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CENG
a joint venture of
Constellation Energy EDF

February 24, 2014

U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

ATTENTION: Document Control Desk

SUBJECT: **Calvert Cliffs Nuclear Power Plant, Units 1 and 2**
Renewed Facility Operating License Nos. DPR-53 and DPR-69
Docket Nos. 50-317 and 50-318
R.E. Ginna Nuclear Power Plant
Renewed Facility Operating License No. DPR-18
Docket No. 50-244
Nine Mile Point Nuclear Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-63 and NPF-69
Docket Nos. 50-220 and 50-410

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)

REFERENCE: (a) 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 a) to Constellation Energy Nuclear Group, LLC (CENG) for Calvert Cliffs Nuclear Power Plant, LLC (CCNPP), R.E. Ginna Nuclear Power Plant, LLC (Ginna), and Nine Mile Point Nuclear Station, LLC, (NMPNS) Units 1 (NMP1) and 2 (NMP2). Reference (a) requires submission of a status report at six-month intervals following submittal of the overall integrated plan. Attachments (1) through (4) provide the second Six-Month Status Reports for CCNPP, Ginna, NMP1, and NMP2, respectively, pursuant to Section IV, Condition C.2, of Reference (a). These reports update 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.

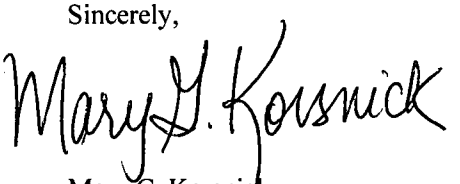
Attachment 5 lists the regulatory commitments contained within this correspondence.

A001
NRR

If there are any questions regarding this submittal, please contact Bruce Montgomery, Manager-Nuclear Safety and Security, at 443-532-6533.

I declare under penalty of perjury that the foregoing is true and correct. Executed on February 24, 2014.

Sincerely,



Mary G. Korsnick

MGK/STD/EMT/bjd

Attachments:
(1) CCNPP 6-Month Status Report (February 2014) for Reliable Spent Fuel Pool Instrumentation
(2) Ginna 6-Month Status Report (February 2014) for Reliable Spent Fuel Pool Instrumentation
(3) NMP1 6-Month Status Report (February 2014) for Reliable Spent Fuel Pool Instrumentation
(4) NMP2 6-Month Status Report (February 2014) for Reliable Spent Fuel Pool Instrumentation
(5) Regulatory Commitments Contained in this Correspondence

cc:
NRC Project Manager, Calvert Cliffs
NRC Project Manager, Ginna
NRC Project Manager, Nine Mile Point
W. M. Dean, NRC
Resident Inspector, Calvert Cliffs
Resident Inspector, Ginna
Resident Inspector, Nine Mile Point
S. Gray, DNR

ATTACHMENT (1)

CCNPP 6-MONTH STATUS REPORT (FEBRUARY 2014)

FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION

1 Introduction

The Calvert Cliffs Nuclear Power Plant, LLC (CCNPP) Overall Integrated Plan (OIP) was submitted to the Nuclear Regulatory Commission (NRC) in February 2013 (Reference 1), documenting the requirements to install reliable spent fuel pool level instrumentation (SFP LI), in response to NRC Order Number EA-12-051(Reference 2). Subsequently, a supplement to the CCNPP SFP LI OIP was submitted to the NRC in March 2013 (Reference 3). By letter dated June 19, 2013 (Reference 4), the NRC requested that CENG respond to a request for additional information (RAI) regarding the CCNPP OIP for Reliable Spent Fuel Pool Instrumentation. By letter dated July 3, 2013 (Reference 5), CENG responded to the June 19, 2013 RAI. By letter dated August 27, 2013, CENG provided the first Six-Month Status Report (Reference 8). By letter dated November 15, 2013 (Reference 9), the NRC issued the CCNPP, Unit Nos. 1 and 2 Interim Staff Evaluation (ISE) and RAI regarding the Overall Integrated Plan for Implementation of Order EA-12-051.

This attachment provides an update of milestone accomplishments since submittal of the last Six-Month Status Report, including any changes to the compliance method, schedule, or need for relief/relaxation and associated basis (if applicable). CCNPP continues to make progress towards completing the design of the AREVA VEGAPULS 62ER Through Air Radar. No significant changes have occurred since the previous six-month status report was submitted in August 2013.

2 Milestone Accomplishments

The following milestones have been completed since the development of the OIP (References 1 and 3), and are current as of January 24, 2014.

- Submitted Overall Integrated Plan 1Q2013
- Issued Purchase Order for Instrumentation 2Q2013
- Commenced Engineering and Design 2Q2013
- Selected Instrumentation and Technology 2Q2013
- Submitted first six-month update 3Q2013

3 Milestone Schedule Status

Table 1 provides an update to the milestone schedule to support the OIP. It 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. Any changes to the following target completion dates will be reflected in subsequent 6-month status reports.

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

Table 1
Status of CCNPP Reliable Spent Fuel Pool Instrumentation OIP Milestones

Milestone	Target Completion Date	Status	Revised Target Completion Date
Commence Engineering and Design	2Q2013	Complete	
Complete Engineering and Design	3Q2013	Started	1Q2014
Receipt of SFP Instruments	1Q2014	Not Started	
Commence Installation of SFP Instruments	2Q2014	Not Started	
Close out Project/Plant Turnover	3Q2014	Not Started	
Respond to NRC ISE RAI	3Q2014	Started	

4 Changes to Compliance Method

Changes were made to the information provided in the OIP that do not change the compliance method with Nuclear Energy Institute (NEI) 12-02 (Reference 7).

Since the July 2013 RAI Response (Reference 5) and August 2013 Six-Month Status Report (Reference 8), the NRC provided CENG with its ISE and RAI regarding the CCNPP OIP for Reliable Spent Fuel Pool Instrumentation (Reference 9). Open items and regulatory commitments that were identified in References 5 and 8 have been superseded by a commitment made in this submittal in response to the ISE RAIs issued in Reference 9. Table 2 provides a list of the open items and regulatory commitments that have been superseded by the commitment made in this submittal. Table 3 provides a list of the ISE RAIs.

These changes continue to meet the guidance in JLD-ISG-2012-03 (Reference 6) and NEI 12-02 (Reference 7).

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

CCNPP 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, or RAI from Interim Staff Evaluation

Table 2 provides a status of the OIP open items documented in the August 2013 Six-Month Status Report (Reference 8). These open items include previous regulatory commitments made in the July 2013 RAI Response (Reference 5). Open items and regulatory commitments that were identified in References 5 and 8 have been superseded by a commitment made in this submittal to provide the information requested by the ISE RAIs issued in Reference 9.

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 10), the ISE questions supersede any previous requests for information issued by the staff concerning the spent fuel pool instrumentation. Table 3 provides a status of the ISE RAIs.

Table 2
Status of CCNPP Reliable Spent Fuel Pool Instrumentation OIP Open Items

CCNPP OIP Open Items	Status
1. Provide for Level 1 how the identified location representing the higher of the two points was specified to the NRC on February 28, 2014, with the second CCNPP OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
2. Provide the final locations/placement of the primary and back-up SFP level sensor, and the proposed routing of the cables locations and cable routing to the NRC on February 28, 2014, with the second CCNPP OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
3. Provide the final mounting details for the horn antenna and waveguide assembly upon completion of the final design to the NRC on February 28, 2014, with the second CCNPP OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
4. Provide the final mounting details for the waveguide piping and radar sensor upon completion of the final design to the NRC on February 28, 2014, with the second CCNPP OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
5. Provide further details of the qualification and test program used to confirm the reliability of the permanently installed equipment during and following Beyond Design Bases Events upon completion of the final design to the NRC on February 28, 2014, with the second CCNPP OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
6. Provide further details of the qualification and test program used to confirm the reliability of the permanently installed equipment during and following seismic conditions upon completion of the final design to the NRC on February 28, 2014, with the second CCNPP OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
7. Provide further details on independence and channel separation of the permanently installed equipment upon completion of the final design to the NRC on February 28, 2014, with the second CCNPP OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
8. Provide a description of the different electrical AC power sources and capacities for the primary and backup channels to the NRC on February 28, 2014, with the second CCNPP OIP status update..	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment

ATTACHMENT (1)
CCNPP 6-MONTH STATUS REPORT (FEBRUARY 2014)
FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION

CCNPP OIP Open Items	Status
9. Provide the final calibration methodology upon completion of the final design to the NRC on February 28, 2014, with the second CCNPP OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
10. Provide specific details of the functional and calibration test program, including frequencies to the NRC on February 28, 2014, with the second CCNPP OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
11. Provide a description of the preventive maintenance, test and calibration program to the NRC on February 28, 2014, with the second CCNPP OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
12. Provide the description of appropriate compensatory actions for both channels out-of-service, administrative requirements, and implementation procedures upon completion of the final design to the NRC on February 28, 2014, with the second CCNPP OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment

Table 3
Status of CCNPP Reliable Spent Fuel Pool Instrumentation Interim Staff Evaluation RAIs

