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NRC Order No. EA-12-051

FLL-14-032

August 26, 2014

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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Rockville, MD 20852

R. E. Ginna Nuclear Power Plant
Renewed Facility Operating License No. DPR-18
Docket No. 50-244

Subject: August 2014 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)

Reference: (1) NRC Order Number EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated March 12, 2012 (ML12054A679)

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-051 (Reference 1) to Constellation Energy Nuclear Group, LLC (CENG) for R.E. Ginna Nuclear Power Plant, LLC (Ginna). Reference (1) requires submission of a status report at six-month intervals following submittal of the overall integrated plan. Attachment (1) provides the third Six-Month Status Report for Ginna pursuant to Section IV, Condition C.2, of Reference (1). This report updates the milestone accomplishments since the submittal of the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any.

There are no regulatory commitments contained in this letter.

If there are any questions regarding this letter, please contact Bruce Montgomery, Acting Manager - Licensing, at 443-532-6533.

A001
NRR

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 26th day of August, 2014.

Respectfully,

Mary G. Korsnick

MGK/STD

Attachment (1) Six-Month Status Report (August 2014) for Reliable Spent Fuel Pool Instrumentation

cc: Regional Administrator, Region I, USNRC
NRC Project Manager, NRR – R. E. Ginna Nuclear Power Plant
NRC Senior Resident Inspector – R. E. Ginna Nuclear Power Plant
Director, Office of Nuclear Reactor Regulation

bcc: M. G. Korsnick
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COMMITMENTS IDENTIFIED IN THIS CORRESPONDENCE:	
None	
Responsible Person/Organization:	**NA**
Due Date:	**NA**
SAR/TSB Revision Required? No	**No**
NL No.:	**NA**

Posting Requirements for Responses -- NOV/Order No

ATTACHMENT (1)

SIX-MONTH STATUS REPORT (AUGUST 2014)

FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION

R. E. GINNA NUCLEAR POWER PLANT, LLC
August 26, 2014

R. E. Ginna 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

R. E. Ginna Nuclear Power Plant, LLC (Ginna) 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 Second 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 Second Six-Month status report (Reference 3), and are current as of August 1, 2014.

- Completed Site Acceptance Testing

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 26, 2012	Complete	
Submit Overall Integrated Plan	February 28, 2013	Complete	
Submit Responses to RAIs	September 23, 2013	Complete	
Submit 6 Month Updates:			
Update 1	August 27, 2013	Complete	
Update 2	February 24, 2014	Complete	
Update 3	August 28, 2014	Complete with this submittal	
Provide Final Safety Evaluation (SE) Information	September 30, 2014	Started	

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Modifications:			
Commence Engineering and Design	1Q2014	Complete	3Q2013
Complete Engineering and Design	2Q2014	Complete	4Q2013
Receipt of SFP Instruments	1Q2015	Complete	1Q2014
Commence Installation of SFP Instruments	1Q2015	Started	4Q2014
Close out Project/Plant Turnover	2Q2015	Started	

4 Changes to Compliance Method

No changes to the compliance methodology have occurred since the February 2014 status report (Reference 3).

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

Ginna 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

As noted in the memorandum from C. A. Hunt (NRC) to M. A. Mitchell (NRC), Summary of the November 26, 2013 Public Meeting to Discuss Industry Responses to Staff Interim Evaluations for Spent Fuel Pool Instrumentation (Reference 4), the ISE questions supersede any previous requests for information issued by the staff concerning the spent fuel pool instrumentation. The following table provides a summary of the open items documented in the Draft Safety Evaluation (SE) and the status of each item.

