



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

November 21, 2013

Mr. Eric A. Larson, Site Vice President  
FirstEnergy Nuclear Operating Company  
Beaver Valley Power Station  
Mail Stop A-BV-SEB1  
P.O. Box 4, Route 168  
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNITS 1 AND 2 - AUDIT REPORT REGARDING SEISMIC WALKDOWNS TO SUPPORT IMPLEMENTATION OF NEAR-TERM TASK FORCE RECOMMENDATION 2.3 RELATED TO THE FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT ACCIDENT (TAC NOS. MF0092 AND MF0093)

Dear Mr. Larson:

On March 12, 2012, the U.S. Nuclear Regulatory Commission staff (NRC or the staff) issued a request for information letter per Title 10 of the *Code of Federal Regulations*, Subpart 50.54(f) (50.54(f) letter).<sup>1</sup> The 50.54(f) letter was issued to power reactor licensees and holders of construction permits requesting addressees to provide further information to support the NRC staff's evaluation of regulatory actions to be taken in response to lessons learned from Japan's March 11, 2011, Great Tōhoku Earthquake and subsequent tsunami. The request addressed the methods and procedures for plants to conduct seismic and flooding hazard walkdowns to identify and address degraded, nonconforming, or unanalyzed conditions through the corrective action program, and to verify the adequacy of the monitoring and maintenance procedures.

By letter dated November 27, 2012,<sup>2</sup> and as supplemented by letter dated September 24, 2013,<sup>3</sup> FirstEnergy Nuclear Operating Company (FENOC) submitted the Seismic Walkdown Report as requested in Enclosure 3 of the 50.54(f) letter for the Beaver Valley Power Station, Units 1 and 2. On July 23 - 25, 2013, an NRC team performed an on-site audit to gain a better understanding of the methods and procedures used by FENOC to conduct the seismic walkdowns and facilitate the NRC staff review of the walkdown report. The audit report is enclosed.

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<sup>1</sup> Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340.

<sup>2</sup> ADAMS Accession No. ML130080030.

<sup>3</sup> ADAMS Accession No. ML13284A030.

E. Larson

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If you have any questions, please contact me at 301-415-4090 or by e-mail at [Jeffrey.White@nrc.gov](mailto:Jeffrey.White@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Jeffrey A. White". The signature is written in a cursive style with a large initial "J".

Jeffrey A. White, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

Enclosure:  
Audit Report

cc w/encl: Distribution via Listserv

REPORT OF REGULATORY AUDIT ON JULY 23 TO JULY 25, 2013.

SEISMIC WALKDOWNS

FIRST ENERGY NUCLEAR OPERATING COMPANY (FENOC)

BEAVER VALLEY POWER STATION, UNITS 1 and 2

DOCKET NOS. 50-334 and 50-412

BACKGROUND

On March 12, 2012, the U.S. Nuclear Regulatory Commission staff (NRC or the staff) issued a request for information letter per Title 10 of the *Code of Federal Regulations*, Subpart 50.54(f) (50.54(f) letter).<sup>1</sup> The 50.54(f) letter was issued to power reactor licensees and holders of construction permits requesting addressees to provide further information to support the NRC staff's evaluation of regulatory actions to be taken in response to lessons learned from Japan's March 11, 2011, Great Tōhoku Earthquake and subsequent tsunami. The request addressed the methods and procedures for plants to conduct seismic and flooding hazard walkdowns to identify and address degraded, nonconforming, or unanalyzed conditions through the corrective action program, and to verify the adequacy of the monitoring and maintenance procedures.

By letter dated November 27, 2012,<sup>2</sup> and as supplemented by letter dated September 24, 2013,<sup>3</sup> FirstEnergy Nuclear Operating Company (FENOC) submitted the Seismic Walkdown Report as requested in Enclosure 3 of the 50.54(f) letter (Recommendation 2.3: Seismic) for the Beaver Valley Power Station, Units 1 and 2 (Beaver Valley). On July 23 - 25, 2013, an NRC team performed an on-site audit to gain a better understanding of the methods and procedures used by FENOC to conduct the seismic walkdowns and facilitate the NRC staff review of the walkdown report.

