

Order No. EA-12-051

RS-14-019

February 28, 2014

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

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: 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)

#### 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
- 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
- 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
- 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
- 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-13-029)
- 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-13-116)
- 7. NRC letter to Exelon Generation Company, LLC, Clinton Power Station, 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 (TAC Nos. MF0791), dated November 15, 2013

U.S. Nuclear Regulatory Commission Integrated Plan Report to EA-12-051 February 28, 2014 Page 2

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 Clinton Power Station, Unit 1 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. Reference 6 provides the first six-month status report pursuant to Section IV, Condition C.2, of Reference 1 for Clinton Power Station. The purpose of this letter is to provide the second 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 7.

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 28<sup>th</sup> day of February 2014.

Respectfully submitted,

Glen T. Kaegi

Director - Licensing & Regulatory Affairs

Exelon Generation Company, LLC

### Enclosure:

1. Clinton Power Station, Unit 1 Second Six-Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation

### **Enclosure**

### Clinton Power Station, Unit 1

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

(14 pages)

### Clinton Power Station, Unit 1

Second 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

Clinton Power Station, Unit 1, (CPS) 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 First 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 milestones have been completed since the development of the First six month status report (Reference 6), and are current as of February 28, 2014.

- Commenced procurement of equipment
- Began detailed design engineering of the SFPLI for Clinton Power Station

### 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.

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

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 Responses to RAIs	July 5, 2013	Complete	
Submit 6 Month Updates:			
Update 1	August 28, 2013	Complete	
Update 2	February 28, 2014	Complete with this submittal	
Update 3	August 28, 2014	Not Started	

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Provide Final Safety Evaluation (SE) Info	September 30, 2014	Not Started	
Modifications:			
Conceptual Design	3Q2012	Complete	
Issue Exelon Fleet contract to procure SFPI Equipment	2Q2013	Complete	
Begin Detailed Engineering Design	4Q2013	Complete	
Complete and Issue SFPI Modification Package	2Q2014	Started	3Q2014
Begin Installation	1Q2015	Not Started	
Complete SFPI Installation and Put Into Service	2Q2015	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

CPS 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 Interim Safety Evaluation (ISE) and the status of each item.

Overall Integrated Plan Open Items			
OI#	Description	Status	-
1	Open Item:	Complete.	Militaria di Spesifica Aperatura
(Ref.1)	Continuous level indication will 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.	
1	RAI Question:	Complete
(RAI-1, Ref.4)	a) For Level 1, specify how the identified location represents the higher of the two points described in the NEI 12-02 guidance for this level.	(Addressed in Reference 4)
	b) 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.	
2 (RAI-2, Ref.4)	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.  Note that the start date for the design has changed from November 2013 to December 2013 and completion date for design has changed from June 2014 to September 2014; however, all required information for Final SE will be provided in accordance with the Interim SE date for Clinton by September 30, 2014.
	RESPONSE:	
	Final sensor locations and cable routings are not available at this time. This information will be developed during the detailed design process. The	

	design of the SFPI system based on the current Exelon Nuclear program schedule for Clinton Power Station is to begin the design phase in December 2013 with design completion and 100% acceptance of the design in September 2014. The requested information will be provided by September 30, 2014 in accordance with the Interim SE date.	
3	RAI Question:	Started.
(RAI-3, Ref.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.  RESPONSE:  Mounting device total loading and	Note that the start date for the design has changed from November 2013 to December 2013 and completion date for design has changed from June 2014 to September 2014; however, all required information for Final SE will be provided in accordance with the Interim SE date for Clinton by September 30, 2014.
	attachments are not available at this time. This information will be developed	
	during the detailed design process. The	
	current plan for the design of the SFPI system based on the current Exelon	
	Nuclear program schedule for Clinton Power Station is to begin the design	

	phase in December 2013 with design completion and 100% acceptance of the design in September 2014. The requested information will be provided by September 30, 2014 in accordance with the Interim SE date.	
4 (RAI-4, Ref.4)	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 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 readout 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. RESPONSE:	Note that the start date for the design has changed from November 2013 to December 2013 and completion date for design has changed from June 2014 to September 2014; however, all required information for Final SE will be provided in accordance with the Interim SE date for Clinton by September 30, 2014.
	Equipment reliability qualification information is not available at this time. This information will be developed during the detailed design process. The current plan for the design of the SFPI system based on the current Exelon	

