-4186

----- Agenda Topics -----		
WEDNESDAY JUNE 18		
Arrival for Security Screening	NRC/FERC/FENOC	08:45 – 09:00
Introductions	ALL	09:00 – 09:15
• Beaver Valley NPP Watershed Management • Hydrologic and Hydraulic Modeling Methods • Licensee's questions and answers	USACE USACE FENOC/NRC/ USACE	09:15 – 09:45 09:45 – 10:15 10:15 – 11:00
BREAK		11:00 – 11:30
Continued discussions as necessary	FENOC/NRC/ USACE	11:30 – 12:00

FENOC's Questions on USACE's Dam Failure Analysis

The following are three questions from FirstEnergy Nuclear Operating Co. (FENOC) provided prior to the meeting regarding United States Army Corps of Engineers (USACE) Dam Failure Analysis for the Beaver Valley Power Station, Units 1 and 2 (BVPS) watershed.

Question 1

Background:

For the flooding re-evaluation analysis at BVPS, three precipitation scenarios are being evaluated:

- The All-Season Probable Maximum Precipitation (PMP) for a 72-hour storm duration
- A combination of the Cool-Season PMP for a 72-hour duration plus 100-year frequency snowpack with snowmelt for the same 72- hour period
- A combination of the 100-year frequency rainfall for a 72-hour duration plus Probable Maximum Snowpack (unlimited snowpack) with snowmelt for the same 72-hour period

Question:

Will the USACE provide dam failure hydrographs for all three PMP scenarios as described?

NRC Response:

The USACE will provide dam failure hydrographs for the first scenario listed, the all-season PMP for a 72-hour storm duration only. The USACE considers that scenario bounding for all of the listed scenarios given the history of the BVPS watershed.

Question 2

Background:

For the flooding re-evaluation analysis at BVPS, a site-specific PMP for the region developed by a meteorological consultant is used in the analysis of the PMF with regard to the three scenarios explained in the previous question. This site-specific PMP was developed to provide a regionally accurate PMP using more updated storm data that precedes the published Hydrometeorological Report (HMR) Nos. 51 and 52 for the Eastern United States. Use of the HMR guidance in determination of the PMP for dam failure will not align with methodology used in the flooding re-evaluation performed thus far. Site-specific PMP values tend to be lower than those provided by HMR guidance.

Question:

Will the USACE use a site-specific PMP for the calculation of dam failure hydrographs or use the standard HMR guidance?

NRC Response:

The USACE will use the National Weather Service HMRs applicable to the BVPS watershed.

Question 3

Background:

A screening of all the dams based on in the BVPS watershed has identified six critical dams and two potentially critical dams. One of these dams (Lake Arthur) is not a USACE-regulated dam and is managed by the Pennsylvania Department of Natural Resources.

Question:

Will the USACE dam failure analysis provide hydrologic, seismic and sunny day dam failure hydrographs for each critical and potentially critical dam requested or will the USACE provide hydrologic, seismic and sunny day dam failure hydrographs for one location just upstream of the BVPS site?

NRC Response:

The USACE will provide hydrographs for all applicable dam failures (i.e. if seismic dam failure is not a credible failure mechanism for a critical dam, a seismic hydrograph will not be provided). The locations provided by the USACE can be any location the licensee requests downstream of the last dam before the BVPS site and upstream of the first dam after the site.

The following are additional questions from FENOC posed during the meeting regarding USACE Dam Failure Analysis for the BVPS watershed.

Additional Questions/Responses:

1) **During the USACE presentation summarizing the preliminary dam screening results, FENOC asked if the USACE intended to perform the "Hydrologic Model Method" as described in JLD-ISG-2013-01, Section 3.2.**

NRC response: The USACE performed dam screening following the graded conservatism approach outlined in NRC interim staff guidance (ISG) JLD-ISG-2013-01, Section 3.2. The USACE screened dams located in the BVPS watershed using the Volume Method, Peak Outflow without Attenuation Method and Peak Outflow with Attenuation Method. The most realistic "Hydrologic Model Method" will not be used to screen dams in the BVPS watershed based on the accelerated schedule of the analysis. If an existing hydrologic model is available the USACE will make a good-faith effort to confirm the screening results are accurate.