Interim Staff Evaluation RAIs		Status
RAI No.	Description	
1	For Level 1, please specify how the identified location represents the HIGHER of the two points described in the NEI 12-02 guidance for this level.	Started (2/2014)
2	Please describe the impact of the installation of the bulkhead gate on the reliability of the SFP level instrumentation for each SFP, and what compensatory measures would be taken to ensure reliable level indication in each SFP when the bulkhead gate is installed.	Started (2/2014)
3	Please provide additional information describing how the proposed arrangement of the conduit and routing of the cabling between the spent fuel and the location of the read-out/display device meet the guidance 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.	Started (2/2014)
4	Please provide the results of the analyses used to verify the design criteria and methodology for seismic testing of the SFP instrumentation and the electronics units, including, design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces.	Started (2/2014)
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.	Started (2/2014)
6	Please provide analysis of the maximum expected radiological conditions (dose rate and total integrated dose) to which the electronics will be exposed. Also, please provide documentation indicating how it was determined that the electronics for this equipment is 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.	Started (2/2014)
7	Please provide information indicating (a) whether the 80°C rating for the sensor electronics is a continuous duty rating; and, (b) what the maximum expected ambient temperature will be in the room in which the sensor electronics will be located under Beyond Design Basis (BDB) conditions in which there is no ac power available to run Heating Ventilation and Air Conditioning (HVAC) systems.	Started (2/2014)
8	Please provide information indicating the maximum expected relative humidity in the room in which the sensor electronics will be located under BDB conditions, in which there is no ac power available to run HVAC systems, and whether the sensor electronics is capable of continuously performing its required functions under this expected humidity condition.	Started (2/2014)
9	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 that the referenced previous testing provides an appropriate means to demonstrate reliability of the sensor under the effects of severe shock.	Started (2/2014)
10	Please provide information describing the evaluation of the comparative sensor design, the vibration test method, test results, and the forces and their frequency ranges and directions applied to the sensor applicable to its successful tests, demonstrating that the referenced previous testing provides an appropriate means to demonstrate reliability of the sensor under the effects of high vibration.	Started (2/2014)

Interim Staff Evaluation RAIs		Status
RAI No.	Description	
11	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.	Started (2/2014)
12	Please provide the following: a) Description of the specific method or combination of methods you intend to apply to demonstrate the reliability of the permanently installed equipment under BDB ambient temperature, humidity, shock, vibration, and radiation conditions. b) Results for the selected methods, tests and analyses utilized to demonstrate the qualification and reliability of the installed equipment in accordance with the Order requirements.	Started (2/2014)
13	Please provide analysis of the seismic testing results and show that the instrument performance reliability, following exposure to simulated seismic conditions representative of the environment anticipated for the SFP structures at CCNPP, has been adequately demonstrated.	Started (2/2014)
14	Please provide the NRC staff with the final configuration of the power supply source for each channel so that the staff may conclude that the two channels are independent from a power supply assignment perspective.	Started (2/2014)
15	Please provide the results of the calculation depicting the battery backup duty cycle requirements demonstrating that its capacity is sufficient to maintain the level indication function until offsite resource availability is reasonably assured.	Started (2/2014)
16	Please provide analysis verifying that the proposed instrument performance is consistent with these estimated accuracy normal and BDB values. Please demonstrate that the channels will retain these accuracy performance values following a loss of power and subsequent restoration of power.	Started (2/2014)
17	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 spent SFP instrumentation, The licensee is requested to include a brief description of the specific technical objectives to be achieved within each procedure.	Started (2/2014)
18	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 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 when one of the instrument channels cannot be restored to functional status within 90 days.	Started (2/2014)

7 Potential Interim Safety Evaluation Impacts

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

8 References

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

1. Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated February 28, 2013 (ML13066A172).
2. NRC Order Number EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated March 12, 2012 (ML12054A679).
3. Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), Supplement to Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation, dated March 8, 2013 (ML13073A155).
4. Letter from N. S. Morgan (NRC) to G. H. Gellrich (CENG), Calvert Cliffs Nuclear Power Plant, Units Nos. 1 and 2 – Request for Additional Information Regarding Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation, Order EA-12-051(TAC Nos. MF1140 and MF1141), dated June 19, 2013 (ML13164A393)
5. Letter from M .D. Flaherty (CENG) to Document Control Desk (NRC), Response to Request for Additional Information Regarding Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order EA-12-051) (TAC Nos. MF1140 and MF1141), dated July 3, 2013 (ML13190A017).
6. NRC JLD-ISG-2012-03, Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation, Revision 0, August 29, 2012 (ML12221A339).
7. 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, August 2012 (ML12240A307).
8. Letter from E. D. Dean (CENG) to Document Control Desk (NRC), 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 27, 2013 (ML13254A279).
9. Letter from M. C. Thadani (NRC) to J. A. Spina (CENG), Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, and Nine Mile Point Nuclear Station, Unit Nos. 1 and 2, Interim Staff Evaluation and Request for Additional Information Regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation (TAC Nos. MF1131, MF1132, MF1140, and MF1141), dated November 15, 2013 (ML13281A205).
10. 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, dated December 26, 2013 (ML13347B030).

ATTACHMENT (2)

GINNA 6-MONTH STATUS REPORT (FEBRUARY 2014)

FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION

1 Introduction

The R. E. Ginna Nuclear Power Plant, LLC (Ginna) Overall Integrated Plan (OIP) was submitted to the Nuclear Regulatory Commission (NRC) in February 2013 (Reference 1), documenting the requirements to install reliable spent fuel pool level instrumentation (SFP LI), in response to Reference 2. Subsequently, a supplement to the Ginna OIP for SFP LI was submitted to the NRC in March 2013 (Reference 3). In August 2013 the Ginna OIP for SFP LI, Revision 1, was submitted to the NRC as part of the Six-Month Status Report (Reference 4). By letter dated August 29, 2013 (Reference 5), the NRC requested that CENG respond to a request for additional information (RAI) regarding the Ginna OIP for Reliable Spent Fuel Pool Instrumentation. By letter dated September 23, 2013 (Reference 6), CENG responded to the August 29, 2013 RAI. By letter dated December 5, 2013 (Reference 7), the NRC provided Ginna with its Interim Staff Evaluation (ISE) and RAI regarding the OIP for Reliable Spent Fuel Pool Instrumentation.

This attachment provides an update of milestone accomplishments since submittal of the last six-month status report (Reference 4), including any changes to the compliance method, schedule, or need for relief/relaxation and associated basis (if applicable). Since the submittal of the last status report in August 2013, Ginna has completed the engineering and design phase and has begun the detailed planning work associated with installation of the SFP LI. Factory acceptance testing of both the primary and backup SFP LI channels, with the waveguides configured for installation at Ginna, has been successfully completed. No significant changes to the compliance methodology have occurred since the September, 2013 RAI response (Reference 6) was submitted.

2 Milestone Accomplishments

The following milestones have been completed since the development of the OIP (References 1 and 3), and are current as of January 31, 2014.

- Submitted OIP 1Q2013
- Issued Purchase Order for Instrumentation 2Q2013
- Selected Instrumentation and Technology 2Q2013
- Submitted OIP Revision 1 and 6 Month Status Report 3Q2013
- Commenced Engineering and Design 3Q2013
- Completed Engineering and Design 4Q2013
- Completed Factory Acceptance Testing 1Q2014

3 Milestone Schedule Status

Table 1 provides an update to the milestone schedule to support the OIP (References 1 and 3). It provides the activity status of each item, and whether the expected completion date has changed. The dates are planning dates subject to change as design and implementation details are developed. Any changes to the following target completion dates will be reflected in subsequent 6-month status reports.

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

Table 1
Status of Reliable Spent Fuel Pool Instrumentation OIP Milestones

Milestone	Target Completion Date	Status	Revised Target Completion Date
Commence Engineering and Design	1Q2014	Complete	3Q2013
Complete Engineering and Design	2Q2014	Complete	4Q2013
Receipt of SFP Instruments	1Q2015	Not Started	1Q2014
Commence Installation of SFP Instruments	1Q2015	Not Started	1Q2014
Respond to NRC ISE RAIs	3Q2014	Started	
Close out Project/Plant Turnover	2Q2015	Not Started	

4 Changes to Compliance Method

Changes were made to the information provided in the OIP that do not change the compliance method with Nuclear Energy Institute (NEI) 12-02 (Reference 8)

Since the August 2013 Ginna OIP for SFP LI, Revision 1 (Reference 4), and the September 2013 SFP LI RAI response (Reference 6), the NRC provided Ginna with its ISE and RAI regarding the OIP for Reliable Spent Fuel Pool Instrumentation (Reference 7). Open items and regulatory commitments that were identified in References 4 and 6 have been completed or superseded by responses or a commitment made in this submittal to provide the information requested by the ISE RAIs issued in Reference 7.

Table 2 provides a list of open items and regulatory commitments from References 4 and 6 that have been completed or superseded by the responses or commitment made in this submittal. Table 3 provides a status of the ISE RAIs.

