Exelon Generation®

Order No. EA-12-051

RS-15-203
RA-15-066

August 28, 2015

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

Oyster Creek Nuclear Generating Station
Renewed Facility Operating License No. DPR-16
NRC Docket No. 50-219

Subject: Fifth 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)

References:

1. NRC Order Number EA-12-051, "Issuance of Order to Modify 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. Exelon Generation Company, LLC'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 25, 2012
5. Exelon Generation Company, LLC Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated February 28, 2013 (RS-13-033)
6. Exelon Generation Company, LLC First 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), dated August 28, 2013 (RS-13-124)
7. Exelon Generation Company, LLC Second 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), dated February 28, 2014 (RS-14-023)
8. Exelon Generation Company, LLC 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), dated August 28, 2014 (RS-14-201)

9. Exelon Generation Company, LLC Fourth 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), dated February 27, 2015 (RS-15-031)
10. NRC letter to Exelon Generation Company, LLC, Oyster Creek Nuclear Generating Station – 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 (TAC No. MF0823), dated November 8, 2013

On March 12, 2012, the Nuclear Regulatory Commission ("NRC" or "Commission") issued an order (Reference 1) to Exelon Generation Company, LLC (EGC). Reference 1 was immediately effective and directs EGC to install reliable spent fuel pool level instrumentation. 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 NEI 12-02, Revision 1 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided the EGC initial status report regarding reliable spent fuel pool instrumentation. Reference 5 provided the Oyster Creek Nuclear Generating Station overall integrated plan.

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. References 6, 7, 8, and 9 provided the first, second, third, and fourth six-month status reports, respectively, pursuant to Section IV, Condition C.2, of Reference 1 for Oyster Creek Nuclear Generating Station. The purpose of this letter is to provide the fifth 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 enclosed report provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any. The enclosed report also addresses the NRC Interim Staff Evaluation Request for Additional Information Items contained in Reference 10.

This letter contains no new regulatory commitments. If you have any questions regarding this report, please contact David P. Helker at 610-765-5525.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 28th day of August 2015.

Respectfully submitted,

James Barstow
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Enclosure:

1. Oyster Creek Nuclear Generating Station Fifth Six-Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation

cc: Director, Office of Nuclear Reactor Regulation
NRC Regional Administrator - Region I
NRC Senior Resident Inspector – Oyster Creek Nuclear Generating Station
NRC Project Manager, NRR – Oyster Creek Nuclear Generating Station
Ms. Jessica A. Kratchman, NRR/JLD/PMB, NRC
Mr. Stephen R. Monarque, NRR/JLD/JPMB, NRC
Mr. Robert L. Dennig, NRR/DSS/SCVB, NRC
Mr. John G. Lamb, NRR/DORL/LPL3-2, NRC
Mr. John D. Hughey, NRR/JLD/JOMB, NRC
Manager, Bureau of Nuclear Engineering – New Jersey Department of Environmental Protection
Mayor of Lacey Township, Forked River, NJ

Enclosure

Oyster Creek Nuclear Generating Station

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

(18 pages)

Oyster Creek Nuclear Generating Station

Fifth 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

Oyster Creek Nuclear Generating Station developed an Overall Integrated Plan (Reference 1 in Section 8), documenting the requirements to install reliable Spent Fuel Pool Level Instrumentation (SFPLI), in response to Reference 2. This enclosure provides an update of milestone accomplishments since submittal of the Fourth six month 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 has been completed since the development of the Fourth six month status report (Reference 9), and is current as of August 28, 2015.

- Begin Detailed Design Engineering

3 Milestone Schedule Status

The following provides an update to the milestone schedule to support the Overall Integrated Plan. 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.

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Submit 60 Day Status Report	October 25, 2012	Complete	
Submit Overall Integrated Plan	February 28, 2013	Complete	
Submit 6 Month Updates:			
Update 1	August 28, 2013	Complete	
Update 2	February 28, 2014	Complete	
Update 3	August 28, 2014	Complete	
Update 4	February 27, 2015	Complete	
Update 5	August 28, 2015	Complete with this submittal	
Update 6	February 28, 2016	Not Started	

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Update 7	August 28, 2016	Not Started	
Provide Final Safety Evaluation (SE) Info	April 30, 2016	Not Started	
Modifications:			
Conceptual Design	3Q2012	Complete	
Issue Exelon Fleet contract to procure SFPI Equipment	2Q2013	Complete	
Begin Detailed Design Engineering	1Q2015	Started	
Complete and Issue SFPI Modification Package	3Q2015	Not Started	
Begin Installation	2Q2016	Not Started	
Complete SFPI Installation and Put Into Service	3Q2016	Not Started	

4 Changes to Compliance Method

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

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

Oyster Creek Nuclear Generating Station expects to comply with the order implementation date and no relief/relaxation is required at this time.

