



FirstEnergy Nuclear Operating Company

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February 9, 2016  
L-16-003

10 CFR 2.202

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-001

**SUBJECT:**

Davis-Besse Nuclear Power Station  
Docket No. 50-346, License No. NPF-3  
FirstEnergy Nuclear Operating Company's (FENOC's) Sixth Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) (CAC No. MF0960)

On March 12, 2012, the Nuclear Regulatory Commission (NRC or Commission) issued an order (Reference 1) to FENOC. Reference 1 was immediately effective and directs FENOC to have a reliable indication of the water level in associated spent fuel storage pools. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of an initial status report 60 days following issuance of the final interim staff guidance (Reference 2) and an overall integrated plan pursuant to Section IV, Condition C. Reference 2 endorses industry guidance document Nuclear Energy Institute (NEI) 12-02, Revision 1 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided the FENOC initial status report regarding requirements for reliable spent fuel pool instrumentation. Reference 5 provided the FENOC overall integrated plan for Beaver Valley Power Station (BVPS), Unit Nos. 1 and 2, Davis-Besse Nuclear Power Station (DBNPS), and Perry Nuclear Power Plant (PNPP).

Reference 1 requires submission of a status report at six-month intervals following submittal of the overall integrated plan. Reference 3 provides direction regarding the content of the status reports. The purpose of this letter is to provide the sixth

six-month status report pursuant to Section IV, Condition C.2, of Reference 1, that delineates progress made in implementing the requirements of Reference 1. The attached report for DBNPS provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

The NRC staff also issued an interim staff evaluation (Reference 6) that included requests for additional information (RAIs). The NRC staff subsequently indicated the intention to complete the ongoing review of the responses to Reference 1 by conducting audits and utilizing the ePortal system for review of RAI responses (Reference 7). The attached report has been updated to reflect this process change.

This letter contains no new regulatory commitments. If you have any questions regarding this report, please contact Mr. Thomas A. Lentz, Manager – Fleet Licensing, at 330-315-6810.

I declare under penalty of perjury that the foregoing is true and correct. Executed on February 9, 2016.

Respectfully,



Brian D. Boles

**Attachment:**

Davis-Besse Nuclear Power Station Sixth Six-Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation

**References:**

1. NRC Order Number EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated March 12, 2012.
2. NRC Interim Staff Guidance JLD-ISG-2012-03, Compliance with Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, Revision 0, dated August 29, 2012.
3. NEI 12-02, Industry Guidance for Compliance with NRC Order EA-12-051, "To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," Revision 1, dated August 2012.
4. FirstEnergy Nuclear Operating Company's (FENOC's) Initial Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated October 26, 2012.
5. FirstEnergy Nuclear Operating Company's (FENOC's) Overall Integrated Plan in Response to March 12, 2012 Commission Order Issuance of Order to Modify

Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated February 27, 2013.

6. Davis-Besse Nuclear Power Plant Unit No. 1 - Interim Staff Evaluation and Request for Additional Information Regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation, dated December 11, 2013.
7. NRC Audits of Licensee Responses to Reliable Spent Fuel Pool Instrumentation Order EA-12-051, dated March 26, 2014.

cc: Director, Office of Nuclear Reactor Regulation (NRR)  
NRC Region III Administrator  
NRC Resident Inspector  
NRC Project Manager  
Ms. Lisa M. Regner, NRR/JLD/PMB, NRC  
Mr. Blake A. Purnell, NRR/JLD/PMB, NRC  
Utility Radiological Safety Board (without Attachment)

Davis-Besse Nuclear Power Station Sixth Six-Month Status Report for the  
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## **1 Introduction**

FirstEnergy Nuclear Operating Company (FENOC) developed an Overall Integrated Plan (OIP) for Davis-Besse Nuclear Power Station (Reference 1 in Section 8), documenting the requirements to install reliable spent fuel pool (SFP) level instrumentation (LI), in response to Reference 2. This attachment provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

## **2 Milestone Accomplishments**

The following milestone(s) have been completed since July 31, 2015 and are current as of January 31, 2016.

- Update 5 was submitted
- Commissioning of SFP Instrumentation

## **3 Milestone Schedule Status**

The following provides an update to the milestone schedule to support the OIP. This section provides the activity status of each item and the expected completion date, noting any change. The dates are planning dates subject to change as design and implementation details are developed.

The milestones indicate the number assigned in the interim staff evaluation (ISE) (Reference 3) to each request for additional information (RAI). Updates to RAI responses were posted on the ePortal as indicated in Reference 4.

There are no revised milestone target completion dates.