# Clinton Power Station, Unit 1 Second Six-Month Status Report for the Implementation of SFP LI February 28, 2014 ear program schedule for Clinton

	Nuclear program schedule for Clinton Power Station is to begin the design phase in December 2013 with design completion and 100% acceptance of the design in September 2014. The requested information will be provided by September 30, 2014 in accordance with the Interim SE date.	
5	RAI Question:	Started.
(RAI-5, Ref.4)	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.  RESPONSE:  Channel independence information is not available at this time. This information will be developed during the detailed design process. The current plan for the design of the SFPI system based on the current Exelon Nuclear	Note that the start date for the design has changed from November 2013 to December 2013 and completion date for design has changed from June 2014 to September 2014; however, all required information for Final SE will be provided in accordance with the Interim SE date for Clinton by September 30, 2014.
	program schedule for Clinton Power Station is to begin the design phase in December 2013 with design completion and 100% acceptance of the design in September 2014. The requested information will be provided by September 30, 2014 in accordance with the Interim SE date.	
6	RAI Question:	Replaced by Interim SE RAI #8
(RAI-6, Ref.4)	Please provide the following:  a) A description of the electrical AC power sources and capacities for the	Note that the start date for the design has changed from November 2013 to

primary and backup channels. 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).

December 2013 and completion date for design has changed from June 2014 to September 2014; however, all required information for Final SE will be provided in accordance with the Interim SE date for Clinton by September 30, 2014.

**RESPONSE**: Equipment total power supply configuration and characteristics are not available at this time. This information will be developed during the detailed design process. The current plan for the design of the SFPI system based on the current Exelon Nuclear program schedule for Clinton Power Station is to begin the design phase in December 2013 with design completion and 100% acceptance of the design in September 2014. The requested information will be provided by September 30, 2014 in accordance with the Interim SF date

#### 7 **RAI Question:**

### (RAI-7, Ref.4)

Please provide the following: a) An estimate of the expected instrument channel accuracy performance 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

#### Started.

Note that the start date for the design has changed from November 2013 to December 2013 and completion date for design has changed from June 2014 to September 2014; however, all required information for Final SE will be provided in accordance with the Interim SE date for Clinton by September 30, 2014.

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.

RESPONSE:

Channel accuracy information is not available at this time. This information will be developed during the detailed design process. The current plan for the design of the SFPI system based on the current Exelon Nuclear program schedule for Clinton Power Station is to begin the design phase in December 2013 with design completion and 100% acceptance of the design in September 2014. The requested information will be provided by September 30, 2014 in accordance with the Interim SE date.

### 8 RAI Question:

### (RAI-8, Ref.4)

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 frequency at which they will be conducted. Provide a discussion as to how these surveillances will be incorporated into the plant surveillance program.

#### Started.

Note that the start date for the design has changed from November 2013 to December 2013 and completion date for design has changed from June 2014 to September 2014; however, all required information for Final SE will be provided in accordance with the Interim SE date for Clinton by September 30, 2014.

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.

RESPONSE:

Equipment testing, calibration, functional checks and maintenance requirements are not available at this time. This information will be established during process and procedure development following the detailed design phase. The current plan for the design of the SFPI system based on the current Exelon Nuclear program schedule for Clinton Power Station is to begin the design phase in December 2013 with design completion and 100% acceptance of the design in September 2014. Procedures will start being developed, early in the process, in parallel with the design efforts. The requested information will be provided by September 30, 2014 in accordance with the Interim SE date.