6 Open Items from Overall Integrated Plan and Draft Safety Evaluation

The following tables provide a summary of the open items documented in the Overall Integrated Plan or the Draft Safety Evaluation (SE) and the status of each item.

Overall Integrated Plan Open Items		
OI#	**Description**	**Status**
1	Open Item: **Continuous level indication will**	Complete (Addressed in Reference 6)

	be provided by a guided wave radar system, submersible pressure transducer, or other appropriate level sensing technology that will be determined during the detailed engineering phase of the project.	
2 (RAI-1, Ref. 4)	RAI Question: **Please provide a clearly labeled sketch depicting the elevation view of the proposed typical mounting arrangement for the portions of 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.**	Started The required sketch is not available at this time. This information will be developed during the detailed design process. The SFPI system design completion and 100% acceptance of the design is scheduled for September 2015. The requested information will be provided in the February 2016, 6-month Integrated Plan update.
3 (RAI-2, Ref.4)	RAI Question: **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 the sensors toward the location of the read-out/display device.**	Started The required sketch is not available at this time. This information will be developed during the detailed design process. The SFPI system design completion and 100% acceptance of the design is scheduled for September 2015. The requested detail will be provided in the February 2016, 6-month Integrated Plan update.
4 (RAI-3,	RAI Question: **Please provide the following:** **a) The design criteria that will be**	Started a) Calculation CN-PEUS-15-08 prepared by Westinghouse provides the design criteria for

Ref.4)	**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.**	the loading on the mounting device(s), including static weight loads and dynamic loads. The design basis maximum seismic loads were based on the Bounding Curve and Bounding Tables provided in "Spent Fuel Pool Level Instrumentation Procurement Specification", 2013-BYR001. The hydrodynamic loads that could result from pool sloshing that could accompany such seismic forces were calculated using "United States Atomic Energy Commission, "Nuclear Reactors and Earthquakes", TID-7024, August 1963, Chapter 6, "Dynamic Pressure on Fluid Containers". This is an acceptable method per CC-AA-320-1001, Design Guide for the Dynamic Qualification of Equipment. Response for b, c: The level sensors will be attached to steel brackets mounted on the refueling floor via concrete anchors. Drawing 10067E58 prepared by Westinghouse shows the connection/mounting details. NOTE: The Calculation CN-PEUS-15-08 and Drawing 10067E58 preparation is in progress. These documents will be finalized at design completion and 100% acceptance of the design in September 2015. The requested detail will be provided in the February 2016, 6-month Integrated Plan update.
5 (RAI-4, Ref.4)	RAI Question: **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 beyond-design-basis (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**	Started This information will be developed during the detailed design process. The SFPI system design completion and 100% acceptance of the design is scheduled for September 2015. The requested detail will be provided in the February 2016, 6-month Integrated Plan update.

	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.**	
6 (RAI-5, Ref.4)	RAI Question: **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 practicable.** **b) Further information on how each level measurement system, consisting of level sensor electronics, cabling, and readout devices will be designed and installed to address independence through the application and selection of independent power sources, the use of physical and spatial separation, independence of signals sent to the location(s) of the readout devices, and the independence of the displays.**	Complete The two channels of the proposed level measurement system will be installed such that: a) The level probes will be mounted on the south side of the SFP and will be separated by a distance greater than the span of the shortest side of the pool. This meets the NEI 12-02, Revision 1 guidance for channel separation. b) One level transmitter for the primary and one for the backup instrument channels will be installed in each Cable Tray Bridge on elevation 80'. The electronics / UPS enclosure for the primary and backup instrument channels will be installed in the Upper Cable Spreading Room elevation 68'-6" with a physical separation of 8'. Physical and spatial separation of the primary and backup instrument channels is maintained by routing the associated instrument channel cables in separate raceways with a minimum separation of 1 feet. This meets the separation requirements for the installed location per OCGS Specification SP-9000-41-005, Cables & Raceways. The 120 VAC power to the primary instrument will be provided from safety related

