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CENG
a joint venture of
Constellation Energy
EDF

August 27, 2013

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

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)

(b) Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation, dated February 28, 2013 (ML13066A172)

(c) 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)

(d) 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)

(e) Letter from N. S. Morgan (NRC) to Calvert Cliffs Nuclear Power Plant, Calvert Cliffs Nuclear Power Plant, Units 1 and 2 – Request for Additional Information Regarding Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation, Order EA-12-051 (TAC Nos. MF11410 and MF1141), dated June 19, 2013 (ML13164A393)

A001
NRR

(f) Letter from M. D. Flaherty (CCNPP) 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)

(g) Letter from P. M. Swift (NMPNS) to Document Control Desk (NRC), Response to Request for Additional Information Re: Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order EA-12-051) (TAC Nos. MF1131 and MF1132), dated July 5, 2013 (ML13197A220)

(h) NEI 12-02, Industry Guidance for Compliance with NRC Order EA-12-051, "To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," Revision 1, dated August 2012 (ML12240A307)

(i) NRC Interim Staff Guidance JLD-ISG-2012-03, Compliance with Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, Revision 0, dated August 29, 2012 (ML12221A339)

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) was immediately effective and directed CCNPP, Ginna, and NMPNS to install reliable spent fuel pool level instrumentation. Specific requirements are outlined in Attachment 2 of Reference (a).

Reference (a) required submission of an overall integrated plan (OIP) pursuant to Section IV, Condition C.1.a. Reference (b) provided the CCNPP, Ginna, and NMPNS OIPs. Reference (c) provided a supplement to the CCNPP, Ginna, and NMPNS OIPs and superseded Reference (b).

In References (d) and (e), the NRC requested that CENG respond to requests for additional information regarding the Nine Mile Point Units 1 and 2 (NMP1 and NMP2) and CCNPP Units 1 and 2 overall integrated plans regarding reliable spent fuel pool instrumentation, respectively, by July 5, 2013. References (f) and (g) provided the CCNPP and the NMP1 and NMP2 responses to these NRC requests for additional information, respectively.

Reference (a) requires submission of a status report at six-month intervals following submittal of the overall integrated plan. Reference (h) provides direction regarding the content of the status reports, as endorsed by Reference (i). The purpose of this letter is to provide the first six-month status report pursuant to Section IV, Condition C.2, of Reference (a) that delineates progress made in implementing the requirements of Reference (a). Attachments (1) through (4) provide the 6-Month Status Reports for CCNPP, Ginna, NMP1, and NMP2, respectively. These reports update the milestone accomplishments since the submittal of the overall integrated plans, including any changes to the compliance method, schedule, or need for relief and the basis, if any.

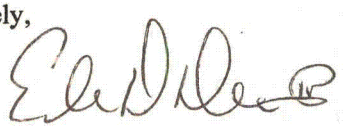
Attachment (5) provides a revision to the Ginna reliable spent fuel pool instrumentation OIP. It was developed in anticipation of Ginna's response to an NRC request for additional information similar to those provided in References (f) and (g) for CCNPP and NMPNS. No revision bars are provided, because the document was revised in its entirety.

This letter contains no new regulatory commitments.

If there are any questions concerning this letter, please contact Everett (Chip) Perkins at everett.perkins@cengllc.com or 410-470-3928.

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 27, 2013.

Sincerely,



EDD/STD

Attachments:
(1) CCNPP 6-Month Status Report for Reliable Spent Fuel Pool Instrumentation
(2) Ginna 6-Month Status Report for Reliable Spent Fuel Pool Instrumentation
(3) NMP1 6-Month Status Report for Reliable Spent Fuel Pool Instrumentation
(4) NMP2 6-Month Status Report for Reliable Spent Fuel Pool Instrumentation
(5) Ginna Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Revision 1)

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

FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION

Constellation Energy Nuclear Group, LLC
August 27, 2013

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 Reference 2. Subsequently, a supplement to the CCNPP SFP LI OIP was submitted to the NRC in March 2013 (Reference 3). This attachment provides an update of milestone accomplishments since submittal of the OIP and the supplement, including any changes to the compliance method, schedule, or need for relief/relaxation and associated basis (if applicable).

No significant changes have occurred since the revised OIP was submitted in March 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 July 15, 2013.

- Submitted OIP 1Q2013
- Issued Purchase Order for Instrumentation 2Q2013
- Commenced Engineering and Design 2Q2013
- Selected Instrumentation and Technology 2Q2013

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.

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	

4 Changes to Compliance Method

Since the initial SFP LI OIP submittal, CCNPP has chosen for both primary and backup channels the AREVA VEGAPULS 62ER Through Air Radar components manufactured by VEGA Americas, Inc. The SFP LI sensors will be located in the northeast and southwest corners in areas of the pool where spent fuel is not stored and in such locations as not to interfere with operation of the spent fuel handling machine.

In addition, by letter dated July 3, 2013, CENG responded to an NRC request for additional information regarding the SFP LI OIP (Reference 4). Attachment (2) to Reference 4 contains regulatory commitments. Table 2 includes these regulatory commitments as open items and provides an updated status for each item. These CENG regulatory commitments will be fulfilled by providing more detailed information on the design, installation and testing of the SFP LI during future six-month updates.

These changes continue to meet the guidance in JLD-ISG-2012-03 (Reference 5) and NEI 12-02 (Reference 6).

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

Table 2 provides a summary of the open items documented in the OIP or the Draft Safety Evaluation and the status of each item.

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.	Started
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.	Started
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.	Started
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.	Started
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.	Not Started
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.	Not Started
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.	Started
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.	Not Started
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.	Not Started
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.	Not Started
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.	Not Started
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.	Not Started

Draft Safety Evaluation Open Item	Status
None	NA

7 Potential Draft Safety Evaluation Impacts

Not applicable.

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.
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.
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.
4. Letter from M.G. Korsnick (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.
5. NRC JLD-ISG-2012-03, Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation, Revision 0, August 29, 2012.
6. 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.

ATTACHMENT (2)

GINNA 6-MONTH STATUS REPORT

FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION

Constellation Energy Nuclear Group, LLC
August 27, 2013

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). This attachment provides an update of milestone accomplishments since submittal of the OIP, including any changes to the compliance method, schedule, or need for relief/relaxation and associated basis (if applicable).

A revision to the Ginna SFP LI OIP was developed in anticipation of Ginna's response to an NRC request for additional information. It is provided as Attachment (5) to this letter.

2 Milestone Accomplishments

The following milestones have been completed since the development of the OIP (References 1 and 3), and are current as of July 15, 2013.

- Submitted OIP 1Q2013
- Issued Purchase Order for Instrumentation 2Q2013
- Selected Instrumentation and Technology 2Q2013

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.

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

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

Milestone	Target Completion Date	Status	Revised Target Completion Date
Commence Engineering and Design	1Q2014	Not Started	3Q 2013
Complete Engineering and Design	2Q2014	Not Started	4Q 2013
Receipt of SFP Instruments	1Q2015	Not Started	4Q 2013
Commence Installation of SFP Instruments	1Q2015	Not Started	1Q 2014
Close out Project/Plant Turnover	2Q2015	Not Started	

4 Changes to Compliance Method

Since the initial SFP LI OIP submittal, Ginna has chosen for both primary and backup channels the AREVA VEGAPULS 62ER Through-Air Radar components manufactured by VEGA Americas, Inc. The SFP LI sensors will be located in the northeast and southeast corners of the SFP instead of the northeast and southwest corners. This was done to minimize impact / interference with the SFP Bridge Crane as well as minimize length of waveguide to keep signal losses from the transmitter as low as possible. This also enhances separation of the SFP LI transmitters from the previous conceptual design.