The following is the list of completed ISE RAI responses:

1. **ISE RAI #1: Please provide additional information describing how the proposed arrangement 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.**

   This RAI response is **complete**. All equipment located in areas that are vulnerable to externally generated missiles (Auxiliary Building Operating Floor and SFP area) maintains physical channel separation of at least the width of the shortest side of the SFP. This provides for natural protection from a missile disabling both systems. Horn antenna and waveguide are mounted and routed at opposite sides of the SFP. The transmitter and conduit for its respective cabling that are located on the operating floor are also physically separated by at least the width of the shortest side of the SFP. Further, all cabling for each channel are routed in separate conduit and the transmitter and conduit for the southeast channel are located inside the new fuel storage building.

Equipment located in the Intermediate Floor of the Auxiliary Building is not vulnerable to externally generated missiles that may result from damage to the structure over the SFP as the concrete Auxiliary Building Operating Floor provides protection from missiles that may result from damage to the structure over the SFP.

2. **ISE RAI #3: For each of the mounting attachments required to attach SFP Level equipment to plant structures, please describe the design inputs, and the methodology that will be used to qualify the structural integrity of the affected structures/ equipment.**

   This RAI response is **complete**. The sensor mount and the horn assembly mounts are qualified by calculation using the AISC 9th Edition design manual for steel construction. All anchorages are qualified using concrete anchor bolts and the manufacturer's design guide. The qualification of the anchorages is meant to be a demonstration of the feasibility of the chosen anchorage bolts and anchorage pattern. The final site anchorage is qualified using the site specific design guides.

   The generic sensor calculation qualifies a simple C-channel steel section welded centrally on a ½ inch steel base plate. The base plate is anchored using four concrete anchor bolts. The generic sensor end support uses a generic seismic acceleration of 10g for the safe shutdown earthquake (SSE), which is meant to encompass the seismic response spectra of all the locations where these mounts are installed. The calculation assumes a maximum height of support to be 15 inches off of the wall. All mounts using a smaller length of C-channel are qualified by comparison.

   Mounting of the SFP level transmitter wave guide at Ginna is addressed in calculation DA-ME-13-015, "Seismic Evaluation for SFP Level Indication Radar Guide Pipe and Supports" (Reference 9). Per Reference 9, piping shall be qualified as seismic category I in accordance with EWR 2512, "Design Criteria, Ginna Station Seismic Upgrade Program," (Reference 10) and the pipe supports shall be qualified to loading conditions which bound those specified in Reference 10. Protective steel is not credited for the seismic qualification of the wave guide pipe and shall be qualified for seismic II/I conditions.

   ECP-13-000547, "Spent Fuel Pool Level Indication Modifications for Fukushima Response," (Reference 11) Form-015-7B-01 establishes installation criteria that all equipment installed at the SFP shall be mounted to retain its design configuration during and following the maximum seismic ground motion considered in the SFP structure (Mounting). All equipment installed shall not impact the operation of Seismic Category I equipment during or after a seismic event.

   All equipment installed as part of this modification is qualified per IEEE 344-2004 (Reference 12) against the maximum seismic response spectra that envelopes the maximum seismic ground motion for the SSE. The Auxiliary and Standby Auxiliary Feedwater (SAFW) Buildings are Seismic Category I areas. All equipment is mounted as Seismic Class I or Class II/I. All electrical conduit supports are installed per GC-76.9, "Installation and Inspection of Electrical Equipment, Raceway and Electrical Supports," (Reference 13) per the standard Impell conduit support drawing series. The Control Panel mounting assembly will be mounted to unistrut using the hardware specified in drawing 02-9209819D (Reference 14).

3. **ISE RAI #4: 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.**

   This RAI response is **complete**. Calculation Change Notice ECP-13-000547-CN-005, "Address Maximum Dose a SFP Level Transmitter for Fukushima Project," (Reference 15) calculates that the total integrated dose (TID) is 772 rad at the SFP level transmitter with the SFP level at the top of the racks for 7 days and that the bounding dose rate is 4 rad/hour. The calculation notes that this dose is very conservative as the level transmitter is not installed on the SFP deck, but rather is installed on the exterior surface of the SFP wall. With the additional shielding provided by the SFP wall, the TID would be significantly less.

   AREVA Document No. 51-9202556, "Qualification Analysis of VEGAPULS 62 ER Through Air Radar," (Reference 16) states that the electronics for the SFP LI equipment must be located in an area that is shielded from the direct shine from the fuel, and bounce and scatter effects above the pool. For the purpose of this analysis, the radiation levels in the area do not exceed $1x10^3$ rad.

   NRC Bulletin 79-01B, "Environmental Qualification of Class IE Equipment," Table C-1, "Thermal and Radiation Aging Degradation of Selected Materials," (Reference 17) contains a listing of radiation thresholds for various materials. The most susceptible material, and therefore having the lowest threshold, was N-type metal oxide semiconductor (NMOS) electronics with a threshold of $1x10^3$ rad.

   For current generation operating reactors, the staff's definition of a mild radiation environment for electronic components, such as semiconductors, or any electronic component containing organic materials as a total integrated dose of less than $1x10^3$ rad (NUREG-1793 (Reference 18), Chapter 3 Section 3.11.3.2.1).

   This is further confirmed in Regulatory Guide 1.209 (Reference 19), Section B, which states "ionizing dose radiation hardness levels for MOS IC families range from about 10 gray (Gy) or 1 kilorad (krad) for commercial off-the-shelf (COTS) circuits to about 10^5 Gy (10^4 krad) for radiation hardened circuits."

   Dose rates used for testing electronics using MIL-STD-883J, Method 1019.9 (Reference 20) are 50 rad/second or greater. The fact that this standard test does not test for dose rates lower than 50 rad/second, except as explained below, indicates that high dose rates that are lower than 50 rad/second are not a concern for electronic devices. At very low dose rates, some electronics that contain bipolar of BiCMOS or mixed-signal devices can be susceptible to Enhanced Low Dose Rate Sensitivity (ALDRS). For these devices MIL-STD-883J, Method 1019.9 also requires testing at low dose rate $\leq$ 0.01 rad/second. However, it has been shown that at dose levels up to 10^4 rad there are no true dose rate effects. Therefore, at the total integrated dose estimated for the area where the electronics will be located, low dose rate sensitivity is not a concern.

4. **ISE RAI #7: 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.**

   This ISE RAI is **complete**. Reference 16 documents that the VEGAPULS 62 ER through air radar sensor is similar in form, fit and function to the VEGAPULS 66 that was shock tested in accordance with MIL-S-901D (Reference 21). The test report is contained in AREVA Doc. 38-9193058 (Reference 22). Differences in construction are mainly in the smaller size of the VEGAPULS 62 ER. The shape of the housing, its material construction (precision cast stainless steel), the mass and form factor for the electronics modules, the materials and method for mounting the electronics into the sensor housing are the same between the VEGAPULS 66 and the VEGAPULS 62 ER. The incoupling and antennas for VEGAPULS 62 ER are smaller and lighter than for VEGAPULS 66 and therefore less susceptible to shock. Therefore, the shock testing is considered to be applicable to the VEGAPULS 62 ER sensor and the PLICSCOM indicator.

   The MIL-S-901D test consisted of a total of nine (9) shock blows, three (3) through each of the three (3) principal axes of the sensor, delivered to the anvil plate of the shock machine. The heights of hammer drop for the shock blows in each axis were one (1) foot, three (3) feet and five (5) feet. The Level Indicator was energized and operating throughout the test. At the completion of each shock blow, in addition to visual inspection for evidence of physical damage and leakage, the Level Indicator was also checked for electrical malfunction. There was no apparent physical damage, leakage or electrical malfunction as a result of the shock blows.

   In addition to the MIL-S-901D testing, the VEGAPULS 62 ER sensor has been shock tested in accordance with EN 60068-2-27 (Reference 23), (100g, 6 millisecond (ms)), ten (10) shock blows applied along a radial line through the support flange. Test results document that the requirements were fulfilled.

5. **ISE RAI #8: Please provide information describing the evaluation of the comparative sensor design, the vibration test method, test results, and the forces and their frequency 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.**

   This ISE RAI is **complete**. Reference 16 documents that the VEGAPULS 62 ER through air radar sensor is similar in form, fit and function to the VEGAPULS 66 that was vibration tested in accordance with MIL-STD-167-1 (Reference 24). The test report is contained in AREVA Doc. 38-9193058 (Reference 22). Differences in construction are mainly in the smaller size of the VEGAPULS 62 ER. The shape of the housing, its material construction (precision cast stainless steel), the mass and form factor for the electronics modules, the materials and method for mounting the electronics into the sensor housing are the same between the VEGAPULS 66 and the VEGAPULS 62 ER. The incoupling and antennas for VEGAPULS 62 ER are smaller and lighter than for VEGAPULS 66 and therefore less susceptible to vibration. Therefore, the vibration testing is considered to be applicable to the VEGAPULS 62 ER sensor and the PLICSCOM indicator.