		Post Accident Instrument Power Panel PDP-733-057. The 120VAC power to the backup level instrument will be provided from safety related Post Accident Instrument Power Panel PDP-733-058. The 120VAC distribution panels for the primary and backup instruments are powered by different 480V safety buses. Therefore, the loss of any one bus will not result in the loss of AC power to both instrument channels.
7 (RAI-6, Ref.4)	RAI Question: **Please provide the following: a) A description of the normal electrical AC power sources and capacities for the primary and backup channels. Describe how these AC sources are independent, and how they may be restored following an extended loss of AC event. b) If the level measurement channels are to be powered through a battery system (either directly or through an Uninterruptible Power Supply (UPS)), please provide the design criteria that will be applied to size the battery in a manner that ensures, with margin, that the channel will be available to run reliably and continuously following the onset of the BDB event for the minimum duration needed, consistent with the plant mitigation strategies for BDB external events (Order EA-12-049).**	Replaced by Interim SE RAI -9.
8 (RAI-7, Ref.4)	RAI Question: **Please provide the following: a) An estimate of the expected instrument channel accuracy performance 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**	Complete a) The Westinghouse documents WNA-CN-00301 and WNA-DS-02957-GEN describe the channel accuracy under both (a) normal SFP level condition and (b) at the Beyond Design Basis (BDB) condition that would be present if SFP level were at Level 2 and Level 3 datum points. Each instrument channel will be accurate to within ±3" during normal spent fuel pool level conditions. The instrument channels will retain this accuracy after BDB conditions, in accordance with the above Westinghouse

	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.**	documents. This value is within the channel accuracy requirements of the Order (±1 foot). b) The Westinghouse document WNA-TP-04709-GEN describes the methodology for routine testing/calibration verification and calibration methodology. This document also specifies the required accuracy criteria under normal operating conditions. Oyster Creek Station calibration and channel verification procedures will follow the guidance and criteria provided in this document. Instrument channel calibration will be performed if the level indication reflects a value that is outside the acceptance band established in the Oyster Creek Station calibration and channel verification procedures. Calibration will be performed once per refueling cycle for Oyster Creek Station. Per Westinghouse document WNA-TP-04709-GEN, calibration on a SFP level channel is to be completed within 60 days of a planned refueling outage considering normal testing scheduling allowances (e.g., 25%). This is in compliance with the NEI 12-02 guidance for Spent Fuel Pool Instrumentation.
9 (RAI-8, Ref.4)	RAI Question: **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 functional checks will be performed, and the frequency at which they will be conducted. Describe how calibration tests will be performed, and the**	<u>Started</u> a) During the detailed design phase, Westinghouse will provide the calibration procedure and functional test procedure describing the capabilities and provisions of SFPI periodic testing and calibration, including in-situ testing. Oyster Creek Station will review the procedures to ensure that the instrument can be calibrated, functionally tested, and in-situ tested per the Order requirements. b) The level displayed by the channels will be verified per the Oyster Creek Station administrative and operating procedures. If the level is not within the required accuracy per Westinghouse recommended tolerances, channel calibration will be performed. c) Functional checks will be performed per a future Westinghouse functionality test procedure at the Westinghouse recommended frequency. Calibration tests will be performed per a future Westinghouse