Installation of SFP LI will be in two phases. The first phase installs the level sensors, transmitters, and cabling to a temporary location in the Auxiliary Building intermediate level. The second phase, to complete the project, will be completed with installation of the new Standby Auxiliary Feedwater Diesel Generator Building.

Table 2 identifies the open items, and provides an updated status for each item. These open items will be fulfilled by providing more detailed information on the design, installation and testing of the spent fuel pool level instrumentation in future six-month updates.

These changes continue to meet the guidance in JLD-ISG-2012-03 (Reference 4) and NEI 12-02 (Reference 5).

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

Ginna expects to comply with the order implementation date and no relief/relaxation is required at this time.

6 Open Items from Overall Integrated Plan and Draft Safety Evaluation

Table 2 provides a summary of the open items documented in the OIP or the Draft Safety Evaluation and the status of each item.

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

Ginna OIP Open Items	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.	Not Started
2. Instrument channel design criteria will be finalized during the engineering and design phase.	Started
3. Full hydrodynamic/seismic qualification details will be forwarded on February 28, 2014, with the second Ginna OIP status update.	Not Started
4. Final mounting details for the horn antenna, waveguide assembly, waveguide piping, and radar sensor will be forwarded on February 28, 2014, with the second Ginna OIP status update.	Started
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.	Not Started
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.	Started
7. Further details of the qualification and test program used to confirm the reliability of the permanently installed equipment during and following seismic conditions will be forwarded on February 28, 2014, with the second Ginna OIP status update.	Not Started
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.	Not Started
9. Further details on the AC and DC power supplies of the permanently installed equipment will be forwarded on February 28, 2014, with the second Ginna OIP status update.	Not Started
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.	Not Started
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.	Not Started
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.	Not Started

Draft Safety Evaluation Open Item	Status
None	NA

7 Potential Draft Safety Evaluation Impacts

Not applicable.

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.
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.
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.
4. NRC JLD-ISG-2012-03, Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation, Revision 0, August 29, 2012
5. 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.

ATTACHMENT (3)

NMP1 6-MONTH STATUS REPORT

FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION

Constellation Energy Nuclear Group, LLC
August 27, 2013

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). This attachment provides an update of milestone accomplishments since submittal of the OIP, including any changes to the compliance method, schedule, or need for relief/relaxation and associated basis (if applicable).

No significant changes have occurred since the original OIP was submitted in References 1 and 3.

2 Milestone Accomplishments

The following milestones have been completed since the development of the OIP (References 1 and 3), and are current as of July 15, 2013.

- Submitted OIP 1Q2013
- Issued Purchase Order for Instrumentation 2Q2013
- Commenced Engineering and Design 2Q2013
- Selected Instrumentation and Technology 2Q2013

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.

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

Table 1
Status of NMP1 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	4Q2013	Started	1Q2014
Receipt of SFP Instruments	3Q2014	Not Started	
Commence Installation of SFP Instruments	3Q2014	Not Started	
Close out Project/Plant Turnover	2Q2015	Not Started	

4 Changes to Compliance Method

Since the initial SFP LI OIP submittal, NMP1 has chosen for both primary and backup channels the AREVA VEGAPULS 62ER Through Air Radar components manufactured by VEGA Americas, Inc. The SFP LI sensors will be located in the northeast and southeast corners of the SFP, instead of the northeast and northwest corners. This change from the previous conceptual design will enhance separation of the SFP LI transmitters.

The SFP LI modification will be designed and implemented under Engineering Change Package ECP-13-13-000651 (Reference 4).

In addition, by letter dated July 5, 2013, CENG responded to an NRC request for additional information regarding the SFP LI OIP (Reference 5). Attachment (2) to Reference 5 contains regulatory commitments. Table 2 includes these regulatory commitments as open items and provides an updated status for each item. These CENG regulatory commitments will be fulfilled by providing more detailed information on the design, installation and testing of the SFP LI during future six-month updates.

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

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 Draft Safety Evaluation

Table 2 provides a summary of the open items documented in the OIP or the Draft Safety Evaluation and the status of each item.

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

NMP1 OIP 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 OIP status update.	Started
2. The final system component locations and wire routings will be forwarded to the NRC on February 28, 2014, with the second NMPNS OIP status update.	Started
3. The full hydrodynamic/seismic qualification details will be forwarded to the NRC on February 28, 2014, with the second NMPNS OIP status update.	Started
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 OIP status update.	Started
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 OIP status update.	Started
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 OIP status update.	Started
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 OIP status update.	Started
8. The final calibration methodology will be forwarded to the NRC on February 28, 2014, with the second NMPNS OIP status update.	Started
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 OIP status update.	Started
10. The preventive maintenance, test and calibration program will be forwarded to the NRC on February 28, 2014, with the second NMPNS OIP status update.	Started
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 OIP status update.	Started
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 OIP status update.	Started

Draft Safety Evaluation Open Item	Status
None	NA

7 Potential Draft Safety Evaluation Impacts

Not applicable.

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.
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.
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.
4. Engineering Change Package ECP-13-000651, Nine Mile Point Unit 1 Spent Fuel Pool Level Instrumentation (SFPLI) Wide Range Monitoring Modification.
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.
6. NRC JLD-ISG-2012-03, Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation, Revision 0, August 29, 2012.
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.

ATTACHMENT (4)

NMP2 6-MONTH STATUS REPORT

FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION

Constellation Energy Nuclear Group, LLC
August 27, 2013

ATTACHMENT (4)
NMP2 6-MONTH STATUS REPORT
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 NMP2 OIP for SFP LI was submitted to the NRC in March 2013 (Reference 3). This attachment provides an update of milestone accomplishments since submittal of the OIP, including any changes to the compliance method, schedule, or need for relief/relaxation and the basis (if applicable).

No significant changes have occurred since the original OIP was submitted in References 1 and 3.

2 Milestone Accomplishments

The following milestones have been completed since the development of the OIP (References 1 and 3), and are current as of July 15, 2013.

- Submitted OIP 1Q2013
- Issued Purchase Order for Instrumentation 2Q2013
- Commenced Engineering and Design 2Q2013
- Selected Instrumentation and Technology 2Q2013

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.

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

Table 1
Status of NMP2 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	
Receipt of SFP Instruments	3Q2014	Not Started	4Q2014
Commence Installation of SFP Instruments	4Q2014	Not Started	
Close out Project/Plant Turnover	2Q2015	Not Started	2Q2016

4 Changes to Compliance Method

Since the initial SFP LI OIP submittal, NMP2 has chosen for both primary and backup channels the AREVA VEGAPULS 62ER Through Air Radar components manufactured by VEGA Americas, Inc.

The SFP LI modification will be designed and implemented under Engineering Change Package ECP-13-000652 (Reference 4)

In addition, by letter dated July 5, 2013, CENG responded to an NRC request for additional information regarding the SFP LI OIP (Reference 5). Attachment (2) to Reference 5 contains regulatory commitments. Table 2 includes these regulatory commitments as open items and provides an updated status for each item. These CENG regulatory commitments will be fulfilled by providing more detailed information on the design, installation and testing of the SFP LI during future six-month updates.