Draft Safety Evaluation Open Items		
OI#	**Description**	**Status**
1 (RAI-1, Ref. 5)	RAI Question: **Please provide additional information describing how the proposed arrangement**	Complete. (Addressed in Reference 3)

	of the waveguides and routing of the cabling between the radar horns and the electronics in the Intermediate Floor (Elevation 253 ft. 0 in.) 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.	
2 (RAI-2, Ref. 5)	RAI Question: **Please provide the analyses verifying the seismic testing of the horn and waveguide assembly and the electronics units, and the analysis of the combined maximum seismic and hydrodynamic forces on the cantilevered portion of the assembly exposed to the potential sloshing effects. Show the SFP instrument design configuration will be maintained during and following the maximum seismic ground motion considered in the design of the SFP structure.**	Started.
3 (RAI-3, Ref. 5)	RAI Question: **For each of the mounting attachments required to attach SFP Level equipment to**	Complete. (Addressed in Reference 3)

	plant structures, please describe the design inputs, and the methodology that will be used to qualify the structural integrity of the affected structures/ equipment.	
4 (RAI-4, Ref. 5)	RAI Question: **Please provide analysis of the maximum expected radiological conditions (dose rate and total integrated dose) to which the equipment will be exposed. Also, please provide documentation indicating how it was determined that the electronics for this equipment are capable of withstanding a total integrated dose of $1x10^3$ Rads. Please discuss the time period over which the analyzed total integrated dose was applied.**	Complete. (Addressed in Reference 3)
5 (RAI-5, Ref. 5)	RAI Question: **Please provide information indicating (a) whether the 80^0C rating for the sensor electronics is a continuous duty rating; and, (b) the maximum expected ambient temperature in the room in which the sensor electronics will be located under Beyond Design Basis (BDB) conditions with no ac power available to run Heating Ventilation and Air**	Started.

	Conditioning (HVAC) systems.	
6 (RAI-6, Ref. 5)	RAI Question: **Please provide information indicating the maximum expected relative humidity in the room in which the sensor electronics will be located under BDB conditions, with no ac power available to run HVAC systems, and whether the sensor electronics are capable of continuously performing their required functions under this expected humidity condition.**	Started.
7 (RAI-7, Ref. 5)	RAI Question: **Please provide information describing the evaluation of the comparative sensor design, the shock test method, test results, and forces applied to the sensor applicable to its successful tests, demonstrating the referenced previous testing provides an appropriate means to demonstrate reliability of the sensor under the effects of severe shock.**	Complete. (Addressed in Reference 3)
8 (RAI-8, Ref. 5)	RAI Question: **Please provide information describing the evaluation of the comparative sensor design, the vibration test method, test results, and the forces and their frequency**	Complete. (Addressed in Reference 3)

	ranges and directions applied to the sensor applicable to its successful tests, demonstrating the referenced previous testing provides an appropriate means to demonstrate reliability of the sensor under the effects of high vibration.	
9 (RAI-9, Ref. 5)	RAI Question: **Please provide information describing the evaluation of the comparative display panel ratings against postulated plant conditions. Also provide results of the manufacturer's shock and vibration test methods, test results, and the forces and their frequency ranges and directions applied to the display panel associated with its successful tests.**	Complete. (Addressed in Reference 3)
10 (RAI-10, Ref. 5)	RAI Question: **Please provide the results of seismic testing for shock and vibration effects to demonstrate the reliability of the components within the power and control panel under shock and vibration conditions.**	Complete. (Addressed in Reference 3)
11 (RAI-11, Ref. 5)	RAI Question: **Please provide analysis of the seismic testing results and show that the instrument performance reliability,**	Complete. (Addressed in Reference 3)