REGULATORY AUDIT BASIS

The guidance for performing the seismic walkdowns was developed by the Electric Power Research Institute (EPRI) with review and input from the NRC staff in numerous public meetings, webinars, and public conference calls during its development. The EPRI submitted EPRI-1025286, "Seismic Walkdown Guidance for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic"<sup>4</sup> (walkdown guidance) for endorsement, and the staff subsequently endorsed the walkdown guidance by letter dated May 31, 2012.<sup>5</sup> By letter dated July 10, 2012,<sup>6</sup> FENOC indicated that they would utilize the walkdown guidance in the performance of the walkdowns at Beaver Valley.

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<sup>1</sup> Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340.

<sup>2</sup> ADAMS Accession No. ML130080030.

<sup>3</sup> ADAMS Accession No. ML13284A030.

<sup>4</sup> ADAMS Accession No. ML12164A181.

<sup>5</sup> ADAMS Accession No. ML12145A529.

<sup>6</sup> ADAMS Accession No. ML12192A615.

The 50.54(f) letter and the walkdown guidance were used as the basis documents upon which the regulatory audit was performed.

### AUDIT ACTIVITIES

The NRC audit team consisted of Nilesh Chokshi (NRC/NRO), Scott Flanders (NRC/NRO), Rebecca Karas (NRC/NRO), James Isom (NRC/NRR), Frankie Vega (NRC/NRO), Erin Carfang (NRC/RI) and Yu Tang (NRC contractor).

The audit team reviewed the following types of information:

- Beaver Valley A-46 Report for Unit 1
- Anchorage drawings and calculations
- Condition reports (CRs) issued for conditions identified during the walkdowns and area walk-bys
- Pre-Audit self-assessment
- Completed walkdown checklists for the following components including design drawings and calculations:
  - Walkdown for equipment ID PNL-SEQ-244, Instrument Control and Panels – seismic interaction potential between lighting fixture and PNL-SEQ-244 (CR-2012-14463)
  - Walk-by for Primary Auxiliary Building, 735 ft. 6 inch elevation, East Central – missing bolt near hanger (CR-2012-14047)
  - Walkdown for Equipment ID BAT – CHG1-2-A, Battery charger and inverter – battery charger and switchboard not bolted together (CR-2012-14321)
  - The Seismic Evaluation Worksheet (SEWS) for Motor Control Center (MCC)-1-E7 to explain the reason why a top brace was used for MCC-1-E8 and not for other such as MCC-E7. The staff noted this inconsistency during their independent walkdowns

The audit team performed an independent review of selected items and areas based on the licensee's walkdowns. They observed and discussed the following conditions with the licensee to further understand the licensee's overall walkdown processes:

- 1EE-EG-1 - the support beams for the emergency diesel generator (EDG) skids were identified as not grouted along their entire length. An A-46 documentation justifies its acceptability. In this same room, the staff noted that MCC-E8 was braced at the top, while other MCCs were not; for example MCC E-7 was not braced. The licensee provided the SEWS for MCC-1-E7 to explain why it was acceptable for this MCC not to be braced.
- 1EE-EG-2 - the support beams for the EDG skids were identified as not grouted along their entire length. An A-46 and design documentation justifies its acceptability.

- MCC-1-E6 and E12 – the staff verified the possible interaction issue between cable trays and the MCCs. Displacement calculations demonstrated that the available gap was adequate.
- BAT-CHGI-2-A – the staff verified the possible interaction issue between the battery charger and switchboard. CR-2012-14321 was issued to bolt these components together. These components are located inside the 'DF' Switchgear Room at the 713 ft. elevation in the Unit 1 Service Building
- Battery room – the staff performed a walkdown in this room specifically to verify the structural integrity of the lightly reinforced block walls that were qualified based on IE Bulletin 80-11, "Masonry Wall Design."
- Fuel Building (Area Walk-by Checklist (AWC)) – the staff verified the possible interaction issue between a space heater inlet piping and nearby large diameter piping that might cause spray concerns in the area. Nearby equipment (lightning transformer and panel) was judged to be outside of the spray zone; so, the interaction issue was determined not to be a concern.
- TRS BIP PNC1 – the staff noted a missing fastener and CR-2013-11359 was issued to address the issue.
- A laterally unsupported 50 ft. pipe connecting pump 2FNC – P21A and heat exchanger 2FNC-E21A. Based on nozzle load and pipe stress calculations, the licensee found this configuration to be adequate.
- Fire protection system panel BV-PNL-BIP – the staff noted a missing fastener in the back panel of component; CR-2013-11362 was issued to address the issue.
- Primary Auxiliary Building –missing bolt near hanger; CR 2012-14047 was issued to address the issue.

