FENOC
First Energy Nuclear Operating Company

76 South Main Street
Akron. Ohio 44308

Samuel L. Belcher
Senior Vice President and Chief Operating Officer

August 28, 2014
L-14-259

10 CFR 2.202

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

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
Davis-Besse Nuclear Power Station
Docket No. 50-346, License No. NPF-3
Perry Nuclear Power Plant
Docket No. 50-440, License No. NPF-58
FirstEnergy Nuclear Operating Company's (FENOC's) Third 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)
(TAC Nos. MF0799, MF0800, MF0960, and MF0802)

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 third

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 reports for BVPS, DBNPS, and PNPP (Attachments 1, 2, and 3, respectively) provide 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 interim staff evaluations (References 6, 7, and 8) 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 9). The attached reports have 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 August 28, 2014.

Respectfully,

Samuel L. Belcher

Attachments:
1. Beaver Valley Power Station Third Six-Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation
2. Davis-Besse Nuclear Power Station Third Six-Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation
3. Perry Nuclear Power Plant Third 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. Beaver Valley Power Station, Units 1 and 2 - 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 November 19, 2013
7. Davis-Besse Nuclear Power Plant Unit No. 1 - Interim Staff Evaluation and Request for Additional Informtion Regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation, dated December 11, 2013
8. Perry Nuclear Power Plant, Unit 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
9. 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 I Administrator
NRC Region III Administrator
NRC Resident Inspector (BVPS)
NRC Resident Inspector (DBNPS)
NRC Resident Inspector (PNPP)
NRC Project Manager (BVPS)
NRC Project Manager (DBNPS)
NRC Project Manager (PNPP)
Ms. Lisa M. Regner, NRR/JLD/PMB, NRC
Mr. Blake A. Purnell, NRR/JLD/PMB, NRC
Director BRP/DEP (without Attachments)
Site BRP/DEP Representative (without Attachments)
Utility Radiological Safety Board (without Attachments)

Beaver Valley Power Station Third Six-Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation

1 Introduction

FirstEnergy Nuclear Operating Company (FENOC) developed an Overall Integrated Plan (OIP) for Beaver Valley Power Station (BVPS), Unit Nos. 1 and 2 (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 January 31, 2014 and are current as of July 21, 2014.

- Update 2 was submitted.

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 following milestones are being modified as part of this update to indicate the number assigned in the interim staff evaluation (ISE) (Reference 3) to each request for additional information (RAI) and update the action to post the RAI response on the ePortal by September 2014 as indicated in Reference 4.

Submit Six-Month Status Updates

- Update 3: August 2014
- 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: September 2014

The revised milestone target completion dates do not impact the order implementation date.

Milestone	Target Completion Date	Activity Status (as of 7/21/14)	Revised Target Completion Date
Submit Six-Month Status Updates (Unit Nos. 1 and 2)			
Update 1	August 2013	Complete	
Update 2, including response to ISE RAI-1, RAI-2, RAI-3, RAI-4 (except 4b schematic), RAI-6, RAI-9, and RAI-10a	February 2014	Complete	
Update 3	August 2014	Started	
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	September 2014	Started	
Update 4	February 2015	Not Started	
Update 5	August 2015	Not Started	
BVPS Unit No. 1			
Commence SFP Instrumentation Design	4Q12	Complete	
Commence SFP Instrumentation Procurement	2Q13	Complete	
Complete SFP Instrumentation Design	3Q14	Started	
SFP Instrumentation Delivery	2Q14	Started*	3Q14
Begin SFP Instrumentation Installation	4Q14	Not Started	
Commissioning of SFP Instrumentation	2Q15	Not Started	
NRC Order Implementation Date (based on the scheduled end of the second refueling outage after implementation plan submittal)	Spring 2015	Not Started	
BVPS Unit No. 2			
Commence SFP Instrumentation Design	4Q12	Complete	
Commence SFP Instrumentation Procurement	2Q13	Complete	
Complete SFP Instrumentation Design	1Q15	Started	
SFP Instrumentation Delivery	3Q14	Started	
Begin SFP Instrumentation Installation	2Q15	Not Started	
Commissioning of SFP Instrumentation	4Q15	Not Started	
NRC Order Implementation Date (based on the scheduled end of the second refueling outage after implementation plan submittal)	Fall 2015	Not Started	

*Instrumentation received at the plant; the support bracket is in fabrication and is scheduled for a 3Q14 delivery

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 represents the higher of the two points described in the NEI 12-02 guidance for this level.	Complete. (Provided in 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 backup 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	Started. (Provided in February 2014 status report with exception of 4b schematic. 4b schematic to be posted on ePortal).