	following exposure to simulated seismic conditions representative of the environment anticipated for the SFP structures at Ginna, has been adequately demonstrated.	
12 (RAI-12, Ref. 5)	RAI Question: **Please provide the NRC staff with the final configuration of the power supply source for each channel so the staff may conclude the two channels are independent from a power supply assignment perspective.**	Complete. (Addressed in Reference 3)
13 (RAI-13, Ref. 5)	RAI Question: **Please provide the results of the calculation depicting the battery backup duty cycle requirements, demonstrating battery capacity is sufficient to maintain the level indication function until offsite resource availability is reasonably assured.**	Complete. (Addressed in Reference 3)
14 (RAI-14, Ref. 5)	RAI Question: **Please provide the analysis verifying proposed instrument performance is consistent with these estimated accuracy normal and BDB values. Please demonstrate the channels will retain these accuracy performance values**	Complete. The instrument accuracy at normal and BDB conditions was verified by testing of the actual waveguide configuration during the vendor factory acceptance testing. The vendor factory acceptance test demonstrated reliable operation of the SFP level instrumentation under normal conditions and under various simulated BDB test conditions (e.g. steam exposure). Normal conditions testing included multi-point checks of accuracy at room temperature and humidity using a metal target. BDB conditions were simulated by injecting steam and water into the waveguide pipe and checking the indicated values. All

	following a loss of power and subsequent restoration of power.	results were within the estimated accuracy normal and BDB values. The testing demonstrated the instrumentation met design accuracy and repeatability specifications (Reference 6). The accuracy performance values were also verified after a loss of power and subsequent restoration of power. FAT and Site Acceptance Testing (SAT) (Reference 7) verified that on a loss of the normal AC power supply that is expected to occur during an ELAP, power is automatically transferred to a battery backup within each of the primary and backup SFP LI power control panels and accuracy remains satisfactory.
15 (RAI-15, Ref. 5)	RAI Question: **Please describe the evaluation used to validate that the display locations can be accessed without unreasonable delay following a BDB event. Include the time available for personnel to access the display location as credited in the evaluation, as well as the actual time (e.g., based on walk-through) that it will take for personnel to access the display locations. Additionally, please include a description of the radiological and environmental conditions on the paths personnel might take. Describe whether the display locations remain habitable for radiological, heat and humidity, and other environmental conditions following a BDB event. Describe whether personnel are continuously stationed at the display locations or monitor the displays**	Complete. NRC Order EA-12-051 (Reference 2), JLD-ISG-2012-03 (Reference 8), and NEI 12-02 guidance (Reference 9) do not explicitly require a formal evaluation to determine the required time for personnel to access the SFP level display. NEI 12-02 Section 3.1 allows reliance on portable SFP level instrumentation for the back-up channel, provided two trained personnel can deploy the instrument within 30 minutes. Personnel access to the Ginna primary and back-up SFP level channels can readily be achieved within this timeframe during a postulated BDB/ELAP event. Depending on the specific BDB event, personnel will be dispatched to the SFP level display location in the Standby Auxiliary Feedwater Building (SAFWB) to establish Standby Auxiliary Feedwater Flow to the Steam Generators within 25 minutes of the initiating event. Once the priority of establishing core cooling is achieved, personnel can then monitor SFP level on an intermittent basis to provide SFP level indication information to the Control Room Operators. As discussed in the Maintain SFP Cooling strategy in the Ginna Overall Integrated Plan for Mitigation Strategies for Beyond-Design-Basis External Events (Reference 10), in the most limiting circumstances, SFP boiling does not occur for 5 hours. There is significant margin to determine SFP level before it is be necessary to take mitigating actions. An access pathway to the SAFWB (among multiple available pathways) is expected to remain available following a seismic or tornado missile event. In slowly developing BDB events, personnel can be pre-staged at the SFP level display location. SFP level display access times are based on engineering/operations judgment.