### AUDIT SUMMARY

The NRC audit team engaged in various discussions, including individual interviews with the licensee and its contractor, that led to a significant increase in the level of clarity on the processes used by the licensee when conducting seismic walkdowns.

Specifically, the staff obtained additional clarification regarding:

- the background and qualifications of individuals who conducted the seismic walkdown activities,
- the participation and roles of the operations staff,
- the scope of peer review and the experience and independence of the peer reviewers,
- the development of the seismic walkdown equipment list (SWEL),
- the conduct and the reporting of the seismic walkdowns and area walk-bys, and
- the approach used to disposition potential issues identified during the walkdown activities.

By discussing these specific topics in depth with the licensee and reviewing the documentation mentioned above, the team was able to meet the objectives of the audit and has the information and understanding of the licensee's process regarding seismic walkdowns sufficient to address the issues identified in the audit plan. It should be noted that the licensee performed a self-

assessment in preparation for this audit and noted several documentation anomalies similar to the ones previously noted by the staff in their review.

The licensee committed to submit an updated seismic walkdown report during the audit. This report was submitted on September 24, 2013, and provided additional clarity on the licensee's walkdown process.

Specifically, the following updates were included:

- the licensing basis information for Seismic Category 1 structures, systems and components (codes and standards),
- operations staff resumes,
- corrections to a Seismic Walkdown Engineer resume,
- clarification on another Seismic Walkdown Engineer's involvement in seismic walkdowns,
- clarification on one person's involvement as a SWEL developer,
- the roles of peer reviewers,
- a cover page for equipment selection personnel signatures,
- full individual plant examination of external events enhancement lists,
- updated table with Corrective Action Plan documentation and CR summary list with origination dates, and
- updated checklists with additional discussions and calculations on potential adverse seismic conditions that were not addressed in the Corrective Action Plan documentation or CR.

#### Entrance Meeting (July 23, 2013)

The NRC staff discussed the audit plan including the scope, topics of discussions and possible path forward with the licensee. The licensee provided a presentation regarding their self-assessment and stated their intention to submit an updated report.

#### Exit Meeting (July 25, 2013)

The NRC team summarized the activities that were conducted and described the issues that were identified during the three-day audit. The licensee was given the opportunity to ask questions. The NRC described its path forward, including issuance of an audit report and a formal staff assessment. The licensee committed to update their seismic walkdown report within 60 days of the audit.

#### POST AUDIT CLARIFICATIONS

The staff conducted a conference call with the licensee on September 4, 2013, to provide clarification on the requested modifications to the updated seismic walkdown report discussed during the staff's audit. The licensee agreed to provide this information and submitted an updated walkdown report by letter dated September 24, 2013. This will facilitate development of the staff assessment for Beaver Valley's walkdown reports.

CONCLUSION

During the audit, the staff gained a better understanding of the methods and procedures used by FENOC when conducting seismic walkdown activities at the Beaver Valley. Specific clarifications and additional information needed by the NRC staff regarding the licensee's seismic walkdown report were identified and discussed with FENOC staff. In response, the licensee submitted updated seismic walkdown reports by letter dated September 24, 2013.

Based on the information gained during the audit and in conjunction with the original report and supplemental information submitted by the licensee, the NRC staff has sufficient information to complete a staff assessment of the licensee's response to the 50.54(f) letter.

If you have any questions, please contact me at 301-415-4090 or by e-mail at [Jeffrey.White@nrc.gov](mailto:Jeffrey.White@nrc.gov).

Sincerely,

/ra/

Jeffrey A. Whited, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

Enclosure:  
Audit Report

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**ADAMS Accession No.: ML13295A695**

**\*via email**

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