	frequency at which they will be conducted. Provide a discussion as to 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.**	calibration procedure at the Westinghouse recommended frequency. In accordance with Oyster Creek Station maintenance and operating programs, Oyster Creek Station will develop calibration, functional test, and channel verification procedures per Westinghouse recommendations to ensure reliable, accurate and continuous SFPI functionality. Periodic surveillance testing of the new components installed per this ECR will be determined by the cognizant system manager per CC-AA-102, Attachment 10B. d) Oyster Creek Station will develop preventive maintenance tasks for the SFPI per future Westinghouse recommendations to assure that the channels are fully conditioned to accurately and reliably perform their functions when needed. The planned completion for this item is November 2016.
10 (RAI-9, Ref.4)	RAI Question: **Please provide the following:** **a) The specific location for the primary and backup instrument channel displays.** **b) If the primary and backup displays are not located in the main control room, please provide a description of the selected location(s) for the primary and backup displays, including prompt accessibility to displays, primary and alternate route evaluation, habitability at display location(s), continual resource availability for personnel responsible to promptly read displays, and provisions for communications with decision makers for the various SFP drain down scenarios and external events.** **c) The reasons justifying why the locations selected will enable the information from these instruments to be**	Complete a) The Oyster Creek Station primary and backup instrument channel displays are located in the Upper Cable Spreading Room. Response for b) and c): The Oyster Creek Station primary and backup instrument channel displays are located on a floor above the control room accessible through a nearby stairwell. This location was selected due to the proximity to the main control room. Radiological habitability, humidity, and temperature at this location are considered habitable in Oyster Creek Station's Engineering Standard ES-027, "Environmental Parameters Oyster Creek NGS" and Calculation C-1302-822-5360-008, Rev 2, "Reactor Bldg Loss of Ventilation"; therefore, these locations are not considered a harsh environment. Estimated radiological conditions inside the Upper Cable Spreading Room for a core melt scenario, as well as estimated dose rates from SFP draindown conditions to Level 3 (Calculation BYR13-187), and exposure to personnel monitoring SFP levels, will remain less than emergency exposure limits allowable for

	considered "promptly accessible". Include consideration of various drain-down scenarios	emergency responders to perform this action. Heat and humidity from SFP boildown conditions have been evaluated for this location. The location is several elevations below the SFP operating floor and located in a different building physically separated by concrete walls from the SFP such that heat and humidity from a boiling SFP would not compromise habitability at this location. Spent Fuel Pool Level monitoring will be the responsibility of Operations personnel who will monitor the display periodically once dispatched from the Control Room. Travel time from the Control Room to the primary and secondary displays is approximately 2 minutes based on walkdowns. Radiological habitability, humidity, and temperature for the transit routes were considered habitable in Oyster Creek Station's Engineering Standard ES-027, "Environmental Parameters Oyster Creek NGS" and Calculation C-1302-822-5360-008, Rev 2, "Reactor Bldg Loss of Ventilation"; therefore, these locations are not considered a harsh environment to personnel monitoring the indications. The SFP levels will remain less than emergency exposure limits allowable for emergency responders to perform this action. Heat and humidity from SFP boildown conditions have been evaluated for access to this location, and the access routes are below the SFP operating floor and located in a different building physically separated by concrete walls from the SFP such that heat and humidity from a boiling SFP would not compromise habitability concerns with accessing these displays. Diverse communications are accessible at both display locations. The operators would first employ radio communications or telephone communication. If the radio communications or telephone systems are non-functional, the sound powered phone system is assumed available because no power is required. A sound powered phone jack is located in the Control Room; however, a sound powered phone jack is not located in the Upper Cable Spreading Room. The sound powered phone will be available to dispatch personnel for the monitoring of the indicators. The display will be accessed on demand. It takes up to 2 minutes to reach the display

		location, for both the primary and backup channels, when an operator is dispatched from the control room. The actual time for accessing the display locations is based on walkthroughs in the plant by the Operations, Engineering, and Maintenance personnel. The walkthrough to access the display locations is within the robust seismic category I structures, from the control room to the display locations, located in the Upper Cable Spreading Room.
11 (RAI-10, Ref.4)	RAI Question: **Please provide the following:** **a) A list of the operating (both normal and abnormal response) procedures, calibration/test procedures, maintenance procedures, and inspection procedures that will be developed for use of the SFP instrumentation in a manner that addresses the order requirements.** **b) A brief description of the specific technical objectives to be achieved within each procedure. If your plan incorporates the use of portable spent fuel level monitoring components, please include a description of the objectives to be achieved with regard to the storage location and provisions for installation of the portable components when needed.** **c) Describe how the replacement of an instrument channel component with a commercially available one that may not meet all of the qualifications noted in the OIP submittal would still be considered to be in compliance with the Order requirements. Which qualification provisions described in the OIP would not be followed?**	Replaced by Interim SE RAI -13.