	periodically.	The timeline will be validated for compliance with Order EA-12-049 (Reference 11) after the Standby Auxiliary Feedwater Building modification is completed. During a postulated BDB event, only periodic personnel monitoring of SFP level is required. The SAFWB environment is not affected by the environmental conditions associated with any SFP drain down scenario. Radio communications between personnel at the SFP level display and the Control Room will used to keep Operations informed of SFP level. SFP level indication is considered to be readily accessible during an ELAP as defined by NEI 12-02 based on the following considerations: a) The travel path to the SFP level displays from the Control Room is via the Turbine Building Operating or Intermediate floors, through the Turbine Building or Technical Support Center, and then outside to the SAFWB. The travel path is not exposed to potentially adverse SFP area conditions. Radiological or environmental conditions through the travel path will be consistent with operating conditions for maximum temperature and humidity, or be subject to expected low temperature conditions. Travel path and SFP level display area dose-rates are not anticipated to increase during the event. In the case of BDB floods, pre-staging personnel in the SAFWB will negate any travel path issues. b) Design criteria for the new SAFWB will ensure that the area remains habitable for heat and humidity conditions following a BDB event.
16 (RAI-16, Ref. 5)	RAI Question: **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 SFP instrumentation. The licensee is requested to include a brief description of the specific technical**	Complete. A complete 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 has not been finalized yet. The following procedures have been revised, developed, or will be developed in support of the SFP LI system: a) O-6.1, Auxiliary Operator Rounds and Log Sheets (Reference 12) ➢ Provides on-shift operators and, in particular, Auxiliary Operators, the controls necessary to perform rounds and report abnormal/unusual conditions to ensure that the plant operates safely and efficiently for all modes. b) ER-SFP.2, Diverse SFP Makeup and Spray

	objectives to be achieved within each procedure.	(Reference 13) ➢ Provides the internal and external strategy for establishing a diverse means of SFP makeup for at least 12 hours without offsite supplies and provides a list of materials available for leak mitigation. c) FSG-11, Alternate SFP Makeup and Cooling (TBD) ➢ Provides actions to restore SFP level using an alternate makeup source. d) CPI-LVL-310, Calibration of SFP Level Northeast Channel Loop LT-310 (Reference 14) ➢ Provides instructions for Calibration check of Spent Fuel Pool Level Channel LT-310 Instrumentation. e) CPI-LVL-311, Calibration of SFP Level Northeast Channel Loop LT-311 (Reference 15) ➢ Provides instructions for Calibration check of Spent Fuel Pool Level Channel LT-311 Instrumentation. f) TBD ➢ Describes compensatory actions when both channels are out of service and expedited and compensatory actions when one of the instrument channels cannot be restored to functional status within 90 days.
17 (RAI-17, Ref. 5)	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 the**	Complete. a. Programmatic controls will be established to ensure the performance of periodic performance checks of the SFP level transmitters and indications, calibration of loop power supplies and current repeaters/isolators, and verification of computer response. Procedures CPI-LVL-310 and CPI-LVL-311 provide the instructions for calibration checks of SFP Level Instrumentation Channels LT-310 and LT-311 respectively. Procedure O-6.1 directs the Outside Operator to log LI-310 and LI-311 SFP Wide Range Levels once per twelve hour shift. Minimum and Maximum SFP Level values are identified for operator action in O-6.1. The Plant Process Computer System has alarms to notify Control Room Operators when levels indicate off-normal values. The maintenance, testing and calibration program has been established, or will be established, that contains the elements listed below: ➢ Calibration procedures that are based on the vendor provided instruction manuals and calibration procedures for the equipment.

	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. Information describing compensatory actions when both channels are out-of-order, and the implementation procedures.** **c. Additional information describing expedited and compensatory actions in the maintenance procedure to address a condition when one of the instrument channels cannot be restored to functional status within 90 days.**	➢ Verification that instrument readings are within the allowable tolerance band or that actions are taken to address the out of tolerance condition. ➢ Calibration to validate the functionality of the installed instrument channels within 60 days of a planned refueling outage considering normal testing and scheduling allowances (e.g. 25%). ➢ Existing work control processes will be utilized to perform testing and maintenance on the instrument channels. ➢ Allowable channel out of service times and associated actions will be consistent with the guidance provided in NEI 12-02. It should be noted that based on the negligible drift rate of VEGA electronics experienced over a large user base, periodic calibration is not needed. Functional verification can be achieved using cross channel checks and functional checks per vendor manual. b. NEI 12-02, Section 4.3 states *"The primary or back-up instrument channel can be out of service for testing, maintenance and/or calibration for up to 90 days provided the other channel is functional. Additionally, compensatory actions must be taken if the instrumentation channel is not expected to be restored or is not restored within 90 days. If both channels become nonfunctioning then initiate actions within 24 hours to restore one of the channels of instrumentation and implement compensatory actions (e.g., use of alternate suitable equipment or supplemental personnel) within 72 hours."* SFP level instrument may be taken out of service for testing, maintenance and/or calibration for short durations, consistent with current maintenance practices. Upon discovery of a non-functioning SFP level instrument, the issue will be place in the Corrective Action program. Attempts will be made to restore the non-functioning SFP level instrument to service as soon as possible and within 90 days. No compensatory actions will be taken while the one channel is non-functioning as long as the remaining instrument channel is available. If the non-functional channel cannot be restored within 90 days, compensatory actions will include enhanced monitoring of the existing SFP level instrumentation and increased direct visual monitoring of SFP level. The determination of time frames for enhanced