### 9 RAI Question:

### (RAI-9, Ref.4)

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

### Replaced by Interim SE RAI #11

Note that the start date for the design has changed from November 2013 to December 2013 and completion date for design has changed from June 2014 to September 2014; however, all required information for Final SE will be provided in accordance with the Interim SE date for Clinton by September 30, 2014.

drain down scenarios and external events.

c) The reasons justifying why the

locations selected will enable the information from these instruments to be considered "promptly accessible" to various drain-down scenarios and external events. RESPONSE: Channel display location information is not available at this time. This information will be developed during the detailed design process. The current plan for the design of the SFPI system based on the current Exelon Nuclear program schedule for Clinton Power Station is to begin the design phase in December 2013 with design completion and 100% acceptance of the design in September 2014. The requested information will be provided by September 30, 2014 in accordance with the Interim SE date.

### 10 RAI Question:

### (RAI-10, Ref.4)

Please provide a description of the standards, guidelines and/or criteria that will be utilized to develop procedures for inspection, maintenance, repair, operation, abnormal response, and administrative controls associated with the SFP level instrumentation, as well as storage and installation of portable instruments.

RESPONSE: Procedural details are not available at this time. This information will be established during process and procedure development following the detailed design phase. The current plan for the design of the SFPI system based on the current Exelon Nuclear program schedule for Clinton Power Station is to begin the design phase in December 2013 with design completion and 100% acceptance of the design in September 2014. Procedures will start

### Replaced by Interim SE RAI #12

Note that the start date for the design has changed from November 2013 to December 2013 and completion date for design has changed from June 2014 to September 2014; however, all required information for Final SE will be provided in accordance with the Interim SE date for Clinton by September 30, 2014.

	being developed, early in the process, in parallel with the design efforts. The requested information will be provided by September 30, 2014 in accordance with the Interim SE date.	
11	RAI Question:	Started.
(RAI-11, Ref.4)	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.  RESPONSE:	Note that the start date for the design has changed from November 2013 to December 2013 and completion date for design has changed from June 2014 to September 2014; however, all required information for Final SE will be provided in accordance with the Interim SE date for Clinton by September 30, 2014.
	Testing and calibration program requirements and compensatory actions are not available at this time. This information will be established during process and procedure development following the detailed design phase. The current plan for the design of the SFPI system based on the current Exelon Nuclear program schedule for Clinton Power Station is to begin the design phase in December 2013 with design completion and 100% acceptance of the design in September	

developed,	edures will start being early in the process, in the design efforts. The	
requested in by Septemb	oformation will be provided er 30, 2014 in accordance frim SE date.	

	Interim Safety Evaluation Open Items		
OI#	Description	Status	
1	RAI Question:	Not Started.	
(RAI-3, Ref. 5)	For RAI 2(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.		
2	RAI Question:	Not Started.	
(RAI-4, Ref. 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 was used to qualify the structural integrity of the affected structures/equipment.		
3	RAI Question:	Not Started.	
(RAI-6, Ref. 5)	For RAI #5 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.		
4	RAI Question:	Not Started.	
(RAI-8, Ref. 5)	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.		

f	Tebluary 20, 2014	
5	RAI Question:	Not Started.
(RAI-11 Ref. 5)	Please provide the following:  a) The specific location for the primary and backup instrument channel display.  b) If a display will be located somewhere other than the control room or alternate shutdown panel, 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 walkthroughs) 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.	
6 (RAI-12 Ref. 5)	RAI Question:	Not Started.

Note: RAIs not included in the Interim Staff Evaluation Open Items Table are duplicate to the RAIs in Reference 3 and are listed in the Overall Integrated Plan Open Item Table.

### 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.

- Exelon Generation Company, LLC, letter to USNRC, "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-13-029)
- 2. NRC Order Number EA-12-051, "Issuance of 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 June 7, 2013.
- 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 July 3, 2013 (RS-13-157).
- 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 15, 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-13-116).