The MIL-STD-167-1 vibration test procedure applies to equipment found on Navy ships with conventional shafted propeller propulsion. The test frequencies ranged from 4 Hz to 50 Hz with amplitudes ranging from 0.048" at the low frequencies to 0.006" at the higher frequencies. This procedure is not applicable to high-speed or surface effect ships that are subject to vibrations for high-speed wave slap, which produce vibration amplitudes and frequencies in excess of the levels on conventional Navy ships.

The potential vibration environment around the SFP and surrounding building structure might contain higher frequencies than were achieved in the testing discussed above. Additional testing of the VEGA PULS 62 ER sensor was performed in accordance with EN 60068-2-6 (Reference 25) Method 204 (except 5g, 500 Hz). Test results document that the testing requirement were met. This additional testing is considered to provide a stand-alone demonstration of the resistance to vibration of the VEGAPULS 62 ER sensor and further substantiates the results of the MIL STD-167-1 testing.

6. **ISE RAI #9: 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.**

   This RAI response is **complete**. The VEGADIS 61 and VEGADIS 62 displays feature housings that are similar in size, materials, and form factor to the VEGAPULS 62 ER sensor, contain a terminal base attached with two screws similar to the electronics module in the VEGAPULS 62 ER, and contain a LCD display module that installs into the housing similar to the PLICSCOM in the VEGAPULS 62 ER. Therefore, these devices are considered to have the same resistance to shock and vibration as the VEGAPULS 62 ER and PLICSCOM as described in the ISE RAI #7 and ISE RAI #8 responses above.

   Evaluation of the comparative display panel ratings against postulated plant conditions by Ginna is performed as part of the Vendor Engineering Product Review per procedure CNG-CM-1.01-2003, "Acceptance of Vendor Engineering Products" (Reference 26). For example, AREVA Document No. 32-9208751, "AREVA Spent Fuel Pool Level Monitoring – Horn and Transmitter Support," (Reference 27) was owner accepted and documents that "The accelerations used by AREVA are conservative and are higher than the evaluated accelerations at Ginna, with a Factor of Safety (FS) > 4.

7. **ISE RAI #10: 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.**

   This RAI response is **complete**. The components used in the power control panel are listed in the Table 4. Table 4 provides the shock and vibration test and/or analysis for each component.

Table 4
Component Shock and Vibration Test and/or Analysis

Component Name	Test standard used	Test levels per manufacturer description
Selector switch	Vibration resistance per IEC 60068-2-6 (Reference 25)	5 g_n (peak acceleration) frequency 2 - 500Hz
	Shock per IEC 60068-2-27 (Reference 23)	30 g_n for 18 ms half sine wave acceleration 50 g_n for 11 ms half sine wave acceleration
Terminal blocks	Not tested, These are considered suitable for use in the in shock and vibration environments based on their previous use in the manufacturer's mobile remote display.	N/A
Power supply	Vibration tested per IEC 60068-2-6 (Reference 25)	(Mounting by rail: Random wave, 10-500 Hz, 2g, ea. Along X, Y, Z axes 10 min/cycle, 60 mi)
	Shock tested per IEC 60068-2-27 (Reference 23)	Half sine wave, 4g, 22 ms, 3 axes, 6 faces, 3 times for each face
Fuse	Vibration tested per MIL-STD-202G (Reference 28)	Method 204, Test Condition C (Except 5g, 500 Hz)
	Shock tested per MIL-STD-202G (Reference 28)	Method 207 (HI Shock)
Indicating light	Not tested for shock or vibration resistance. Failure of light will not impact instrument operability.	N/A
Control relay	Not tested, mounted on dampener (see analysis below)	N/A
Battery	Not tested, mounted on dampener (see analysis below)	N/A
Current isolator	Not tested, mounted on dampener (see analysis below)	N/A

Three components that were not shock or vibration tested by the manufacturers were included in a power control panel that was successfully seismically tested in accordance with the requirements of the IEEE Standard 344-2004 (Reference 12). The seismic test levels reached peaks of 19g in the x direction, 20g in the y direction, and 21g in the z direction. The test response spectra exceeded 10g at all upper frequencies up to 100 Hz beyond which they were not recorded.

Also, these components are mounted to vibration dampeners to further minimize the transfer of external vibration to these components. There are no known reasons that would cause vibration to increase in an Extended Loss of All Power (ELAP) event.

8. **ISE RAI #11: Please provide analysis of the seismic testing results and show that the instrument performance reliability, following exposure to simulated seismic conditions representative of the environment anticipated for the SFP structures at GNPP, has been adequately demonstrated.**

   This ISE RAI is **complete**. A VEGAPULS 62 seismic shake test was performed to the requirements of IEEE 344-2004 (Reference 12) for elements of the VEGAPULS 62 ER through air radar to levels anticipated to envelop most if not all plants in the United States. The equipment qualified included the VEGAPULS 62 ER sensor, PLICSCOM indicating and adjustment module, VEGADIS 62 display, Power Control Panel, rotatable horn waveguide assembly, waveguide piping including standard and repair flanges, and pool end and sensor end mounting brackets. The system was monitored for functionality before and after the resonance search and seismic tests. The required response spectra used for the five Operating Basis Earthquakes (OBEs) and one SSE in the test were taken from EPRI TR-107330 (Reference 29), Figure 4-5.

   In the test of the VEGAPULS 62 ER, the seismic required response spectra (RRS) used for the testing was in accordance with the RRS curve from EPRI TR-107330 (Reference 29) at 5% damping (see Appendix D). This RRS is intended to envelop not only the seismic level for items mounted to building structure, but also the much higher levels that can be experienced for items mounted in or on cabinets due to the additional seismic amplification from cabinet resonances.

   Evaluation of the seismic testing results by Ginna is performed as part of the Vendor Engineering Product Review per procedure CNG-CM-1.01-2003, "Acceptance of Vendor Engineering Products" (Reference 26). For example, AREVA Document No. 32-9208751, "AREVA Spent Fuel Pool Level Monitoring – Horn and Transmitter Support," (Reference 27) was owner accepted and documents that: "The accelerations used by AREVA are conservative and are higher than the evaluated accelerations at Ginna, with an [FS] > 4."

   The waveguide piping between the horn end section and the sensor is supported by mounts provided and qualified by Ginna. The mounts provided by Ginna are not in the scope of AREVA Document No. 51-9202556 (Reference 16). The seismic test configuration had 10'-7½" between supports for the waveguide piping with standard flanges and 6'-3½" between supports for the waveguide piping with repair flanges. These distances represent the maximum allowable distances between supports to maintain seismic qualification. Flanges were located both centrally between supports and near one support to test both conditions. Therefore, flanges may be located at any point between the supports.

Ginna Design Analysis DA-ME-13-015, "Seismic Evaluation of SFP Level Indication Radar System Guide Pipe and Supports," (Reference 9) documents that the SFP Level Indication piping is acceptable as designed for all sustained, occasional and thermal loading conditions and that the pipe supports are structurally adequate under all the loading combinations as specified within EWR 2512, "Design Criteria, Ginna Station Seismic Upgrade Program" (Reference 10).

DE-ME-13-015 Assumption 5.8 (Reference 9) documents that the Vendor has qualified their standard bolted flange design seismically to a maximum span of 10'-7½". Ginna's proposed design includes a maximum span of 14'-1". This is acceptable based on the low stress levels calculated within this design analysis and the significant difference of the response spectra for the Ginna Auxiliary Building 315' elevation (5g peak) compared to the EPRI TR-107330 (Reference 29) response spectra (14g peak) used to qualify the waveguide components, a FS of 2.8. Increasing the span by 33% is expected to increase the moment, and resulting stress levels, by a factor of 1.77, based on the beam equation for a uniform loading condition.

Additionally, an envelope of the response spectra for the 271' and 315' elevations in the Auxiliary Building is conservatively used. The response spectra for the 278' elevation is expected to be much closer to the 271' response spectra (1.2g peak, FS of 11.7), as the local ground elevation is 271' and SFP concrete structure extends from the 278' elevation down to bedrock. The significant increase in accelerations from the 271' to the 315' elevation is due to the transition of the structure from below grade concrete structure to above grade steel framed structure.

Additional support is provided by straps which are not credited for the seismic qualification will be installed on the protective steel structures at the transfer slot. Although not credited, these straps will provide additional support for the waveguide pipe.

A small portion of the 315' response spectra curve is greater than the curve of the generic EPRI spectra; however, this is at very low frequencies (< 2 Hz). Based on the models in DA-ME-13-015, Attachments B & C (Reference 9), the 1st mode of the actual configuration of the waveguide piping is outside of this range.

9. **ISE RAI #12: 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.**

This ISE RAI is **complete**. Each control panel will receive an independent non-safety related 120VAC power feed. Power for the northeast channel's control panel will be from ACPDPAF02 (located in the southeast corner of the SAFW building), circuit 8. This panel is fed from Motor Control Center (MCC) E, which is powered from Bus 15. Power for the southeast channel's control panel will be from the planned ACPDPAF05 panel located in the new Diesel Driven Auxiliary Feedwater (DDAFW) building. This panel will be fed from the Rochester Gas & Electric (RG&E) 12 kilovolts (kV) Sodus Line or KDG08 (SAFW Beyond Design Basis Diesel Generator) through breaker 52D1/SAFW as selected by automatic transfer switch 83/SAFW. Each control panel also contains an internal battery backup that is independent from the station's alternating current (AC) and direct current (DC) distribution systems, which will ensure continued level indication on a Station Black scenario by powering the indication in the SAFW building and on the PLISCOM. Since the new DDAFW building will not be available during the

initial construction phase of this modification, power for the southeast channel's control panel will initially be fed from the same source (ACPDPAF02, circuit 8) as the northeast's channel. Once the new DDAFW building is completed, power for the southeast channel's control panel will be re-located.