Interim Staff Evaluation Open Item	Status
support the level sensor assembly.	
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.	Started. (Response to be 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 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 (i) the level sensor mounted in the SFP area, and (ii) 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. (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.	Started. (Response to be posted on ePortal.)
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.	Started. (Response to be posted on ePortal.)
RAI-9: Please provide the following: (a) A description of how the two channels of the proposed level measurement system meet this requirement so that the potential for a common cause event to adversely affect both channels is minimized to the extent pacticable. (b) Further information describing the design and installation of each level measurement system, consisting of level sensor electronics, cabling, and read-out devices. Please address how independence of these components of the primary and backup channels is achieved through the application of independent power sources, physical and spatial separation, independence of signals sent to the location(s) of the read-out devices, and the independence of the displays.	Complete. (Provided in February 2014 status report.)
RAI-10: Please provide the following: (a) A description of the electrical ac power sources and capabilities for the primary and backup channels. (b) Please provide the results of the calculation depicting the battery backup duty cycle requirements demonstrating that its capacity is	Started. (Provided RAI-10a response in February 2014 status report. Response to RAI-10b to be posted on

Interim Staff Evaluation Open Item	Status
sufficient to maintain the level indication function until offsite resource availability is reasonably assured.	ePortal.)
RAI-11: Please provide the following: (a) An estimate of the expected instrument channel accuracy performance (e.g., in percent of span) under both (i) normal SFP level conditions (approximately Level 1 or higher) and (ii) 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. (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.	Started. (Response to be posted on ePortal.)
RAI-12: Please provide the following: (a) A description of the capability and provisions the proposed level sensing equipment will have to enable periodic testing and calibration, including how this capability enables the equipment to be tested in-situ. (b) A description of how such testing and calibration will enable the conduct of regular channel checks of each independent channel against the other, and against any other permanently-installed SFP level instrumentation. (c) A description of how calibration tests and functional checks will be performed, and the frequency at which they will be conducted. Discuss how these surveillances will be incorporated into the plant surveillance program. (d) A description of what preventive maintenance tasks are required to be performed during normal operation, and the planned maximum surveillance interval that is necessary to ensure that the channels are fully conditioned to accurately and reliably perform their functions when needed.	Started. (Response to be posted on ePortal.)
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.	Started. (Response to be posted on ePortal.)
RAI-14: Please provide the following: (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. (b) Describe how the guidance in NEI 12-02, Section 4.3, regarding compensatory actions for one or both non-functioning channels will	Started. (Response to be posted on ePortal.)

Interim Staff Evaluation Open Item	Status
be addressed. (c) Describe what compensatory actions are planned in the event that one of the instrument channels cannot be restored to functional status within 90 days.	
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.	Started. (Response to be posted on ePortal.)

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. Beaver Valley Power Station, Units 1 and 2 – 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 November 19, 2013.

4. NRC Audits of Licensee Responses to Reliable Spent Fuel Pool Instrumentation Order EA-12-051, dated March 26, 2014.

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 January 31, 2014 and are current as of July 21, 2014.

- Update 2 was submitted.

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 following milestones are being modified as part of this update to reflect the number assigned in the interim staff evaluation (ISE) (Reference 3) to each request for additional information (RAI) and to update the action to post the RAI response on the ePortal by September 2015 as indicated in Reference 4.

Submit Six-Month Status Updates

- Update 3: August 2014
- 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: September 2015

The revised milestone target completion dates do not impact the order implementation date.