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

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 Draft Safety Evaluation

Table 2 provides a summary of the open items documented in the OIP or the Draft Safety Evaluation and the status of each item.

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

NMP2 OIP 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 OIP status update.	Started
2. The final system component locations and wire routings will be forwarded to the NRC on February 28, 2014, with the second NMPNS OIP status update.	Started
3. The full hydrodynamic/seismic qualification details will be forwarded to the NRC on February 28, 2014, with the second NMPNS OIP status update.	Started
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 OIP status update.	Started
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 OIP status update.	Started
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 OIP status update.	Started
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 OIP status update.	Started
8. The final calibration methodology will be forwarded to the NRC on February 28, 2014, with the second NMPNS OIP status update.	Started
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 OIP status update.	Started
10. The preventive maintenance, test and calibration program will be forwarded to the NRC on February 28, 2014, with the second NMPNS OIP status update.	Started
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 OIP status update.	Started
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 OIP status update.	Started

Draft Safety Evaluation Open Item	Status
None	NA

7 Potential Draft Safety Evaluation Impacts

Not applicable.

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.
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.
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.
4. Engineering Change Package ECP-13-000652, Nine Mile Point Unit 2 Spent Fuel Pool Level Instrumentation (SFPLI) Wide Range Monitoring Modification.
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.
6. NRC JLD-ISG-2012-03, Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation, Revision 0, August 29, 2012.
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.

ATTACHMENT (5)

GINNA OVERALL INTEGRATED PLAN

FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION

(REVISION 1)

Constellation Energy Nuclear Group, LLC
August 27, 2013

ATTACHMENT (5)
GINNA OVERALL INTEGRATED PLAN
FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION (REVISION 1)

I. Introduction

This integrated plan provides the R.E. Ginna Nuclear Power Plant (Ginna) approach for complying with Order EA-12-051 (Reference 1) using the methods described in NRC JLD-ISG-2012-03 (Reference 3). The current revision of the Ginna Overall Integrated Plan is based on conceptual design information and will be revised as detailed design engineering is complete. Consistent with the requirements of Order EA-12-051 and the guidance in Nuclear Energy Institute (NEI) 12-02 (Reference 4), six-month reports will delineate progress made, any proposed changes in compliance methods, updates to the schedule, and if needed, requests for relief and their bases.

This updated plan does not contain any changes to the strategy or compliance methods as prescribed in the Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation, dated March 8, 2013 (Reference 11). This updated plan does contain specific changes and clarification, such as identifying the selected instrumentation, technology applied by the selected instrumentation, location of the instrumentation and updates to the schedule. Note: the Ginna Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation that was submitted on March 8, 2013 was the same document that was submitted on February 28, 2013. Thus, this revision is numbered as Revision 1.

II. Schedule

Installation of reliable Spent Fuel Pool (SFP) water level instrumentation will be completed prior to startup from the second refueling outage after submittal of this plan, but no later than December 31, 2016, (Reference 6).

The current milestones are:

- Commence Engineering and Design 3Q2013
- Complete Engineering and Design 4Q2013
- Receipt of SFP Instruments 4Q2013
- Commence Installation of SFP Instruments 1Q2014
- Close out Project/Plant Turnover 2Q2015

III. Identification of Spent Fuel Pool Water Levels

The SFP is located in the west end of the Auxiliary building. It provides specially designed underwater storage space for the spent fuel pool assemblies which require shielding and cooling during storage and handling. Normal makeup water sources to the SFP are from the refueling water storage tank or one of the chemical and volume control system holdup tanks. The important levels for the pool are as follows: (See Figure 1: SFP Levels)

Key SFP water levels:

1. **Level adequate to support operation of the normal SFP cooling system** – Indicated water level on either the primary or backup instrument channel of greater than elevation 275'-11.5", based on the low water level trip of SFP Pump B, which is approximately 2' below the Top of the SFP and approximately 2' above the pump upper suction line, and is based on preventing air entrainment that may occur due to vortexing, (Ginna Updated Final Safety Analysis Report (UFSAR) Section 9.1.3.2.2, (Reference 10), and Engineering Change Package ECP-11-000754, (Reference 12)) plus the accuracy of the SFP water level instrument channel, which will be determined during the engineering and design phase (**Open Item 1**).
2. **Level adequate to provide substantial radiation shielding for a person standing on the SFP operating deck** - Indicated water level on either the primary or backup instrument channel of greater than elevation 257'-0" plus the accuracy of the SFP water level instrument channel, which will be determined during the engineering and design phase (**Open Item 1**). This elevation is approximately 5'-7" above the top of the fuel racks and ensures a minimum water level of 5'-9" above the top of the fuel. With 5'-7" of water above the top of the fuel racks, the calculated dose rate near the edge of the pool is less than 100 mrem/hr. This monitoring level ensures there is adequate water level to provide substantial radiation shielding for personnel to respond to Beyond-Design-Basis External Events and to initiate SFP makeup strategies. Calculations to determine dose rates near the edge of the SFP with 5'-7" of water above the top of the fuel racks were performed using ORIGEN-ARP for source term calculations and MCNP5 code was used to calculate gamma (primary and capture) and neutron dose rates at the locations of interest. MCNP5 is a general-purpose Monte-Carlo N-Particle code that can be used for neutron, photon, electron, or coupled neutron/photon/electron transport.
3. **Level where fuel remains covered** – Indicated water level on either the primary or backup instrument channel of greater than elevation 251'-5" plus the accuracy of the SFP water level instrument channel, which will be determined during the engineering and design phase (**Open Item 1**). This monitoring level assures that there is adequate water level above the stored fuel seated in the rack.