10. **ISE RAI #13: 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.**

    This ISE RAI is **complete.** The Control panel contains eight Tadiran Model TL-5920 C-cell lithium batteries that provide backup power when normal 120VAC power is not available. The battery storage life is reported by the manufacturer to be up to 20 years. The battery life for worst case condition of 20 milliamps (mA) discharge rate is derived from the manufacturer technical data sheet. Examining the Capacity vs. Current curve for 20 mA discharge rate, it is seen that for -30°C (-22°F), the lifetime is 2.7 Amp-hours (Ah), or 135 hours. Because the chart considers discharge is when voltage drops from the nominal 3.6 volts down to 2.0 volts, a correction factor must be applied to determine lifetime to the point when voltage begins to significantly drop below nominal (considered to be below the full voltage point). The Discharge Characteristics @ 25°C curve shows that at 20 mA discharge rate, discharge to 2 volts occurs at 6.8 Ah whereas the voltage starts to significantly drop at approximately 6.6 Ah, or 97% of total discharge. Applying this factor to the lifetime determined above, the corrected lifetime is 131 hours at -30°C. The lifetime increases significantly at lower discharge rates or at higher temperatures. Lifetimes at the temperatures for a 20 mA discharge rate are summarized in the Table 5.

Table 5
Battery Lifetimes for Various Temperatures with a 20 mA Discharge Rate

Temperature	Ampere-Hours to 2.0 volts	Lifetime to 2.0 volts @ 20 mA (hours)	Lifetime at full voltage @ 20 rnA (hours)
-30°C (-22°F)	2.7	135	131
0°C (32°F)	4.8	240	233
25°C (77°F)	6.8	340	330
55°C (131°F)	7.2	360	349
75°C (167°F)	4.3	215	209

The calculated battery backup times above demonstrate that the backup battery has sufficient capacity to support reliable instrument channel operation until off-site resources can be deployed by the mitigating strategies resulting from Order EA-12-049 (Reference 30).

The following is the completed regulatory commitment from Table 2:

13. **Regulatory Commitment 13: Provide specific requirements of the procedure controlling irradiated equipment or materials stored in the Spent Fuel Pool (SFP), including details of the analysis to be performed, to the NRC in the August 28, 2015 Ginna Overall Integrated Plan (OIP) status update.**

    This regulatory commitment is **complete**: Technical Specification Basis (Reference 31) documents that other items may be stored in the SFP in addition to fresh or discharged fuel

assemblies. These items, in general, fall into the category of Non-Special Nuclear Material (SNM). These items are non-multiplying and, in general, are parasitic to the spent fuel rack local reactivity. Some of the items which fall under this category that can be safely stored in the spent fuel pool are: Dummy Canisters containing Non-SNM, Consolidation Hardware, Dummy Fuel Assemblies, Trash Basket containing full length control rods, etc. The general rule for safely storing these types of items is that any non-multiplying and non-fissile item can be safely stored in any cell location.

Any of these "other items" stored in the SFP will not contribute to a higher dose at the SFP operating floor greater than that bounded by the dose rate and integrated dose analysis as discussed in the ISE RAI #4 response above.

Procedure IP-OPS-6, "Control of Spent Fuel Pool Activities," (Reference 32) requires approval and tracking for all items entering the SFP water except the Tri Nuc equipment and filters, portable skimmer, fuel handling tools, RCCA tools, trash can lid tool, trash cans, Special Nuclear Material and Associate Components (SNMAC), temporary supplemental lighting and cameras, radiation protection underwater survey equipment. Information required includes reason for storage, location and method of storage, dose rate on contact and at 30 centimeters (cm), planned removal date and, if needed, any restrictions or compensatory actions to guard against inadvertent personnel exposure. If storage will be greater than 30 days from the initial SFP entry date, permission from the Operations Manager is required. All items stored greater than 30 days, except SNMAC and the exceptions above, shall have an Action Item assigned to track removal.

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 Interim Safety Evaluation

Table 2 provides a status of the open items documented in the OIP, Revision 1 (Reference 4), and the regulatory commitments documented in the September, 2013 RAI response (Reference 6). Open items and regulatory commitments that were identified in References 4 and 6 have been completed or superseded by responses or a commitment made in this submittal to provide the information requested by the ISE RAIs issued in Reference 7. Explanations for completed items are provided in Section 4.

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 33), the ISE questions supersede any previous requests for information issued by the staff concerning the spent fuel pool instrumentation. Table 3 provides a status of the ISE RAIs.

Table 2
Status of Reliable Spent Fuel Pool Instrumentation OIP Open Items and RAI Response Regulatory Commitments

Ginna OIP Open Items and RAI Response Regulatory Commitments	Status
1. Determine the accuracy of the SFP water level instrument channels during the engineering and design phase. Final instrument accuracy will be determined following installation testing implemented as part of the design change acceptance process.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
2. Instrument channel design criteria will be finalized during the engineering and design phase.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
3. The full hydrodynamic/seismic qualification details will be forwarded to the NRC on February 28, 2014 with the second Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
4. The final mounting details for the horn antenna, waveguide assembly, waveguide piping, and radar sensor will be available upon completion of the final design and will be forwarded to the NRC on February 28, 2014 with the second Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
5. Expected transmitter temperatures will be determined during the engineering and design phase to verify that the equipment will operate at the expected temperatures and results will be forwarded on February 28, 2014, with the second Ginna OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
6. A calculation will be performed to verify that the electronics do not exceed their dose limit of $1x10^3$ rads with SFP water at Level 3 for seven days. The calculation reference information will be provided on February 28, 2014, with the second Ginna OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
7. Further details of the qualification and test program used to confirm the reliability of the permanently installed equipment during and following Beyond Design Bases Events, including seismic conditions, will be forwarded to the NRC on February 28, 2014 with the second Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
8. Further details on independence and channel separation of the permanently installed equipment will be available upon completion of the final design and will be forwarded on February 28, 2014, with the second Ginna OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
9. Further details on the AC and DC power supplies of the permanently installed equipment will be forwarded to the NRC on February 28, 2014 with the second Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment

Ginna OIP Open Items and RAI Response Regulatory Commitments	Status
10. Specific details of the functional and calibration test program, including frequencies and the final calibration methodology, will be forwarded on February 28, 2014, with the second Ginna OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
11. The compensatory actions to take when both channels are out of service, and the applicable administrative requirements and implementation procedures will be available and the information summarized in the August 28, 2015 Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
12. The preventive maintenance, test and calibration program information will be available following completion of the final design and will be summarized in the February 28, 2014, Ginna OIP status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
13. Provide specific requirements of the procedure controlling irradiated equipment or materials stored in the Spent Fuel Pool (SFP), including details of the analysis to be performed, to the NRC in the August 28, 2015 Ginna Overall Integrated Plan (OIP) status update. (**Regulatory Commitment**) (**Referenced in Ginna ISE Section 3.2**)	**Complete (2/2014)**
14. Further details on independence and channel separation of the permanently installed equipment will be provided in the August 28, 2015 Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
15. The final calibration methodology will be forwarded to the NRC on August 28, 2014 with the third Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
16. Specific details of the functional and calibration test program, including frequencies, will be developed as part of the final instrument design and will be forwarded to the NRC on August 28, 2014 with the third Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
17. The primary and alternate access route evaluation, continuous habitability at display location(s), continual resource availability for personnel responsible to promptly read displays, and provisions for verbal communications with decision makers for the various SFP drain down scenarios and external events will be evaluated as part of the response to Order EA-12-049. This information will be provided in the August 28, 2015 Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
18. The reasons justifying why the display locations selected enable the information from these instruments to be considered "promptly accessible" from a response time perspective, including a discussion of various drain-down scenarios, will be provided in the August 28, 2015 Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/14/2104)** Superseded by ISE RAI Regulatory Commitment

Ginna OIP Open Items and RAI Response Regulatory Commitments	Status
19. The list of procedures for operating (both normal and abnormal response), calibration/test, maintenance and inspection, along with the technical objectives to be achieved within each procedure will be provided in the August 28, 2015 Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
20. The preventive maintenance, test and calibration program will be available following completion of the final design and will be summarized in the August 28, 2014 Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
21. The compensatory actions to take when a channel is not restored within 90 days, and the applicable administrative requirements and implementation procedures will be available and the information summarized in the August 28, 2015 Ginna OIP status update. (**Regulatory Commitment**)	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment

Table 3
Status of Reliable Spent Fuel Pool Instrumentation ISE RAIs

Ginna ISE RAIs	Status
1. Please provide additional information describing how the proposed arrangement 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.	**Complete (2/2014)** See Section 4 for details
2. 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 (2/2014)
3. For each of the mounting attachments required to attach SFP Level equipment to plant structures, please describe the design inputs, and the methodology that will be used to qualify the structural integrity of the affected structures/ equipment.	**Complete (2/2014)** See Section 4 for details
4. 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 (2/2014)** See Section 4 for details
5. Please provide information indicating (a) whether the 80°C 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 Conditioning (HVAC) systems.	Started (2/2014)
6. 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 (2/2014)
7. 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 (2/2014)** See Section 4 for details

Ginna ISE RAIs	Status
8. Please provide information describing the evaluation of the comparative sensor design, the vibration test method, test results, and the forces and their frequency 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.	**Complete (2/2014)** See Section 4 for details
9. 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 (2/2014)** See Section 4 for details
10. 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 (2/2014)** See Section 4 for details
11. Please provide analysis of the seismic testing results and show that the instrument performance reliability, following exposure to simulated seismic conditions representative of the environment anticipated for the SFP structures at Ginna, has been adequately demonstrated.	**Complete (2/2014)** See Section 4 for details
12. 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 (2/2014)** See Section 4 for details
13. 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 (2/2014)** See Section 4 for details
14. 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 following a loss of power and subsequent restoration of power.	Started (2/2014)
15. 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 periodically.	Started (2/2014)

Ginna ISE RAIs	Status
16. 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 objectives to be achieved within each procedure.	Not Started
17. 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 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.	Started (2/2014)
18. Please provide a description of the in-situ calibration process at the SFP location that will result in the channel calibration being maintained at its design accuracy.	Started (2/2014)

7 Potential Interim Safety Evaluation Impacts

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

8 References

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

1. Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated February 28, 2013 (ML13066A172)
2. NRC Order Number EA-12-051, Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated March 12, 2012 (ML12054A679)
3. Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), Supplement to Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation, dated March 8, 2013 (ML13073A155)
4. Letter from E. D. Dean (CENG) to Document Control Desk (NRC), 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 27, 2013 (ML13254A279)
5. Letter from M. C. Thadani (NRC) to M. G. Korsnick (CENG), R.E. Ginna Nuclear Power Plant – Request for Additional Information Re: Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order EA-12-051) (TAC No. MF1174), dated August 29, 2013 (ML13226A382)
6. Response to Request for Additional Information Re: Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order EA-12-051) (TAC No. MF1174), dated September 23, 2013 (ML13269A011)
7. Letter from M. C. Thadani (NRC) to J. A. Spina (CENG), 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 (ML13337A625)
8. 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, August 2012 (ML12240A307)
9. DA-ME-13-015, Seismic Evaluation for SFP Level Indication Radar Guide Pipe and Supports, Revision 000
10. EWR 2512, Design Criteria, Ginna Station Seismic Upgrade Program, Revision 5
11. ECP-13-000547, Spent Fuel Pool Level Indication Modifications for Fukushima Response, Revision 0000
12. IEEE Standard 344-2004, "Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations"
13. GC-76.9, "Installation and Inspection of Electrical Equipment, Raceway and Electrical Supports, Revision 00503
14. Drawing 02-9209819D, Vega Power Control Panel Mounting Assembly (SFP Level Instruments)
15. ECP-13-000547-CN-005, Address Maximum Dose a SFP Level Transmitter for Fukushima Project, Revision 000

16. AREVA Document No. 51-9202556, Qualification Analysis of VEGAPULS 62 ER Through Air Radar, Revision 1 (Proprietary)
17. NRC Bulletin 79-01B, Environmental Qualification of Class IE Equipment
18. NUREG 1793, Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design, Initial Report
19. Regulatory Guide 1.209, Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants, March 2007
20. MIL-STD-883J, Department of Defense Test Method Standard, Microcircuits
21. MIL-S-901D (NAVY), Military Specification: Shock Tests. H.I. (High Impact) Shipboard Machinery, Equipment, and Systems, Requirements for; March 17, 1989
22. AREVA Doc. 38-9193058, Report of Shock and Vibration Tests on Two (2) 3" Navy Flange Mount Level Indicators and One (1) 3" Triclamp, 1-1/2" Navy Flange Mount Level Indicator, Revision 000
23. EN 60068-2-27, Environmental testing. Tests. Test Ea and guidance. Shock
24. MIL-STD-167-1, "Military Standard: Mechanical Vibrations of Shipboard Equipment (Type i - Environmental and Type ii - Internally Excited), May 1, 1974
25. EN 60068-2-6, Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)
26. CNG-CM-1.01-2003, Acceptance of Vendor Engineering Products, Revision 00100
27. AREVA Document No. 32-9208751, AREVA Spent Fuel Pool Level Monitoring – Horn and Transmitter Support, Revision 001
28. MIL-STD-202G, Department of Defense, Test Method Standard, Electronic and Electrical Component Parts
29. EPRI TR-107330, Generic Requirements Specification for Qualifying a Commercially Available PLC for Safety-Related Applications in Nuclear Power Plants
30. 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 (ML12054A735)
31. Technical Specification Basis for the R. E. Ginna Nuclear Power Plant Docket No. 50-244, Revision 68
32. IP-OPS-6, Control of Spent Fuel Pool Activities, Revision 00200
33. 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, dated December 26, 2013 (ML13347B030)

ATTACHMENT (3)

NMP1 6-MONTH STATUS REPORT (FEBRUARY 2014)

FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION

Constellation Energy Nuclear Group, LLC
February 24, 2014

1 Introduction

The Nine Mile Point Unit 1 (NMP1) Overall Integrated Plan (OIP) was submitted to the Nuclear Regulatory Commission (NRC) in February 2013 (Reference 1), documenting the requirements to install reliable spent fuel pool level instrumentation (SFP LI), in response to Reference 2. Subsequently, a supplement to the OIP for SFP LI was submitted to the NRC in March 2013 (Reference 3). By letter dated June 5, 2013 (Reference 4), the NRC requested that CENG respond to a request for additional information (RAI) regarding the NMP1 OIP for Reliable Spent Fuel Pool Instrumentation. By letter dated July 5, 2013 (Reference 5), CENG responded to the June 5, 2013 RAI. By letter dated August 27, 2013, NMP1 provided the first Six-Month Status Report (Reference 6). By letter dated November 15, 2013 (Reference 7), the NRC provided NMP with its Interim Staff Evaluation (ISE) and RAI regarding the OIP for Reliable Spent Fuel Pool Instrumentation.

This attachment provides an update of milestone accomplishments since submittal of the last Six-Month Status Report (Reference 6), including any changes to the compliance method, schedule, or need for relief/relaxation and associated basis (if applicable). NMP1 continues to make progress towards completion of the design for the AREVA VEGAPULs 62ER Through Air Radar System. No significant changes have occurred since the previous Six-Month Status Report was submitted in August (Reference 6).

2 Milestone Accomplishments

The following milestones have been completed since the development of the OIP (Reference 1), and are current as of January 24, 2013.

- Submitted Overall Integrated Plan 1Q2013
- Issued Purchase Order for Instrumentation 2Q2013
- Commenced Engineering and Design 2Q2013
- Selected Instrumentation and Technology 2Q2013
- Submitted first six-month update 3Q2013

3 Milestone Schedule Status

Table 1 provides an update to milestone schedule to support the OIP (References 1 and 3). It 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. Any changes to the following target completion dates will be reflected in 6-month status reports.

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

Table 1
Status of Reliable Spent Fuel Pool Instrumentation OIP Milestones

Milestone	Target Completion Date	Status	Revised Target Completion Date
Commence Engineering and Design	2Q2013	Complete	
Complete Engineering and Design	1Q2014	Started	2Q2014
Respond to NRC ISE RAIs	3Q2014	Started	
Receipt of SFP Instruments	3Q2014	Not Started	
Commence Installation of SFP Instruments	3Q2014	Not Started	4Q2014
Close out Project/Plant Turnover	2Q2015	Not Started	

4 Changes to Compliance Method

Changes were made to the information provided in the OIP that do not change the compliance method with Nuclear Energy Institute (NEI) 12-02 (Reference 8).

Since the July 2013 RAI Response (Reference 5) and August 2013 Six-Month Status Report (Reference 6), the NRC provided NMP1 with ISE and RAI regarding the OIP for Reliable Spent Fuel Pool Instrumentation (Reference 7). Open items and regulatory commitments that were identified in References 5 and 6 have been superseded by a commitment made in this submittal to provide the information requested by the ISE RAIs issued in Reference 7. Table 2 provides a list of the open items and regulatory commitments that have been superseded by a commitment made in this submittal. Table 3 provides a list of the ISE RAIs.

These changes continue to meet the guidance in JLD-ISG-2012-03 (Reference 3) and NEI 12-02 (Reference 4).

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

NMP1 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 Interim Safety Evaluation

Table 2 provides a status of the OIP open items documented in the August 2013 Six-Month Status Report (Reference 6). These open items include previous regulatory commitments made in the July 2013 RAI Response (Reference 5). Open items and regulatory commitments that were identified in References 5 and 6 have been superseded by a commitment made in this submittal to provide the information requested by the ISE RAIs issued in Reference 7.