2) **With Dam Failure results only being provided with the controlling Probable Maximum Flood (PMF) Alternative, per NUREG/CR-7046, how is FENOC to determine values on the other two PMF alternatives (Cool-season PMFs) without specific dam failure information for those alternatives? How is FENOC to reconcile the potential inconsistencies in the Flood Hazard Re-evaluation Report (FHRR) without full knowledge and aligned input parameters?**

NRC response: The riverine hazard portion of the re-evaluation will be performed by the USACE and will be provided to FENOC pre-reviewed and pre-accepted by the NRC.

The USACE will only be providing hydrographs for the controlling alternative. FENOC will only need to consider the hydrographs provided by the USACE for the riverine hazard portion of the BVPS re-evaluation. The two (lesser) alternatives will not be provided to FENOC and therefore will not need to be included in the BVPS FHR. Wind wave action, channel migration, ice jam analysis, and local intense precipitation are still required to be evaluated by FENOC.

3) **FENOC asked if an additional meeting can be arranged between the NRC/USACE/FENOC to discuss inputs into the analysis and for FENOC to provide site specific developed parameters to the USACE.**

NRC response: No additional meeting will be held before the USACE completes their work. The USACE will not be using any site specific inputs provided by FENOC. FENOC will have an opportunity to discuss questions on the inputs/assumptions to the analysis at a later meeting after the USACE completes the analysis.

4) **When discussing the starting dam reservoir pool elevations the USACE will be using in their models, the NRC responded that inputs would be the most conservative, per JLD-ISG-2013-01, unless otherwise justified by the USACE. FENOC asked if the USACE feels that alternative starting pool levels are justifiable.**

NRC response: History shows that the dams are not operated at the full pool elevation. More than likely the USACE will consider the history of lower elevations. Once the USACE analysis is finalized, FENOC will have an opportunity to discuss questions on the inputs/assumptions to the analysis at a later meeting after the USACE completes the analysis.

5) **What is the timeframe for the results to be provided to FENOC?**

NRC response: The Scope and Schedule meeting for the results is being held between the NRC and USACE this afternoon (June 18, 2014). No contract is in place yet between the NRC and USACE for this work. An optimistic date for FENOC to receive dam failure results is 4 months from today (October 18, 2014).

6) **FENOC asked for clarification on where additional hydrographs other than the site may be requested.**

NRC response: FENOC must request additional hydrographs between the Montgomery Locks and Dam and the New Cumberland Locks and Dam. No individual hydrographs "just downstream" of the critical dams will be provided. This is due to the river structures being federally owned and the information on them not being available to the public (FENOC).

This is a requirement that has been adhered to by other utilities requesting information on federally owned dams from the USACE.

7) Will the critical dams be identified in the results given to FENOC?

NRC response: Hydrographs at the site per critical dam (or group of critical dams), per "credible scenario" will be provided. Therefore, any critical dams will be identified by the results provided to FENOC. These hydrographs will not need to be combined or manipulated by FENOC. The reason for multiple hydrographs is for FENOC to determine the critical Warning Time, Flood Duration and critical Water Surface Elevation, which may be from separate scenarios. Since the hydrographs are not being provided just downstream of critical dams, the results provided will include sufficient information to determine the Warning time and the Flood Duration at the BVPS site from each critical dam.

8) How will non-linear basin response of the unit hydrograph be performed by the USACE?

NRC response: Peaking factors determined by the standard USACE guidance will be considered. These will be justified by the USACE and may be in the range of increasing the peak flow by 25 percent - 50 percent and will depend on the unit hydrograph derived. This may be discussed at a later meeting after the USACE completes the analysis.

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/RA/

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ADAMS Accession Nos.: Meeting Notice ML14161A148 Meeting Summary ML14184B196 *via email

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