Milestone	Target Completion Date	Activity Status (as of 7/21/14)	Revised Target Completion Date
Submit Six-Month Status Updates			
Update 1	August 2013	Complete	
Update 2, including response to ISE RAI-1, RAI-2, RAI-3, RAI-4 (except 4b schematic), RAI-6, RAI-9, and RAI-10a	February 2014	Complete	
Update 3	August 2014	Started	
Update 4	February 2015	Not Started	
Update 5	August 2015	Not Started	
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	September 2015	Started	
Update 6	February 2016	Not Started	
Commence SFP Instrumentation Design	4Q12	Complete	
Commence SFP Instrumentation Procurement	2Q13	Complete	
Complete SFP Instrumentation Design	2Q15	Started	
SFP Instrumentation Delivery	4Q14	Started	
Begin SFP Instrumentation Installation	3Q15	Not Started	
Commissioning of SFP Instrumentation	2Q16	Not Started	
NRC Order Implementation Date (based on the scheduled end of the second refueling outage after implementation plan submittal)	Spring 2016	Not Started	

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 represents the higher of the two points described in the NEI 12-02	Complete. (Provided in February 2014 status

Interim Staff Evaluation Open Item	Status
guidance for this level.	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.	Started. (Provided in February 2014 status report with exception of 4b schematic. 4b schematic to be 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.	Started. (Response to be 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 conducted to provide assurance that the equipment will perform	Started. (Response to be posted on ePortal.)

Interim Staff Evaluation Open Item	Status
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. (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.	
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.	Started. (Response to be posted on ePortal.)
RAI-9: Please provide the following: (a) A description of the manner the two channels of the proposed level measurement system meet the independence requirement to minimize, to the extent pacticable, the potential for a common cause event to adversely affect both channels. (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.	Complete. (Provided in February 2014 status report.)
RAI-10: Please provide the following: (a) A description of the electrical ac power sources and capabilities for the primary and backup channels. (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.	Started. (Provided RAI-10a response in February 2014 status report. Response to RAI-10b to be posted on ePortal.)
RAI-11: Please provide the following: (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. (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.	Started. (Response to be posted on ePortal.)
RAI-12: Please provide the following: (a) A description of the capability and provisions the proposed level sensing equipment will have to enable periodic testing and	Started. (Response to be posted on ePortal.)

Interim Staff Evaluation Open Item	Status
calibration, including how this capability enables the equipment to be tested in-situ. (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. (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. (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.	
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.	Started. (Response to be posted on ePortal.)
RAI-14: Please provide the following: (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. (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. (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.	Started. (Response to be posted on ePortal.)
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.	Started. (Response to be posted on ePortal.)

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.

Perry Nuclear Power Plant Third Six-Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation

1 Introduction

FirstEnergy Nuclear Operating Company (FENOC) developed an Overall Integrated Plan (OIP) for Perry Nuclear Power Plant (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 January 31, 2014 and are current as of July 21, 2014.

- Update 2 was submitted.

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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 following milestones are being modified as part of this update to reflect the number assigned in the interim staff evaluation (ISE) (Reference 3) to each request for additional information (RAI) and to update the action to post the RAI response on the ePortal by September 2014 as indicated in Reference 4.

Submit Six-Month Status Updates

- Update 3: August 2014
- Post Response to ISE RAI-3b schematic, RAI-4, RAI-6, RAI-7, RAI-9b, RAI-10, RAI-11, RAI-12, RAI-13, and RAI-14 on ePortal: September 2014

The revised milestone target completion dates do not impact the order implementation date.

Milestone	Target Completion Date	Activity Status (as of 7/21/14)	Revised Target Completion Date
Submit Six-Month Status Updates			
Update 1	August 2013	Complete	
Update 2, including response to ISE RAI-1, RAI-2, RAI-3 (except 3b schematic), RAI-5, RAI-8, and RAI-9a	February 2014	Complete	
Update 3	August 2014	Started	
Post Response to ISE RAI-3b schematic, RAI-4, RAI-6, RAI-7, RAI-9b, RAI-10, RAI-11, RAI-12, RAI-13, and RAI-14 on ePortal	September 2014	Started	
Update 4	February 2015	Not Started	
Commence SFP Instrumentation Design	4Q12	Complete	
Commence SFP Instrumentation Procurement	2Q13	Complete	
Complete SFP Instrumentation Design	2Q14	Started	3Q14
SFP Instrumentation Delivery	2Q14	Started*	3Q14
Begin SFP Instrumentation Installation	3Q14	Not Started	4Q14
Commissioning of SFP Instrumentation	1Q15	Not Started	
NRC Order Implementation Date (based on the scheduled end of the second refueling outage after implementation plan submittal)	Spring 2015	Not Started	

*Instrumentation received at the plant; the support bracket is in fabrication and is scheduled for a 3Q14 delivery