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 9), the ISE questions supersede any previous requests for information issued by the staff concerning the spent fuel pool instrumentation. Table 3 provides a status of the ISE RAIs.

Table 2
Status of NMP1 Reliable Spent Fuel Pool Instrumentation OIP Open Items

NMP1 Open Items	Status
1. Provide specific requirements of the procedure controlling irradiated equipment or materials stored in the SFP, including details of the analysis to be performed, to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
2. The final system component locations and wire routings will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
3. The full hydrodynamic/seismic qualification details will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
4. The final mounting details for the horn antenna and waveguide assembly will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update. .	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
5. Further details of the qualification and test program used to confirm the reliability of the permanently installed equipment during and following Beyond Design Bases Events will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update. .	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
6. Further details on independence and channel separation of the permanently installed equipment will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
7. Further details on the AC and DC power supplies of the permanently installed equipment will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update. .	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment

NMP1 Open Items	Status
8. The final calibration methodology will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
9. Specific details of the functional and calibration test program, including frequencies, will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update. .	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
10. The preventive maintenance, test and calibration program will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
11. The compensatory actions to take when both channels are out of service, and the applicable administrative requirements and implementation procedures will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
12. The compensatory actions to take when a channel is not restored within 90 days, and the applicable administrative requirements and implementation procedures will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update. .	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment

Table 3
Status of NMP1 Reliable Spent Fuel Pool Instrumentation ISE RAIs

NMP1 ISE RAIs	Status
1. Confirm that the correct elevation for Level 2 at NMP1 is 321 ft. 11.5 in. and provide the information regarding specific requirements of the procedure controlling irradiated equipment or materials stored in the SFP, including details of the analysis to be performed to determine the projected dose rate impact and the appropriate Level 2 value as a result of the potential for irradiated material to be stored in the SPF in the future.	Not Started
2. Provide a final labeled sketch or marked-up plant drawing of the plan view of the SFP, depicting the SFP inside dimensions, the planned locations/placement of the primary and back-up SFP level sensor, and the proposed routing of the cables that will extend from these sensors toward the location of the read-out/display device.	Started (2/2014)
3. Provide the results of the analyses used to verify the design criteria and methodology for seismic testing of the SFP instrumentation and the electronics units, including, design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces.	Started (2/2014)
4. 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 (2/2014)
5. Provide information indicating (a) whether the 80°C rating for the sensor electronics is a continuous duty rating; and, (b) what will be the maximum expected ambient temperature in the room in which the sensor electronics will be located under Beyond Design Basis (BDB) conditions in which there is no ac power available to run Heating Ventilation and Air Conditioning (HVAC) systems.	Started (2/2014)
6. Provide information indicating the maximum expected relative humidity in the room in which the sensor electronics will be located under BDB conditions, in which there is no ac power available to run HVAC systems, and whether the sensor electronics is capable of continuously performing its required functions under this expected humidity condition.	Started (2/2014)
7. Provide analysis of the maximum expected radiological conditions (dose rate and total integrated dose) to which the sensor and associated co-located electronic equipment will be exposed. Also, please provide documentation indicating how it was determined that the electronics for this equipment is 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.	Started (2/2014)

ATTACHMENT (3)
NMP1 6-MONTH STATUS REPORT (FEBRUARY 2014)
FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION

NMP1 ISE RAIs	Status
8. 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 that the referenced previous testing provides an appropriate means to demonstrate reliability of the sensor under the effects of severe shock.	Started (2/2014)
9. Provide information describing the evaluation of the comparative sensor design, the vibration test method, test results, and the forces and their frequency ranges and directions applied to the sensor applicable to its successful tests, demonstrating that the referenced previous testing provides an appropriate means to demonstrate reliability of the sensor under the effects of high vibration.	Started (2/2014)
10. 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.	Started (2/2014)
11. Provide the results of seismic testing per IEEE 344-2004, to demonstrate the reliability of the components within the power and control panel with regard to shock and vibration effects.	Started (2/2014)
12. Provide analysis of the seismic testing results and show that the instrument performance reliability, following exposure to simulated seismic conditions representative of the environment anticipated for the SFP structures at Nine Mile Point, has been adequately demonstrated.	Started (2/2014)
13. Provide the final configuration of the power supply source for each channel so that the staff may conclude that the two channels are independent from a power supply assignment perspective.	Started (2/2014)
14. Provide the results of the calculation depicting the battery backup duty cycle requirements demonstrating that its capacity is sufficient to maintain the level indication function until offsite resource availability is reasonably assured.	Started (2/2014)
15. Provide analysis verifying that the proposed instrument performance is consistent with these estimated accuracy normal and BDB values. Please demonstrate that the channels will retain these accuracy performance values following a loss of power and subsequent restoration of power.	Started (2/2014)
16. 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 spent SFP instrumentation. The licensee is requested to include a brief description of the specific technical objectives to be achieved within each procedure.	Started (2/2014)

NMP1 ISE RAIs	Status
17. 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 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 when one of the instrument channels cannot be restored to functional status within 90 days	Started (2/2014)
18. Provide a description of the in-situ calibration process at the SFP location that will result in the channel calibration being maintained at its design accuracy.	Started (2/2014)

7 Potential Interim Safety Evaluation Impacts

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

8 References

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

1. Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated February 28, 2013 (ML13066A172)
2. NRC Order Number EA-12-051, Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated March 12, 2012 (ML12054A679)
3. Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), Supplement to Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation, dated March 8, 2013 (ML13073A155)
4. Letter from M. C. Thadani (NRC) to M. G. Korsnick (CENG), Nine Mile Point Nuclear Station, Units 1 and 2 – Request for Additional Information Re: Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order EA-12-051) (TAC Nos. MF1131 and MF1132), dated June 5, 2013 (ML13154A399)
5. Letter from P. M. Swift (CENG) to Document Control Desk (NRC), Response to Request for Additional Information Re: Overall integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) (TAC Nos. MF1131 and MF1132), dated July 5, 2013 (ML13197A220)

6. Letter from E. D. Dean (CENG) to Document Control Desk (NRC), 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 27, 2013 (ML13254A279)
7. Letter from M. C. Thadani (NRC) to J. A. Spina (CENG), Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, and Nine Mile Point Nuclear Station, Unit Nos. 1 and 2, Interim Staff Evaluation and Request for Additional Information Regarding The Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation (TAC Nos. MF1131, MF1132, MF1140, and MF1141), dated November 15, 2013 (ML13281A205)
8. 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, August 2012 (ML12240A307)
9. 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, dated December 26, 2013 (ML13347B030)

ATTACHMENT (4)

NMP2 6-MONTH STATUS REPORT (FEBRUARY 2014)

FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION

1 Introduction

The Nine Mile Point Unit 2 (NMP2) Overall Integrated Plan (OIP) was submitted to the Nuclear Regulatory Commission (NRC) in February 2013 (Reference 1), documenting the requirements to install reliable spent fuel pool level instrumentation (SFP LI), in response to Reference 2. Subsequently, a supplement to the OIP for SFP LI was submitted to the NRC in March 2013 (Reference 3). By letter dated June 5, 2013 (Reference 4), the NRC requested that CENG respond to a request for additional information (RAI) regarding the NMP2 OIP for Reliable Spent Fuel Pool Instrumentation. By letter dated July 5, 2013 (Reference 5), CENG responded to the June 5, 2013 RAI. By letter dated August 27, 2013, NMP2 provided the first Six-Month Status Report (Reference 6). By letter dated November 15, 2013 (Reference 7), the NRC provided NMP with its Interim Staff Evaluation (ISE) and RAI regarding the OIP for Reliable Spent Fuel Pool Instrumentation.

This attachment provides an update of milestone accomplishments since submittal of the last Six-Month Status Report (Reference 6), including any changes to the compliance method, schedule, or need for relief/relaxation and associated basis (if applicable). NMP2 continues to make progress towards completion of the design for the AREVA VEGAPULs 62ER Through Air Radar System. No significant changes have occurred since the previous Six-Month Status Report was submitted in August (Reference 6).

2 Milestone Accomplishments

The following milestones have been completed since the development of the OIP (Reference 1), and are current as of January 24, 2014.

- Submitted Overall Integrated Plan 1Q2013
- Issued Purchase Order for Instrumentation 2Q2013
- Commenced Engineering and Design 2Q2013
- Selected Instrumentation and Technology 2Q2013
- Submitted first six-month update 3Q2013

3 Milestone Schedule Status

Table 1 provides an update to milestone schedule to support the OIP (References 1 and 3). It 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. Any changes to the following target completion dates will be reflected in 6-month status reports.

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

Table 1
Status of Reliable Spent Fuel Pool Instrumentation OIP Milestones

Milestone	Target Completion Date	Status	Revised Target Completion Date
Commence Engineering and Design	2Q2013	Complete	
Complete Engineering and Design	1Q2014	Started	2Q2014
Respond to NRC ISE RAIs	3Q2014	Started	
Receipt of SFP Instruments	4Q2014	Not Started	
Commence Installation of SFP Instruments	4Q2014	Not Started	
Close out Project/Plant Turnover	2Q2016	Not Started	

4 Changes to Compliance Method

Changes were made to the information provided in the OIP that do not change the compliance method with Nuclear Energy Institute (NEI) 12-02 (Reference 8).