		monitoring will be defined as the procedure development is finalized. If both instrument channels are determined to be out-of-order, actions will be initiated within 24 hours to restore one of the instrument channels to full functionality within 72 hours or compensatory actions will be implemented with 72 hours. Compensatory actions will consider alternate means of monitoring SFP level, such as video cameras or supplemental shift staffing; and may consider decay heat loads in the SFP. c. See response to b.
18 (RAI-18, Ref. 5)	RAI Question: **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.**	Complete. The in-situ calibration process at the SFP location utilizes the capability to rotate the waveguide horn assembly from its normal downward-pointing position so that it can be pointed at a target that is moved along the radar beam path. By placing the moveable target at known distances from the horn, the instrument output can be checked at each target location. In the event that the as-found values are not within acceptance criteria, the measurement range can be shifted up or down to calibrate the instrument to within the required tolerance. (Reference 16) It should be noted that based on negligible drift rate of VEGA electronics experienced over large user base, periodic calibration is not needed. Functional verification can be achieved using cross channel checks and functional checks per vendor manual.

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. Constellation Energy Nuclear Generation, LLC, letter to USNRC, "Supplement to Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation," dated March 8, 2013 (FLL-13-14)

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. Constellation Energy Nuclear Generation, LLC, letter to USNRC, "February 2014 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 24, 2014 (FLL-14-003)
4. Memorandum from C. A. Hunt (USNRC) to M. A. Mitchell (USNRC), "Summary of the November 26, 2013 Public Meeting to Discuss Industry Responses to Staff Interim Evaluations for Spent Fuel Pool Instrumentation," dated December 26, 2013
5. USNRC letter to Constellation Energy Nuclear Generation, LLC, "Constellation Energy Nuclear Group, R.E. Ginna Nuclear Power Plant, 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. MF1147)," dated December 5, 2013
6. AREVA Document No. 66-9218244, "Through Air Radar Spent Fuel Pool Level Indication (SFPLI) Instrument Factory Acceptance Test (FAT) Report for R.E. Ginna," Revision 000
7. AREVA Document No. 66-9221608, "Through Air Radar Spent Fuel Pool Level Instrument (SFPLI) Site Acceptance Test (SAT) Report for R.E. Ginna," Revision 001
8. NRC Interim Staff Guidance JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," Revision 0
9. Nuclear Energy Institute 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
10. Constellation Energy Nuclear Generation, LLC, letter to USNRC, "Supplement to Overall Integrated Plan for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 8, 2013 (FLL-12-15)
11. NRC Order Number EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012
12. O-6.1, "Auxiliary Operator Rounds and Log Sheets," Revision 05300
13. ER-SFP.2, "Diverse SFP Makeup and Spray," Revision 00300
14. CPI-LVL-310, "Calibration of SFP Level Northeast Channel Loop LT-310," Revision 00000
15. CPI-LVL-311, "Calibration of SFP Level Northeast Channel Loop LT-311," Revision 00000
16. AREVA Document No. 01-9213759, "Through Air Radar Spent Fuel Pool Level Instrument (SFPLI) Instruction Manual for R.E. Ginna," Revision 002