Milestone	Target Completion Date	Activity Status (as of 7/31/15)	Revised Target Completion Date
Submit Six-Month Status Updates			
<i>Update 1</i>	August 2013	Complete	
<i>Update 2, including response to ISE RAI-1, RAI-2, RAI-3, RAI-4 (except 4b schematic), RAI-6, RAI-9, and RAI-10a</i>	February 2014	Complete	
<i>Update 3</i>	August 2014	Complete	
<i>Update 4</i>	February 2015	Complete	
<i>Update 5</i>	August 2015	Complete	
<i>Post response to ISE RAI-4b schematic, RAI-5, RAI-7, RAI-8, RAI-10b, RAI-11, RAI-12, RAI-13, RAI-14, and RAI-15 on ePortal</i>	September 2015	Complete	
<i>Update 6</i>	February 2016	Started	
Commence SFP Instrumentation Design	4Q12	Complete	
Commence SFP Instrumentation Procurement	2Q13	Complete	
Complete SFP Instrumentation Design	1Q15	Complete	
SFP Instrumentation Delivery	4Q14	Complete	
Begin SFP Instrumentation Installation	2Q15	Complete	
Commissioning of SFP Instrumentation	3Q15	Complete*	
NRC Order Implementation Date (based on the scheduled end of the second refueling outage after implementation plan submittal)	Spring 2016	Not Started	

\*Instrumentation has been installed. Connection of backup power source is to be completed during the spring 2016 refueling outage.

#### 4 Changes to Compliance Method

There are no changes to the compliance method as documented in the OIP (Reference 1).

#### 5 Need for Relief/Relaxation and Basis for the Relief/Relaxation

FENOC expects to comply with the order implementation date. Relief/relaxation is not required at this time.

#### 6 Open Items from Overall Integrated Plan and Interim Staff Evaluation

The following tables provide a summary of the open items documented in the OIP or the ISE and the status of each item.

Overall Integrated Plan Open Item	Status
None	Not Applicable

Interim Staff Evaluation Open Item	Status
RAI-1: Please specify for Level 1 how the identified location	Complete. (Provided in

<b>Interim Staff Evaluation Open Item</b>	<b>Status</b>
represents the higher of the two points described in the NEI 12-02 guidance for this level.	February 2014 status report.)
RAI-2: Please provide a clearly labeled sketch depicting the elevation view of the proposed typical mounting arrangement for the portions of the instrument channel consisting of permanent measurement channel equipment (e.g., fixed level sensors and/or stilling wells, and mounting brackets). Indicate on this sketch the datum values representing Level 1, Level 2, and Level 3, as well as the top of the fuel racks. Indicate on this sketch the portion of the level sensor measurement range that is sensitive to measurement of the fuel pool level, with respect to the Level 1, Level 2, and Level 3, datum points.	Complete. (Provided in February 2014 status report.)
RAI-3: Please provide a clearly labeled sketch or marked-up plant drawing of the plan view of the SFP area, depicting the SFP inside dimensions, the planned locations/placement of the primary and back-up SFP level sensor, and the proposed routing of the cables that will extend from these sensors toward the location of the read-out/display device.	Complete. (Provided in February 2014 status report.)
RAI-4: Please provide the following: (a) The design criteria that will be used to estimate the total loading on the mounting device(s), including static weight loads and dynamic loads. Describe the methodology that will be used to estimate the total loading, inclusive of design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces. (b) A description of the manner in which the level sensor (and stilling well, if appropriate) will be attached to the refueling floor and/or other support structures for each planned point of attachment of the probe assembly. Indicate in a schematic the portions of the level sensor that will serve as points of attachment for mechanical/mounting or electrical connections. (c) A description of the manner by which the mechanical connections will attach the level instrument to permanent SFP structures so as to support the level sensor assembly.	Complete. (Provided in February 2014 status report with exception of 4b schematic. 4b schematic posted on ePortal.)
RAI-5: For RAI 4(a) above, please provide the results of the analyses used to verify the design criteria and methodology for seismic testing of the SFP instrumentation and the electronics units, including, design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces.	Complete. (Response posted on ePortal.)
RAI-6: For each of the mounting attachments required to attach SFP Level equipment to plant structures, please describe the design inputs, and the methodology that was used to qualify the structural integrity of the affected structures/equipment.	Complete. (Provided in February 2014 status report.)
RAI-7: Please provide the following: (a) A description of the specific method or combination of methods that will be applied to demonstrate the reliability of the permanently installed equipment under BDB ambient temperature, humidity, shock, vibration, and radiation conditions. (b) A description of the testing and/or analyses that will be	Complete. (Response posted on ePortal.)