4 Changes to Compliance Method

Level 2 was previously set as the indicated level on either the primary or backup instrument channel of greater than elevation (EL) 601' 4" plus the accuracy of the SFP LI channel, which was to be determined. This level was selected based on the Nuclear Energy Institute (NEI) 12-02, Revision 1, guidance for selecting the plant specific elevation for Level 2 given as 10 feet (+/- 1 foot) above the highest point of any fuel rack seated in the SFP. This level provides adequate radiation shielding for a person standing on the spent fuel pool operating deck from the fuel in the pool; however, the Perry Nuclear Power Plant SFP contains other materials capable of providing sufficient dose such that the pool deck would not be inhabitable should the materials be uncovered. To support the development of diverse and flexible coping strategies (FLEX) procedures, a site-specific radiation calculation was performed to determine a more appropriate Level 2 as it applies to FLEX mitigation strategies. As provided for in NEI 12-02, Revision 1, the calculation considered the emergency conditions that may apply at the time and the scope of necessary local operations, including installation of portable SFP instrument channel components. As a result, Level 2 has been re-established as EL 614' 6."

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 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-2: 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-3: 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.	Started. (Provided in February 2014 status report with exception of 3b. 3b schematic to be posted on ePortal.)
RAI-4: For RAI 3(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,	Started. (Response to be posted on ePortal.)

Interim Staff Evaluation Open Item	Status
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.	
RAI-5: For each of the mounting attachments required to attach SFP Level equipment to plant structures, please describe the design inputs, and the methodology that will be used to qualify the structural integrity of the affected structures/equipment.	Complete. (Provided in February 2014 status report.)
RAI-6: 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 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. (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.	Started. (Response to be posted on ePortal.)
RAI-7: For RAI 6 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.	Started. (Response to be posted on ePortal.)
RAI-8: Please provide the following: (a) A description of how the two channels of the proposed level measurement system meet this requirement so that the potential for a common cause event to adversely affect both channels is minimized to the extent pacticable. (b) Further information describing the design and installation of each level measurement system, consisting of level sensor electronics, cabling, and read-out 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.	Complete. (Provided in February 2014 status report.)
RAI-9: Please provide the following: (a) A description of the electrical ac power sources and capabilities for the primary and backup channels. (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.	Started. (Provided RAI-9a response in February 2014 status report. Response to RAI-9b to be posted on ePortal.)
RAI-10: Please provide the following: (a) An estimate of the expected instrument channel accuracy	Started. (Response to be posted on ePortal.)

Interim Staff Evaluation Open Item	Status
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. (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.	
RAI-11: Please provide the following: (a) A description of the capability and provisions the proposed level sensing equipment will have to enable periodic testing and calibration, including how this capability enables the equipment to be tested in-situ. (b) A description of how such testing and calibration will enable the conduct of regular channel checks of each independent channel against the other, and against any other permanently-installed SFP level instrumentation. (c) A description of how calibration tests and functional checks will be performed, and the frequency at which they will be conducted. Discuss how these surveillances will be incorporated into the plant surveillance program. (d) A description of the preventive maintenance tasks required to be performed during normal operation, and the planned maximum surveillance interval that is necessary to ensure that the channels are fully conditioned to accurately and reliably perform their functions when needed.	Started. (Response to be posted on ePortal.)
RAI-12: Please provide a list of the procedures addressing operation (both normal and abnormal response), calibration, test, maintenance, and inspection that will be developed for use of the spent SFP instrumentation. The licensee is requested to include a brief description of the specific technical objectives to be achieved within each procedure.	Started. (Response to be posted on ePortal.)
RAI-13: Please provide the following: (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 plans to ensure necessary channel checks, functional tests, periodic calibration, and maintenance will be conducted for the level measurement system and its supporting equipment. (b) A description of FENOC's procedure/process to implement the guidance in NEI 12-02 Section 4.3 on compensatory actions for one or both non-functioning channels. (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.	Started. (Response to be posted on ePortal.)

Interim Staff Evaluation Open Item	Status
RAI-14: 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.	Started. (Response to be posted on ePortal.)

7 Potential Interim Staff Evaluation Impacts

In Reference 3, the Nuclear Regulatory Commission (NRC) staff noted that FENOC planned to evaluate the potential dose rates associated with other material stored in the SFP and address any increased doses to personnel in the SFP area by alternative means, without changing the identified elevation for Level 2. As described in Section 4, Level 2 has been re-established as EL 614' 6."

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. NRC Order Number EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated March 12, 2012.

3. Perry Nuclear Power Plant, Unit 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.