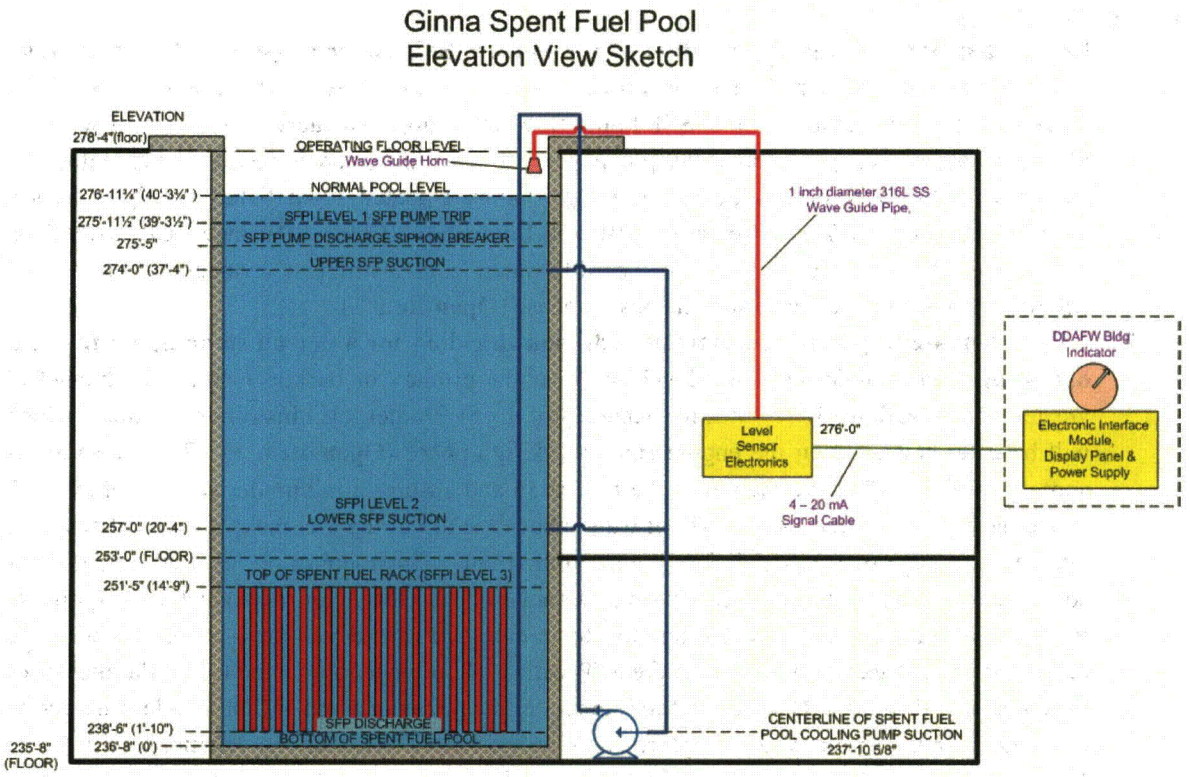


Figure 1: SFP Levels

Instruments

The design of the instruments will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02 as discussed below.

Primary and backup instrument channels will consist of fixed components. The primary and backup instrument channel level sensing components will be located and permanently mounted in the SFP area. The primary and backup instrument channels will provide continuous level indication over a minimum range of about 25 feet 7 inches from the high SFP water level elevation of 277'-0" to the top of the spent fuel racks at elevation 251'-5". This continuous level indication will be provided by a through air radar system.

Primary instrument channel level sensing components will be located in the southeast corner of the SFP. Backup instrument channel level sensing components will be located in the northeast corner of the SFP. The SFP interior distance from the south to north wall is 22'-3". The SFP east to west wall interior distance is 38'-2". The locations of the sensors and transmitters are depicted on Figure 4: *Plan View of SFP Showing New SFP Water Level Instrumentation.*

Figure 1 shows an elevation view sketch of the instrumentation arrangement for Ginna. The sketch shows the datum values of Levels 1, 2, and 3, and the top of the spent fuel racks. The instrument chosen for both primary and backup channels is the AREVA VEGAPULS 62ER Through-Air Radar manufactured by VEGA Americas, Inc. Each channel will be mounted at the SFP edge and comprised of a horn antenna, waveguide assembly and mounting bracket, electronic sensor, and a display panel. As shown in Figures 2 and 3, the radar horn antenna is positioned above the SFP water surface and is capable of measuring the mounting location on the SFP operating deck to the top of the spent fuel racks.

Reliability:

In addition to the discussion in this section, reliability of the primary and backup instrument channels will be assured by conformance with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02, as discussed in Section VII, Qualification. Reliable water level indication will be functional during all modes of operation consistent with Section XV, Testing and Calibration.

Reliability of the permanently installed equipment under Beyond-Design-Basis (BDB) ambient temperature, humidity, shock, vibration, and radiation conditions will be demonstrated through the equipment design, testing, or analysis performed by the vendor. The following qualification elements will be evaluated.

Temperature

The postulated ambient temperature in the SFP area that results from a boiling SFP is 100°C (212°F). The electronics in the sensor are rated for a maximum ambient temperature of 80°C (176°F). The level sensor electronics will be located outside of the SFP area at a lower elevation. The temperature will not exceed the rated temperature.

Humidity

The maximum humidity postulated for the SFP floor elevation is 100% Relative Humidity (RH), saturated steam. The VEGA electronics will be located outside of the SFP floor area in an area away from the steam atmosphere. The waveguide pipe can withstand condensation formed on the inside walls provided there is no pooling of the condensate in the waveguide pipe. This is ensured by installing weep hole(s) at the low spots in the wave guide pipe.

The ability of the radar to "see through" the steam has been demonstrated by testing performed by AREVA. In addition to the AREVA test, VEGA Through-Air Radar has been used in numerous applications that involve measuring the level of boiling liquids. Therefore, operating experience has shown that the Through-Air Radar functions at high levels of steam saturation.

Radiation

The area above and around the SFP will be subject to large amounts of radiation in the event that SFP Level 3 is reached. The only parts of the measurement channel not shielded in the SFP radiation environment are the metallic waveguide and horn, which are not susceptible to the expected levels of radiation. The electronics will be located on the elevation below the SFP operating deck in an area that does not exceed their 1×10^3 rad analyzed limit (**Open Item 6**).

Further details of the qualification and test program used to confirm the reliability of the permanently installed equipment during and following BDB External Events will be available upon completion of the final design and will be forwarded on February 28, 2014 with the second Ginna Overall Integrated Plan status update (**Open Item 7**).