<b>Interim Staff Evaluation Open Item</b>	<b>Status</b>
<p>conducted to provide assurance that the equipment will perform reliably under the worst-case credible design basis loading at the location where the equipment will be mounted. Include a discussion of this seismic reliability demonstration as it applies to (a) the level sensor mounted in the SFP area, and (b) any control boxes, electronics, or read-out and re-transmitting devices that will be employed to convey the level information from the level sensor to the plant operators or emergency responders.</p> <p>(c) A description of the specific method or combination of methods that will be used to confirm the reliability of the permanently installed equipment such that following a seismic event the instrument will maintain its required accuracy.</p>	
<p>RAI-8: For RAI 7 above, please provide the results from the selected methods, tests and analyses used to demonstrate the qualification and reliability of the installed equipment in accordance with the Order requirements.</p>	<p>Complete. (Response posted on ePortal.)</p>
<p>RAI-9: Please provide the following:</p> <p>(a) A description of the manner the two channels of the proposed level measurement system meet the independence requirement to minimize, to the extent practicable, the potential for a common cause event to adversely affect both channels.</p> <p>(b) Further information describing the design and installation of each level measurement system, consisting of level sensor electronics, cabling, and readout devices. Please address how independence of these components of the primary and back-up channels is achieved through the application of independent power sources, physical and spatial separation, independence of signals sent to the location(s) of the readout devices, and the independence of the displays.</p>	<p>Complete. (Provided in February 2014 status report.)</p>
<p>RAI-10: Please provide the following:</p> <p>(a) A description of the electrical ac power sources and capabilities for the primary and backup channels.</p> <p>(b) Please provide the results of the calculation depicting the battery backup duty cycle requirements demonstrating that its capacity is sufficient to maintain the level indication function until offsite resource availability is reasonably assured.</p>	<p>Complete. (Provided RAI-10a response in February 2014 status report. Response to RAI-10b posted on ePortal.)</p>
<p>RAI-11: Please provide the following:</p> <p>(a) An estimate of the expected instrument channel accuracy performance (e.g., in percent of span) under both (a) normal SFP level conditions (approximately Level 1 or higher) and (b) at the BDB conditions (i.e., radiation, temperature, humidity, post-seismic and post-shock conditions) that would be present if the SFP level were at the Level 2 and Level 3 datum points.</p> <p>(b) A description of the methodology that will be used for determining the maximum allowed deviation from the instrument channel design accuracy that will be employed under normal operating conditions as an acceptance criterion for a calibration procedure to flag to operators and to technicians that the channel requires adjustment to within the normal condition design accuracy.</p>	<p>Complete. (Response posted on ePortal.)</p>
<p>RAI-12: Please provide the following:</p> <p>(a) A description of the capability and provisions the proposed level</p>	<p>Complete. (Response posted on ePortal.)</p>

Interim Staff Evaluation Open Item	Status
<p>sensing equipment will have to enable periodic testing and calibration, including how this capability enables the equipment to be tested in-situ.</p> <p>(b) A description of the testing and calibration necessary to enable the conduct of regular channel checks of each independent channel against the other, and against any other permanently-installed SFP level instrumentation.</p> <p>(c) A description of the calibration tests and functional checks processes to be performed, and their frequency. Discuss the steps to be taken to ensure these surveillances will be incorporated into the plant surveillance program.</p> <p>(d) A description of the preventive maintenance tasks are required to be performed during normal operation, and the planned maximum surveillance interval necessary to ensure that the channels are fully conditioned to accurately and reliably perform their functions when needed.</p>	
<p>RAI-13: Please provide a list of the procedures addressing operation (both normal and abnormal response), calibration, test, maintenance, and inspection procedures that will be developed for use of the SFP instrumentation. The licensee is requested to include a brief description of the specific technical objectives to be achieved within each procedure.</p>	<p>Complete. (Response posted on ePortal.)</p>
<p>RAI-14: Please provide the following:</p> <p>(a) Further information describing the maintenance and testing program the licensee will establish and implement to ensure that regular testing and calibration is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. Include a description of your plans for ensuring that necessary channel checks, functional tests, periodic calibration, and maintenance will be conducted for the level measurement system and its supporting equipment.</p> <p>(b) A description of the approach and process to be used by the licensee to follow guidance in NEI 12-02 Section 4.3 regarding compensatory actions for one or both non-functioning channels.</p> <p>(c) A description of the compensatory actions to be taken in the event that one of the instrument channels cannot be restored to functional status within 90 days.</p>	<p>Complete. (Response posted on ePortal.)</p>
<p>RAI-15: Please provide a description of the in-situ calibration process at the SFP location that will result in the channel calibration being maintained at its design accuracy.</p>	<p>Complete. (Response posted on ePortal.)</p>

## 7 Potential Interim Staff Evaluation Impacts

There are no potential impacts to the ISE identified for this reporting period.



## **8 References**

The following references support the updates to the OIP described in this attachment.

1. FirstEnergy Nuclear Operating Company's (FENOC's) Overall Integrated Plan in Response to March 12, 2012 Commission Order Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated February 27, 2013.
2. Nuclear Regulatory Commission (NRC) Order Number EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated March 12, 2012.
3. Davis-Besse Nuclear Power Plant Unit No. 1 – Interim Staff Evaluation and Request for Additional Information Regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation, dated December 11, 2013.
4. NRC Audits of Licensee Responses to Reliable Spent Fuel Pool Instrumentation Order EA-12-051, dated March 26, 2014.