12 (RAI-11, Ref.4)	RAI Question: **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. Please 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 how the guidance in NEI12-02, Section 4.3 regarding compensatory actions for one or both non-functioning channels will be addressed.** **c) A description of what compensatory actions are planned in the event that one of the instrument channels cannot be restored to functional status within 90 days.**	Complete Response for a: Performance tests (functional checks) and Operator performance checks will be described in detail in the vendor operator's manual, and the applicable information is planned to be contained in plant operating procedures. Operator performance tests are planned to be performed periodically as recommended by the equipment vendor. Channel functional tests per Operations Procedures, with limits established in consideration of vendor equipment specifications, are planned to be performed at appropriate frequencies established equivalent to or more frequently than existing SFPI. Manual calibration and operator performance checks are planned to be performed on a periodic scheduled basis, with additional maintenance on an as-needed basis when flagged by the system's automated diagnostic testing features. Channel calibration tests per maintenance procedures, with limits established in consideration of vendor equipment specifications, are planned to be performed at frequencies established in consideration of vendor recommendations. SFPI channel/equipment maintenance, preventative maintenance, and testing program requirements to ensure design and system readiness are planned to be established in accordance with Exelon's processes and procedures and in consideration of vendor recommendations to ensure that appropriate regular testing, channel checks, functional tests, periodic calibration, and maintenance is performed (and available for inspection and audit). Subject maintenance and testing program requirements are planned to be developed during the SFPI modification design process. Response for b, c: Both primary and backup SFPI channels incorporate permanent installation (with no reliance on portable, post-event installation) of relatively simple and robust augmented quality equipment. Permanent installation coupled with stocking of adequate spare parts reasonably diminishes the likelihood that a single channel

(and greatly diminishes the likelihood that both channels) is (are) out-of-service for an extended period of time. Planned compensatory actions for unlikely extended out-of-service events will be controlled by Procedure CC-OC-118-1001, Diverse and Flexible Coping Strategies (Flex) and Spent Fuel Pool Instrumentation Program Implementation, and are summarized as follows:

# Channel(s) Out-of-Service	**Required Restoration Action**	**Compensatory Action if Required Restoration Action not completed within Specified Time**
1	Restore Channel to functional status within 90 days (or if channel restoration not expected within 90 days, then proceed to Compensatory Action)	Immediately initiate action in accordance with note below
2	Initiate action within 24 hours to restore one channel to functional status and restore one channel to functional status within 72 hours.	Immediately initiate action in accordance with note below

		Note: Initiate an Issue Report to enter the condition into the Corrective Action Program. Identify the equipment out of service time is greater than the specified allowed out of service time, develop and implement an alternate method of monitoring, determine the cause of the non-functionality, and the plans and schedule for restoring the instrumentation channel(s) to functional status.

Draft Safety Evaluation Open Items		
OI#	**Description**	**Status**
1 (RAI -2, Ref. 5)	RAI Question: **Please provide additional information describing how the final arrangement of the SFP instrumentation and routing of the cabling between the level instruments, the electronics and the displays, meets the Order requirement to arrange the SFP level instrument channels in a manner that provides reasonable protection of the level indication function against missiles that may result from damage to the structure over the SFP.**	Complete The two sensors will be mounted in different locations of the SFP and separated by a distance comparable to the shortest side of the pool. The coaxial cables that extend from the two sensors toward the location of the transmitters (sensors electronics) will be installed using separate routes. The primary coaxial cable will be installed in conduit and the backup coaxial cable will be installed in cable tray. The Reactor Building and Cable Tray Bridges are seismic I structures and will remain operable during and after a beyond design basis event. The conduits and tray system (in which the coax cables are installed) will be separated in accordance with current plant licensing bases criteria for electrical separation as defined in OCGS Specification SP-9000-41-005, Cables & Raceways. The minimum separation between the coax cables from spent fuel pool to the transmitters is 8 feet. The 4-20mA cables that extend from the transmitters located in the Cable Tray Bridges to the electronics enclosure (display) located in the Upper Cable Spreading Room will be installed in seismic I structures, installed in separate conduits and will be routed separately with a minimum distance of 8 feet. The 120VAC power cables will be installed in a