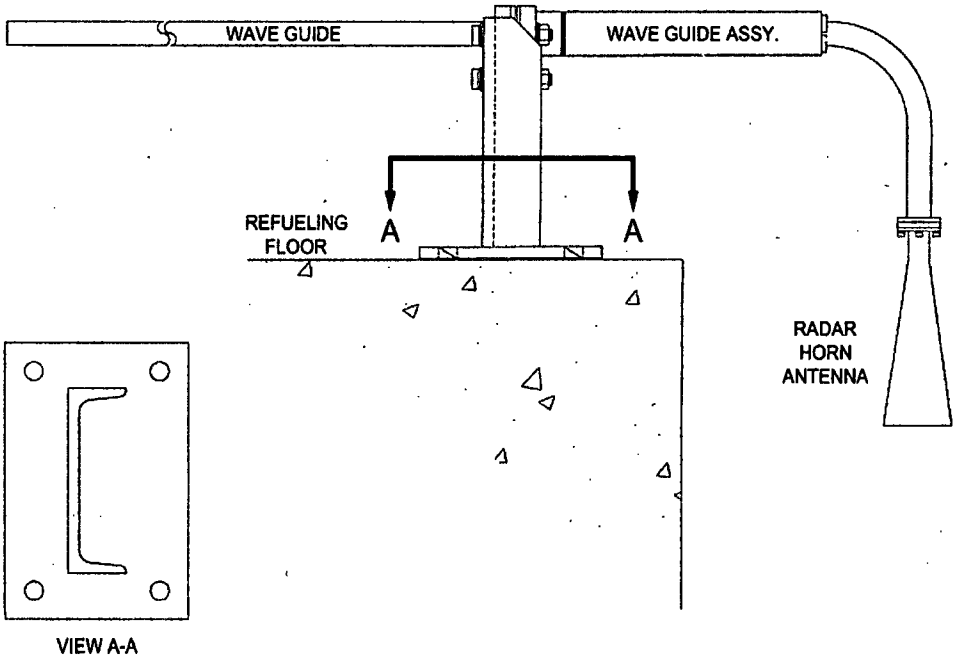


Figure 2: Visual Representation of SFP Edge Mounting Configuration

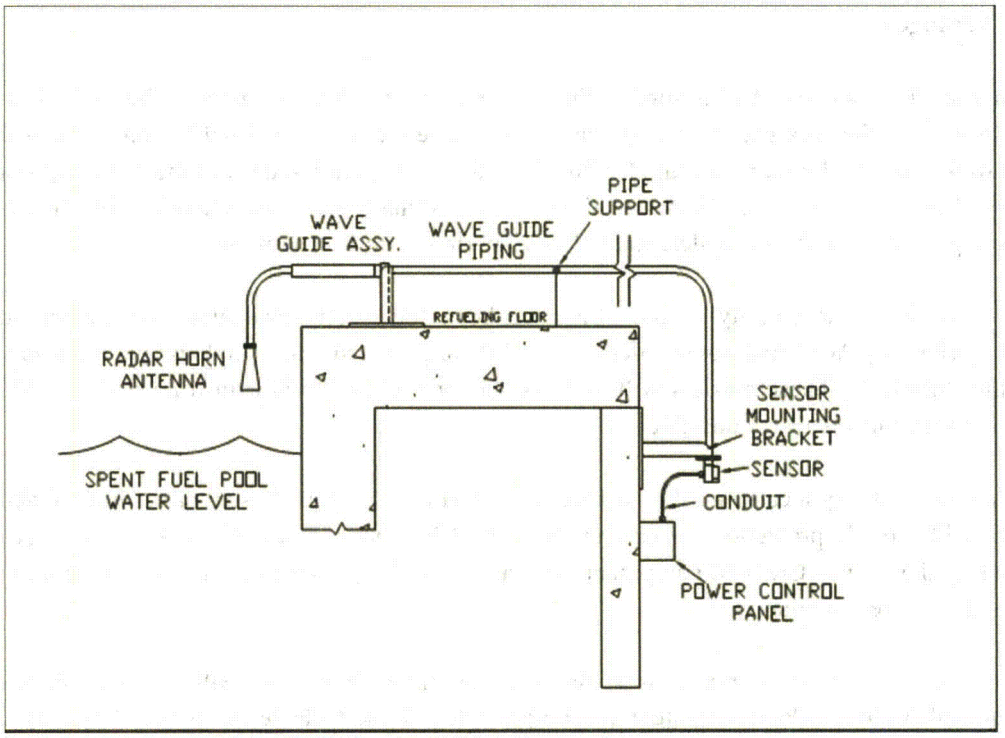


Figure 3: Conceptual Arrangement of the Through-Air System

Instrument Channel Design Criteria:

Instrument channel design criteria will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02 and applicable sections of the Ginna UFSAR. If wireless or other advanced technologies are used:

- An evaluation will be performed to address their interaction with other plant systems, failure modes, and impact on cyber security controls.
- The use of such technologies will be evaluated for any possible adverse impact they may have on other plant equipment likely to be used at the same time as the SFP instrumentation is functioning.
- The ability to perform in the environment in which they may be called upon to function will be demonstrated consistent with the Qualification requirements of this Integrated Plan.
- They will meet the same requirements as wired technologies as specified in this Integrated Plan.

Wireless technologies will not be used.

The remaining design requirements will be finalized during the engineering and design phase (**Open Item 2**).

IV. Arrangement

SFP water level sensors will be installed in the northeast and southeast corners of the SFP. Transmitters will be located on the Auxiliary Building south wall adjacent to the New Fuel Storage Area and outside the east wall of the SFP under the stairs leading from the SFP operating deck to the operating floor of the Auxiliary Building (Figure 4). These locations provide suitable radiation shielding for the electronics, reasonable protection against missiles, and will not interfere with SFP activities.

The block walls in the vicinity of the SFP have been seismically evaluated and are provided with restraints. The East, West and South sides of the SFP are provided with metal and glass barriers that are seismically installed. These barriers will also provide protection for SFP instrumentation. The design will credit these barriers where possible.

The personnel walkway located on the East side of the SFP is seismically supported, located above floor level and will provide protection for equipment located beneath it from seismically generated missiles generated by the event. Credited equipment and cables will be protected from event-generated missiles such as light fixtures and ductwork.

On the Auxiliary Building operating floor, the southeast transmitter cable will be routed down into the Chemical and Volume Control System (CVCS) Holdup Tank Cubicle A in the Auxiliary Building intermediate level, and then to the indicator in the new Standby Auxiliary Feedwater Diesel Generator Building. The northeast transmitter cable will be routed from the transmitter on the Auxiliary Building operating floor down to the Auxiliary Building intermediate level to CVCS Holdup Tank Cubicle B and then to the indicator in the new Standby Auxiliary Feedwater Diesel Generator Building (Figure 5: *Plan View Showing New SFP Instrumentation Pre-DDAFW Building* and Figure 6: *Plan View Showing New SFP Water Level Indication Post-DDAFW Building*). Cable will be routed in rigid steel conduit that will be protected as necessary from seismically and event generated missiles.

The Auxiliary Building intermediate level is protected against external missiles.

Sensors will be located such that they cannot interfere with movement of the fuel handling machine.

Cabling for power supplies and indications for each channel will be routed in separate conduits from cabling for the other channel.