Since the July 2013 RAI Response (Reference 5) and August 2013 Six-Month Status Report (Reference 6), the NRC provided NMP2 with its ISE and RAI regarding the OIP for Reliable Spent Fuel Pool Instrumentation (Reference 7). Open items and regulatory commitments that were identified in References 5 and 6 have been superseded by commitments made in this submittal to provide the information requested by the ISE RAIs issued in Reference 7. Table 2 provides a list of the open items and regulatory commitments that have been superseded by the commitment made in this submittal. Table 3 provides a list of the ISE RAIs. These changes continue to meet the guidance in JLD-ISG-2012-03 (Reference 3) and NEI 12-02 (Reference 4).

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

NMP2 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 Interim Safety Evaluation

Table 2 provides a status of the OIP open items documented in the August 2013 Six-Month Status Report (Reference 6). These open items include previous regulatory commitments made in the July 2013 RAI Response (Reference 5). Open items and regulatory commitments that were identified in References 5 and 6 have been superseded by a commitment made in this submittal to provide the information requested by the ISE RAIs issued in Reference 7.

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 9), the ISE questions supersede any previous requests for information issued by the staff concerning the spent fuel pool instrumentation. Table 3 provides a status of the ISE RAIs.

Table 2
Status of NMP2 Reliable Spent Fuel Pool Instrumentation OIP Open Items

NMP2 Open Items	Status
1. Provide specific requirements of the procedure controlling irradiated equipment or materials stored in the SFP, including details of the analysis to be performed, to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
2. The final system component locations and wire routings will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
3. The full hydrodynamic/seismic qualification details will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
4. The final mounting details for the horn antenna and waveguide assembly will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
5. Further details of the qualification and test program used to confirm the reliability of the permanently installed equipment during and following Beyond Design Bases Events will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
6. Further details on independence and channel separation of the permanently installed equipment will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
7. Further details on the AC and DC power supplies of the permanently installed equipment will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
8. The final calibration methodology will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment

NMP2 Open Items	Status
9. Specific details of the functional and calibration test program, including frequencies, will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
10. The preventive maintenance, test and calibration program will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAIs Regulatory Commitment
11. The compensatory actions to take when both channels are out of service, and the applicable administrative requirements and implementation procedures will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAI Regulatory Commitment
12. The compensatory actions to take when a channel is not restored within 90 days, and the applicable administrative requirements and implementation procedures will be forwarded to the NRC on February 28, 2014 with the second NMPNS Overall Integrated Plan status update.	**Deleted (2/2014)** Superseded by ISE RAIs Regulatory Commitment

Table 3
Status of NMP2 Reliable Spent Fuel Pool Instrumentation ISE RAIs

NMP2 ISE RAIs	Status
1. Confirm that the correct elevation for Level 2 at NMP2 is 335 ft. 11.9 in. and provide the information regarding specific requirements of the procedure controlling irradiated equipment or materials stored in the SFP, including details of the analysis to be performed to determine the projected dose rate impact and the appropriate Level 2 value as a result of the potential for irradiated material to be stored in the SPF in the future.	Not Started
2. Provide a final labeled sketch or marked-up plant drawing of the plan view of the SFP, depicting the SFP inside dimensions, the planned locations/placement of the primary and back-up SFP level sensor, and the proposed routing of the cables that will extend from these sensors toward the location of the read-out/display device.	Started (2/2014)
3. Provide the results of the analyses used to verify the design criteria and methodology for seismic testing of the SFP instrumentation and the electronics units, including, design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces.	Started (2/2014)
4. 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 (2/2014)
5. Provide information indicating (a) whether the 80°C rating for the sensor electronics is a continuous duty rating; and, (b) what will be the maximum expected ambient temperature in the room in which the sensor electronics will be located under Beyond Design Basis (BDB) conditions in which there is no ac power available to run Heating Ventilation and Air Conditioning (HVAC) systems.	Started (2/2014)
6. Provide information indicating the maximum expected relative humidity in the room in which the sensor electronics will be located under BDB conditions, in which there is no ac power available to run HVAC systems, and whether the sensor electronics is capable of continuously performing its required functions under this expected humidity condition.	Started (2/2014)
7. Provide analysis of the maximum expected radiological conditions (dose rate and total integrated dose) to which the sensor and associated co-located electronic equipment will be exposed. Also, please provide documentation indicating how it was determined that the electronics for this equipment is 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.	Started (2/2014)

NMP2 ISE RAIs	Status
8. 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 that the referenced previous testing provides an appropriate means to demonstrate reliability of the sensor under the effects of severe shock.	Started (2/2014)
9. Provide information describing the evaluation of the comparative sensor design, the vibration test method, test results, and the forces and their frequency ranges and directions applied to the sensor applicable to its successful tests, demonstrating that the referenced previous testing provides an appropriate means to demonstrate reliability of the sensor under the effects of high vibration.	Started (2/2014)
10. 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.	Started (2/2014)
11. Provide the results of seismic testing per IEEE 344-2004, to demonstrate the reliability of the components within the power and control panel with regard to shock and vibration effects.	Started (2/2014)
12. Provide analysis of the seismic testing results and show that the instrument performance reliability, following exposure to simulated seismic conditions representative of the environment anticipated for the SFP structures at Nine Mile Point, has been adequately demonstrated.	Started (2/2014)
13. Provide the final configuration of the power supply source for each channel so that the staff may conclude that the two channels are independent from a power supply assignment perspective.	Started (2/2014)
14. Provide the results of the calculation depicting the battery backup duty cycle requirements demonstrating that its capacity is sufficient to maintain the level indication function until offsite resource availability is reasonably assured.	Started (2/2014)
15. Provide analysis verifying that the proposed instrument performance is consistent with these estimated accuracy normal and BDB values. Please demonstrate that the channels will retain these accuracy performance values following a loss of power and subsequent restoration of power.	Started (2/2014)
16. 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 spent SFP instrumentation. The licensee is requested to include a brief description of the specific technical objectives to be achieved within each procedure.	Not Started

NMP2 ISE RAIs	Status
17. 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 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 when one of the instrument channels cannot be restored to functional status within 90 days	Not Started
18. 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.	Not Started

7 Potential Interim Safety Evaluation Impacts

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

8 References

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

1. Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated February 28, 2013 (ML13066A172)
2. NRC Order Number EA-12-051, Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated March 12, 2012 (ML12054A679)
3. Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), Supplement to Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation, dated March 8, 2013 (ML13073A155)
4. Letter from M. C. Thadani (NRC) to M. G. Korsnick (CENG), Nine Mile Point Nuclear Station, Units 1 and 2 – Request for Additional Information Re: Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order EA-12-051) (TAC Nos. MF1131 and MF1132), dated June 5, 2013 (ML13154A399)
5. Letter from P. M. Swift (CENG) to Document Control Desk (NRC), Response to Request for Additional Information Re: Overall integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) (TAC Nos. MF1131 and MF1132), dated July 5, 2013 (ML13197A220)

6. Letter from E. D. Dean (CENG) to Document Control Desk (NRC), 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 27, 2013 (ML13254A279)
7. Letter from M. C. Thadani (NRC) to J. A. Spina (CENG), Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, and Nine Mile Point Nuclear Station, Unit Nos. 1 and 2, Interim Staff Evaluation and Request for Additional Information Regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation (TAC Nos. MF1131, MF1132, MF1140, and MF1141), dated November 15, 2013 (ML13281A205)
8. 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, August 2012 (ML12240A307)
9. 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, dated December 26, 2013 (ML13347B030)

ATTACHMENT (5)

REGULATORY COMMITMENTS

CONTAINED IN THIS CORRESPONDENCE

ATTACHMENT (5)
REGULATORY COMMITMENTS CONTAINED IN THIS CORRESPONDENCE

The following table defines the Calvert Cliffs Nuclear Power Plant, LLC Units 1 and 2 (CCNPP), R.E. Ginna Nuclear Power Plant, LLC (Ginna), and Nine Mile Point Nuclear Power Station, LLC (NMPNS), Unit 1 (NMP1) and Unit 2 (NMP2) regulatory commitments contained in this correspondence. These regulatory commitments replace the previous regulatory commitments made regarding this subject and address the unanswered NRC's Requests for Additional Information contained in Interim Staff Evaluation (ISE) regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation.

DESCRIPTION	DUE DATE
CCNPP will provide the information requested by the NRC's Requests for Additional Information contained in the Interim Staff Evaluation's regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation.	September 30, 2014
Ginna will provide the information requested by the NRC's Requests for Additional Information contained in the Interim Staff Evaluation regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation.	September 30, 2014
NMP1 will provide the information requested by the NRC's Requests for Additional Information contained in the Interim Staff Evaluation regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation.	September 30, 2014
NMP2 will provide the information requested by the NRC's Requests for Additional Information contained in the Interim Staff Evaluation regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation.	September 30, 2014