		seismic I building, installed in separate conduits and routed separately with a minimum distance of 1 feet. This meets the separation requirements for the installed location per Oyster Creek Station Specification SP-9000-41-005, Cables & Raceways. All the equipment and supports will be seismically mounted.
2 (RAI -4, Ref. 5)	RAI Question: **For RAI 3(a) above, please provide 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 Calculation CN-PEUS-15-08 prepared by Westinghouse provides the design criteria for the loading on the mounting device(s), including static weight loads and dynamic loads. The design basis maximum seismic loads were based on the Bounding Curve and Bounding Tables provided in Spent Fuel Pool Level Instrumentation Procurement Specification, 2013-BYR001. The hydrodynamic loads that could result from pool sloshing that could accompany such seismic forces were calculated using United States Atomic Energy Commission, Nuclear Reactors and Earthquakes, TID-7024, August 1963, Chapter 6, "Dynamic Pressure on Fluid Containers." This is an acceptable method per CC-AA-320-1001, Design Guide for the Dynamic Qualification of Equipment. NOTE: Calculation CN-PEUS-15-08 preparation is in progress. This document will be finalized at design completion and 100% acceptance of the design in September 2015. The requested detail will be provided in the February 2016, 6-month Integrated Plan update.
3 (RAI -5, Ref. 5)	RAI Question: **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.**	Started The design inputs to qualify the structural integrity of the affected structures/equipment are based on AR Evaluations A2307026-02, A2307026-03, and equipment cut sheets from Westinghouse. The methodology to qualify the structural integrity of the affected structures/equipment is qualification by Analysis in accordance with CC-AA-320-1001, Design Guide for the Dynamic Qualification of Equipment. This information will be developed during the detailed design process. The SFPI system design completion and 100% acceptance of the design is scheduled for September 2015. The requested detail will be provided in the February 2016, 6-month Integrated Plan update.

4 (RAI -7, Ref. 5)	RAI Question: **For RAI 6 above, please provide the results for the selected methods, tests and analyses used to demonstrate the qualification and reliability of the installed equipment in accordance with the Order requirements.**	Started This information will be developed during the detailed design process. The SFPI system design completion and 100% acceptance of the design is scheduled for September 2015. The requested detail will be provided in the February 2016, 6-month Integrated Plan update.
5 (RAI -9, Ref. 5)	RAI Question: **Please provide the following:** **a) A description of the electrical ac power sources and capacities 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.**	Complete a) The primary SFPLI instrument channel will be normally powered from safety related 120VAC, Post Accident Instrument Panel PDP-733-57. The backup SFPLI instrument channel will be normally powered from the safety related 120VAC, Post Accident Instrument Panel PDP-733-58. These are on different safety buses, which maintains power source independence. Upon loss of normal AC power, individual batteries installed in each channel's electronics / UPS enclosure will automatically maintain continuous channel operation for at least 3 days. Before reaching the 3-day battery life, the Post Accident Instrument Panels will be restored using the FLEX diesel generator. Spatial and physical separation of the power cables will be maintained and complies with Oyster Creek Station Specification SP-9000-41-005, Cables & Raceways. The power cables will be routed in conduit approximately 1 foot apart and routed from the Control Room to the Upper Cable Spreading Room. b) Westinghouse Report, WNA-CN-00300-GEN, provides the results of the calculation depicting the battery backup duty cycle. This calculation demonstrates that battery capacity is 4.22 days to maintain the level indicating function to the display location, located in the Upper Cable Spreading Room elevation 63'-6". The results of the calculation meet the NEI 12-02 requirements.
6 (RAI -12, Ref. 5)	RAI Question: **Please provide the following:** **a) The specific location for the primary and backup**	Complete a) The Oyster Creek Station primary and backup instrument channel displays are located in the Upper Cable Spreading Room.