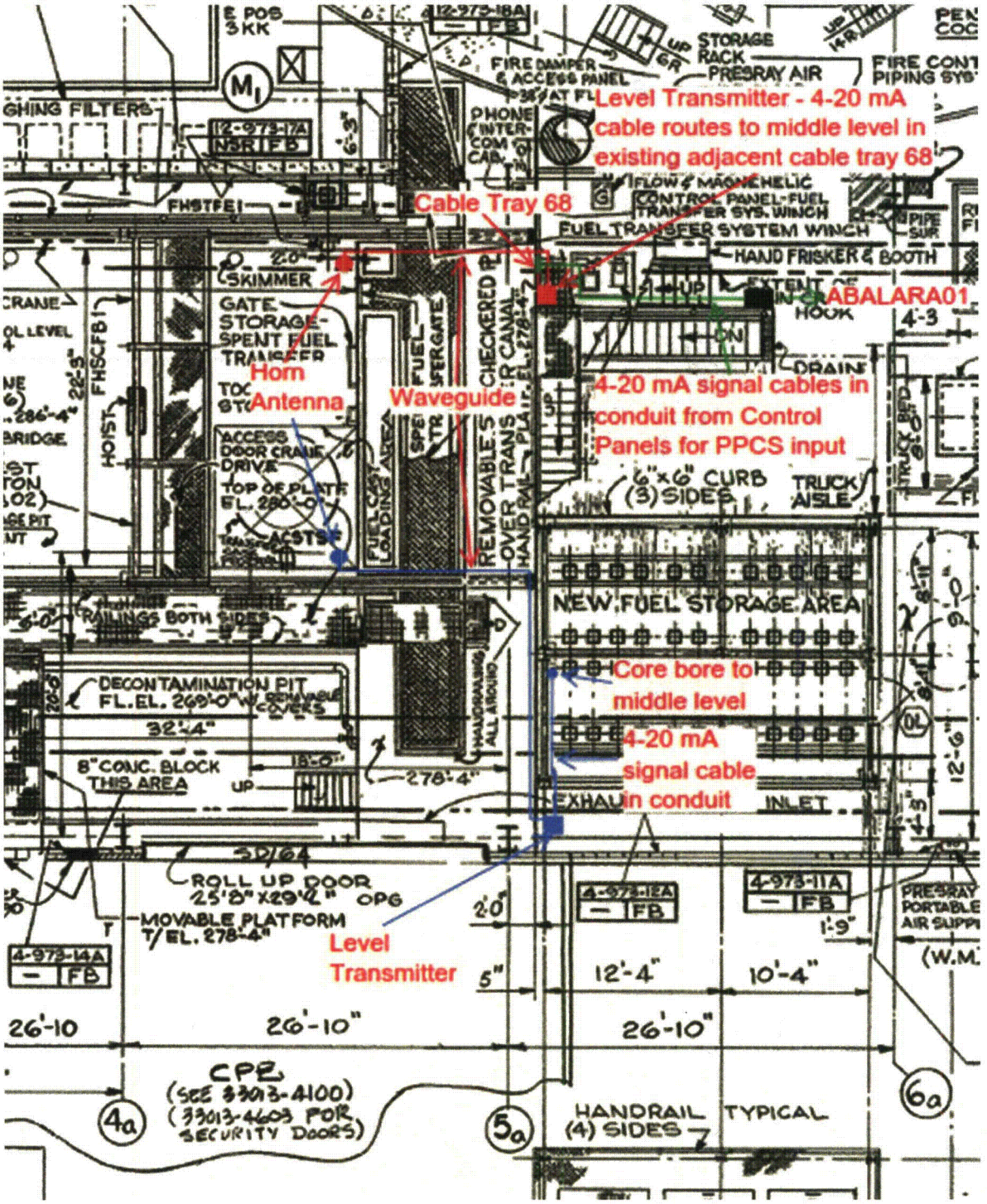


Figure 4: Plan View of SFP Showing New SFP Water Level Instrumentation

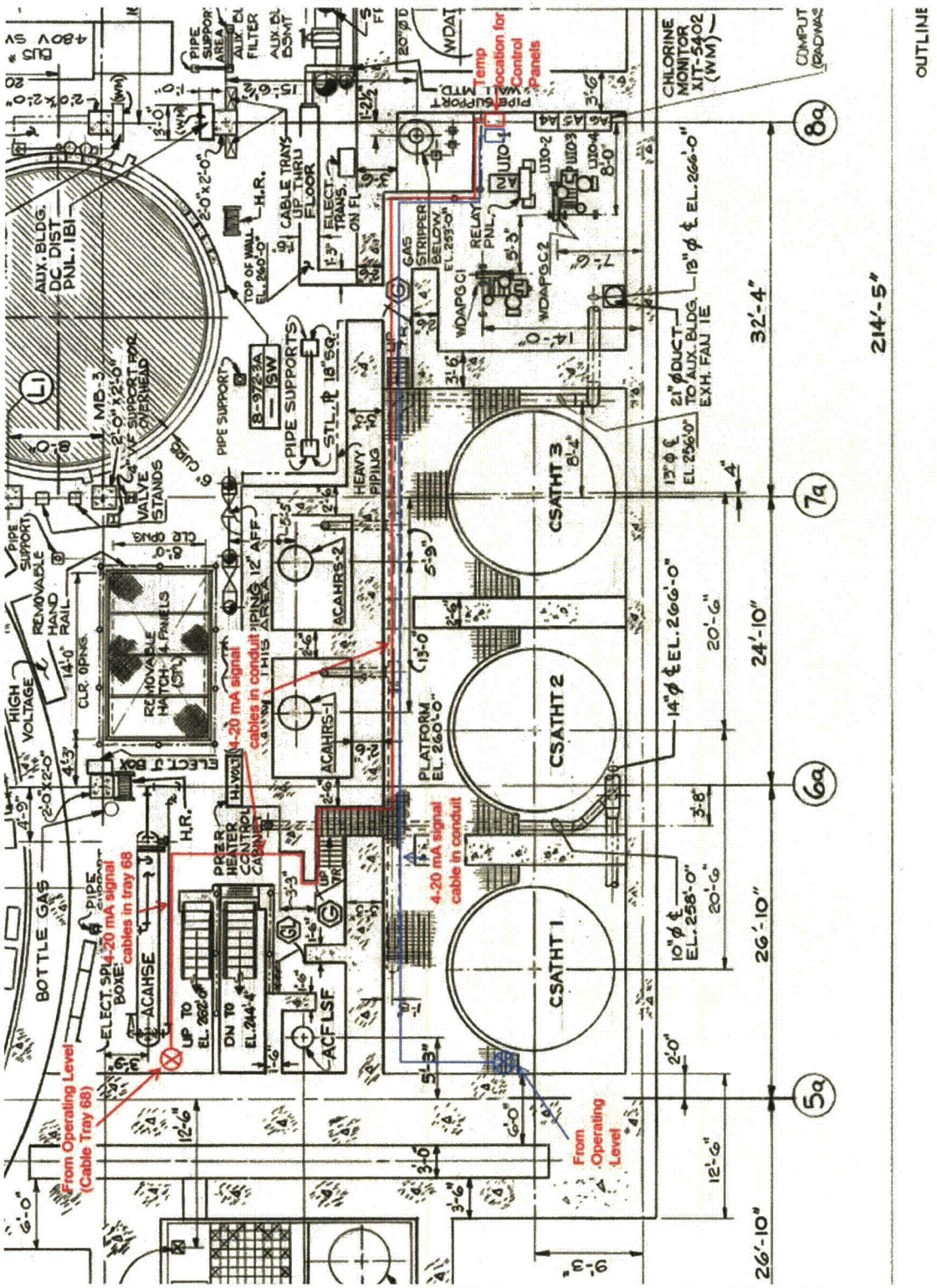


Figure 5: Plan View Showing New SFP Instrumentation Pre-DDAFW Building

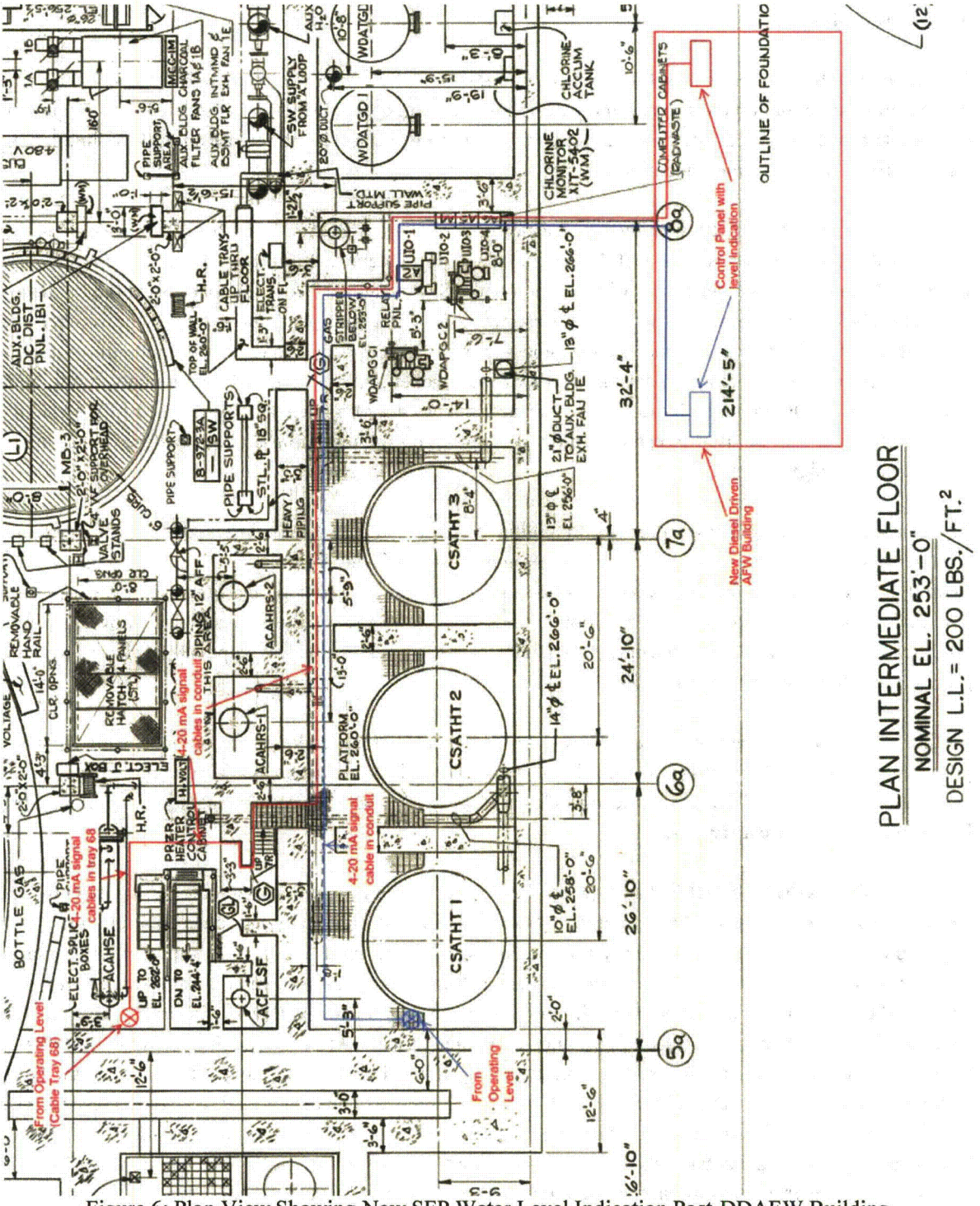


Figure 6: Plan View Showing New SFP Water Level Indication Post-DDAFW Building

V. Mounting

Mounting will be Seismic Class I. Installed equipment will be seismically qualified to withstand the maximum seismic motion considered in the design of the plant area in which it is installed. An evaluation of other hardware stored in the SFP will be conducted to ensure it will not create an adverse interaction with the fixed SFP instrument locations.

The Ginna SFP level instrumentation consisting of AREVA VEGAPULS 62ER Through-Air Radar components that are mounted at the SFP edge include a horn antenna, waveguide assembly and mounting bracket. The radar horn antenna is positioned above the SFP water surface. The loading on the mounting bracket includes the static weight loads and dynamic loads of the horn antenna, waveguide assembly and attached waveguide pipe up to the nearest pipe support. The dynamic loads on the mounting bracket consist of design basis maximum seismic loads of the bracket and the mounted components, along with hydrodynamic loads produced by impinging surface waves caused by seismically-induced SFP sloshing. The design criteria to be used to estimate the total loading on the mounting devices will be based on the plant seismic design bases.

The methodology for ensuring that the mounting bracket and attached equipment can withstand the seismic dynamic forces will be by analysis and/or test of the combined maximum seismic and hydrodynamic forces on the cantilevered portion of the waveguide assembly and horn antenna exposed to potential seismically induced wave action. In addition to the analysis described above, seismic qualification testing will be performed to seismic response spectra that envelop the maximum seismic ground motion for the installed location.

Further details of the seismic evaluation will be provided by the vendor in accordance with the final procurement specification. It is anticipated that the full qualification will be available upon completion of the final design and will be forwarded on February 28, 2014 with the second Ginna Overall Integrated Plan status update (**Open Item 3**).

The AREVA VEGAPULS 62ER Through-Air Radar waveguide horn and waveguide piping assembly is attached to a waveguide assembly mounting bracket. Figure 2 provides a visual representation of the SFP edge mounting configuration. There is no portion of the Through-Air Radar level equipment that contacts the SFP water, nor is there any connection to the SFP liner. The horn antenna is cantilevered over the edge of the SFP and firmly fixed in a direction perpendicular to the SFP water surface. The bracket provides the attachment point for the horn and waveguide assembly to the refueling floor. Four bolts at the base of the bracket fasten the bracket to the refueling floor. For mounting to a concrete floor, the bolts may be anchor bolts in a range of sizes from 3/8 inch to 3/4 inch. The distance of the two nearest bolts to the SFP edge will be determined by the specific requirements of the anchor bolt size used. For mounting to a metal floor, the bracket base may be fastened to the floor by welding. The horn can be away from or next to the SFP liner without impacting the functionality of the level measurement.

Figure 3 provides a standard conceptual arrangement of the elements of the Through-Air Radar system. The waveguide piping that is connected between the waveguide assembly at the SFP edge and the remotely located sensor will be attached to building structures using the applicable site design standards for seismic small bore pipe and supports in accordance with the design change process.

The radar sensor is mounted on a mounting bracket that is fastened to seismically-qualified mounting points, either building structural steel or a concrete wall. Four bolts at the base of the bracket fasten the bracket to the building structure. The fastening method described for the SFP edge mounting bracket applies also to the sensor mounting bracket. Electrical connections to the sensor are made using flexible conduit into one of two available 1/2" NPT threaded openings in the sensor housing.

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 on February 28, 2014 with the second Ginna Overall Integrated Plan status update (**Open Item 4**).

VI. Qualification

The primary and backup channels will be reliable at temperature, humidity, and radiation levels consistent with the SFP water at saturation conditions for an extended period. Saturation temperature at the bottom of the SFP assuming normal water level will be approximately 255°F. Post-event temperature at sensors located above the SFP is assumed to be 212°F. Post event humidity near and above the SFP is assumed to be 100% with condensing steam. Equipment will be qualified for expected conditions at the installed location assuming that normal power is unavailable and that the SFP has been at saturation for an extended period. Equipment located in the vicinity of the SFP will be qualified to withstand peak and total integrated radiation dose levels for its installed location assuming that post-event SFP water level is equal to the top of the spent fuel racks (Level 3) for an extended period of time.

Transmitters will be located at a lower elevation than the SFP operating deck and the temperatures are expected to be lower than the temperature above the SFP and will not have a 100% steam condensing environment. Exposure of the electronics to temperatures above 150°F may result in equipment failure. Expected transmitter temperatures will be determined during the engineering and design phase to verify that the equipment will operate at the expected temperatures (**Open Item 5**). Equipment will be mounted such that it is protected from flooding. The radiation dose at the transmitter locations will also be less as the concrete SFP walls will provide significant radiation shielding.

Sensor mount locations will withstand SFP overflow and the mounts connecting the sensor to the transmitters will be qualified for the SFP environment.

Cables coupling the indicator to the transmitter will be installed in dedicated conduit. The cables from the transmitter to the Standby Auxiliary Feedwater Diesel Generator Building will be routed through existing or new conduit such that they will be protected from event generated missiles.

Instrument channel reliability will be demonstrated via an appropriate combination of design, analyses, operating experience, and/or testing of channel components for the following sets of parameters:

- conditions in the area of the instrument channel component use, for all instrument components,
- effects of shock and vibration on all instrument channel components, and
- seismic effects on instrument channel components used during and following a potential seismic event for installed components.

Augmented quality requirements, similar to those applied to fire protection equipment, will be applied to this project.