	instrument channel display. b) For any SFP level instrumentation displays located outside the main control room, please describe the evaluation used to validate that the display location can be accessed without unreasonable delay following a BDB event. Include the time available for personnel to access the display as credited in the evaluation, as well as the actual time (e.g., based on walk-throughs) that it will take for personnel to access the display. Additionally, please include a description of the radiological and environmental conditions on the paths personnel might take. Describe whether the display location remains habitable for radiological, heat and humidity, and other environmental conditions following a BDB event. Describe whether personnel are continuously stationed at the display or monitor the display periodically.	Response for b): The Oyster Creek Station primary and backup instrument channel displays are located on elevation 63'-6", the floor above the control room. The Upper Cable Spreading Room is accessible through two doors and a staircase. This location was selected due to proximity to the main control room. The Upper Cable Spreading Room is not applicable in Engineering Standard ES-027, "Environmental Parameters Oyster Creek NGS"; therefore, the radiological habitability at this location will remain less than emergency exposure limits allowable for emergency responders to perform this action. Heat and humidity from SFP boildown conditions have been evaluated for this location. The location is at an elevation several floors below the SFP operating floor and located in a different building physically separated by concrete walls, such that heat and humidity from a boiling SFP would not compromise habitability at this location. Spent Fuel Pool Level monitoring will be the responsibility of Operations personnel who will monitor the display periodically once dispatched from the Control Room. Travel time from the Control Room to the primary and secondary displays is approximately 2 minutes based on walkdowns. Radiological habitability for the transit routes to both displays is not available in Engineering Standard ES-027, "Environmental Parameters Oyster Creek NGS"; therefore, the radiological habitability at this location will remain less than emergency exposure limits allowable for emergency responders to perform this action. Heat and humidity from SFP boildown conditions have been evaluated for access to this location, and the access routes are below the SFP operating floor and located in a different building such that heat and humidity from a boiling SFP would not compromise habitability concerns with accessing these displays. Diverse communications are accessible at both display locations. The operators would employ radio communications or the telephone communication. If the radio communications or telephone systems are nonfunctional, the sound powered phone system is assumed available because no power is required. A sound powered phone jack is located in the Control Room; however, a sound powered phone jack is not located in the Upper Cable Spreading Room. The sound powered phone will be available to dispatch personnel for the monitoring of the indicators. The display will be accessed on demand. It takes up to 2 minutes to reach the display location, for both the primary and backup channels, when an operator is

		dispatched from the control room. The actual time for accessing the display locations is based on a walkthrough from the Control Room to the Upper Cable Spreading Room. The walkthrough to access the display locations is within the robust seismic category I structures, from the control room to the display locations, located in the Upper Cable Spreading Room. Upon obtaining the indicated SFP level from the display location, the operators will use the radio communication system to provide the information to the control room immediately.
7 (RAI -13, Ref. 5)	RAI Question: **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.**	Complete Appropriate quality measures will be selected for the SFPIS required by Order EA-12-051, consistent with Appendix A of NEI 12-02. Site procedures will be developed for system inspection, calibration and test, maintenance, repair, operation and normal and abnormal responses, in accordance with Exelon's procedure control process. Technical objectives to be achieved in each of the respective procedures are described below: Procedure Objectives to be achieved: 1. System Inspection: To verify that system components are in place, complete, and in the correct configuration, and that the sensor probe is free of significant deposits. 2. Calibration and Test: To verify that the system is within the specified accuracy, is functioning as designed, and is appropriately indicating SFP water level. 3. Maintenance: To establish and define scheduled and preventive maintenance requirements and activities necessary to minimize the possibility of system interruption. 4. Repair: To specify troubleshooting steps and component repair and replacement activities in the event of system malfunction. 5. Operation: to provide sufficient instructions for operation and use of the system by plant operation staff. 6. Responses: To define the actions to be taken upon observation of system level indications, including actions to be taken at the levels defined in NEI 12-02.

7 Potential Draft Safety Evaluation Impacts

There are no potential impacts to the Draft Safety Evaluation identified at this time.

8 References

The following references support the updates to the Overall Integrated Plan described in this enclosure.

1. Oyster Creek Nuclear Generating Station, "Overall Integrated Plan 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 February 28, 2013 (RS-13- 033)
2. NRC Order Number EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012
3. USNRC letter to Exelon Generation Company, LLC, Request for Additional Information Regarding Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation, dated August 28, 2013
4. Exelon Generation Company, LLC, letter to USNRC, "Response to Request for Additional Information – Overall Integrated Plan in Response to Commission Order Modifying License Requirements for Reliable Spent Fuel Pool Instrumentation (Order No. EA-12-051)", dated September 18, 2013 (RS-13-212)
5. USNRC letter to Exelon Generation Company, LLC, "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 8, 2013
6. First Six-Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated August 28, 2013 (RS-13-124)
7. Second Six Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated Feburary 28, 2014 (RS-14-023)
8. Third Six Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated August 28, 2014 (RS-14-201)
9. Fourth Six Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated Feburary 27, 2015 (RS-15-031)
10. C-1302-822-5360-008, Rev 2, "Reactor Bldg Loss of Ventilation"
11. ES-027, Rev 004, "Environmental Parameters Oyster Creek NGS"