The following measures will be used to verify that the design and installation is adequate for seismic effects on instrument channel components used after a potential seismic event for installed components (with the exception of battery chargers and replaceable batteries). Applicable components of the instrument channels will be rated by the manufacturer (or otherwise tested) for seismic effects at levels commensurate with those of postulated design basis event conditions in the location of the instrument channel component using one or more of the following methods:

- a substantial history of operational reliability in environments with significant vibration, such as for portable hand-held devices or transportation applications. Such a vibration design envelope will be inclusive of the effects of seismic motion imparted to the components proposed at the location of the proposed installation;
- adequacy of seismic design and installation will be demonstrated based on the guidance in Sections 7, 8, 9, and 10 of IEEE Standard 344-2004, *IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations*, (Reference 9). A seismic shake test will be performed to the requirements of IEEE 344-2004 for elements of the VEGAPULS 62ER Through-Air Radar to levels anticipated to envelop most if not all plants in the United States. The equipment to be tested includes the readout and power control panel, and the level sensor electronics. The items will be tested to the Required Response Spectra (RRS) contained in EPRI TR-107330 *Qualification of Microprocessor-Based Equipment* to account for the potentially high seismic motion that could occur to cabinet-mounted readout and power control panel. This RRS will also envelop the seismic ground motion for items mounted to the building structure, SFP edge, etc. In addition, the seismic testing includes testing the VEGAPULS 62ER for functionality prior to and post seismic testing, which includes verification of the instrument's accuracy.

VII. Independence

The primary instrument channel will be redundant to and independent of the backup instrument channel, including power supplies.

The two channels of the AREVA Through-Air Radar Spent Fuel Pool Level Measurement system meet the requirement for independence in accordance with the guidance in NRC JLD-ISG-2012-03 and

NEI 12-02 through separation by distance and electrical independence of one another. The horn antenna for each level instrument will be installed on the southeast and northeast corners of the SFP. This separation will be maintained for the routing of the stainless steel waveguide piping and each channel's sensor electronics. Wiring from the sensors and wiring to the power control panels and displays for each channel will be routed in separate conduits to the new Standby Auxiliary Feedwater Diesel Generator Building.

The instrumentation power sources are provided with independent and battery backed-up supplies. The 120 VAC power sources will be determined in the final design process. Independence will be maintained throughout the entire train for each channel. Therefore, failure of one power source will not result in a loss of both instrument channels.

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 Overall Integrated Plan status update (**Open Item 8**).

VIII. Power Supplies

The primary and backup channels will be powered from independent, non-safety related, 120V AC power supplies. As required in NEI 12-02, in the event of loss of primary power, the instruments can be manually switched to backup power. The AREVA VEGAPULS 62ER has a self-contained battery (eight (8) standard C lithium cells) backup source which will support 2.5 years with 30 minutes of operation per day, or >300 hours of continuous operation. During this time it supplies the power to the whole system, i.e., sensor electronics and the display, with a power consumption of < 0.5 Watts.

The sizing of the battery back-up for each channel of the VEGAPULS 62ER is based on the ability to supply the sensor at full load and the level monitoring display, for the duration specified in the plant FLEX program of at least seven days after an Extended Loss of AC Power (ELAP), with built-in margin. The sizing of the battery will be verified by calculation and/or test prior to installation. The self-contained battery system will be independent from existing station batteries.

Further details on the AC and DC power supplies 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 Overall Integrated Plan status update (**Open Item 9**).

IX. Accuracy

The accuracy will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02. Instrument channels will be designed such that they will maintain their design accuracy following a power interruption or change in power source without recalibration.

Accuracy will consider SFP conditions, e.g., saturated water, steam environment, or concentrated borated water. Additionally, instrument accuracy will be sufficient to allow trained personnel to determine when the actual water level exceeds the specified lower level of each indicating range (levels 1, 2 and 3) without conflicting or ambiguous indication. The accuracy will consider the resolution requirements of Figure 1 of NEI 12-02.

The reference accuracy for the instrument defined by the manufacturer is ± 2 millimeters based on sensor horn without a waveguide using a metal target. This accuracy value is subject to change dependent on the actual performance with the installed waveguide constructed to support the desired installation location for each channel. The final instrument accuracy will be determined following installation testing implemented as part of the design change acceptance process **(Open Item 1)**.

The accuracy of the instrument channel is little affected under BDB conditions (i.e., radiation, temperature, humidity, post-seismic and post shock conditions). It will maintain its design accuracy following a power interruption without the need for recalibration. The stainless steel horn antenna and waveguide pipe that would be exposed to BDB conditions is largely unaffected by radiation, temperature and humidity other than a minor effect of condensation forming on the waveguide inner walls which will have a slight slowing effect on the radar pulse velocity. Condensation is prevented from pooling in the waveguide and thus blocking the radar signal by placement of weep holes at low points in the waveguide pipe. A minor effect on the accuracy based on the length of the overall measurement path can occur due to temperature related expansion of the waveguide pipe. The waveguide pipe permits the sensor to be located on the elevation below the refuel floor in mild environment conditions so that the effect of elevated refuel floor temperatures on accuracy is also limited. A small correction factor is applied to account for the impact of saturated steam at atmospheric pressure on the radar beam velocity. Testing performed by AREVA using saturated steam and saturated steam combined with smoke indicate that the overall effect on the instrument accuracy is minimal. The overall accuracy due at BDB conditions described above is conservatively estimated to not exceed ± 3 inches or 0.926% of the 27 foot measurement range, which is within the required ± 1 foot described in NEI 12-02.

The maximum allowed deviation from the instrument channel design accuracy that will be employed under normal operating conditions as an acceptance criterion for a calibration procedure to flag to operators and to technicians that the channel requires adjustment to within the normal condition design accuracy will be based upon the difference between readings of the Primary and Backup level instruments. The estimated design accuracy for each instrument is ± 1 inch. The combined maximum deviation between the two instruments after which calibration is needed is therefore ± 2 inches, based on a still water level in the SFP. A change to design accuracy will likewise cause a proportionate change to the maximum allowable deviation value. The final instrument accuracy will be determined following installation testing implemented as part of the design change acceptance process **(Open Item 1)**.

Calibration of the SFP level system will be performed in-situ as discussed in Section XV of this plan. Channel check and calibration tolerances will be developed as part of the detailed design and incorporated into station maintenance procedures. The final calibration methodology will be available upon

completion of the final design and will be forwarded to the NRC on February 28, 2014 with the second Ginna Overall Integrated Plan status update (**Open Item 10**).

X. Testing

Testing will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02. Instrument channel design will provide for routine testing and calibration that can be performed in-situ consistent with Order EA-12-051 and the guidance in NEI 12-02. Details will be determined during the engineering and design phase. Additional testing and calibration information is provided in Section XV of this plan.

XI. Display

Primary and Backup channel remote indication will be provided in the new Standby Auxiliary Feedwater Diesel Generator Building (Figure 6). The display will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02 by providing on-demand or continuous indication of SFP water level from the top of the SFP to Level 3.

The new Standby Auxiliary Feedwater Diesel Generator Building will be:

- promptly accessible to the appropriate plant staff, including during the occurrence of a SFP drain down event,
- located outside of the area surrounding the SFP floor at an appropriate distance from the radiological sources resulting from an event impacting the SFP,
- a structure that provides protection against adverse weather, and
- located outside of any high radiation areas or LOCKED HIGH RAD AREA during normal operation.

XII. Training

The Systematic Approach to Training (SAT) will be used to identify the population to be trained and to determine both the initial and continuing elements of the required training. Training will be completed prior to placing the instrumentation in service.

XIII. Procedures

Procedures for inspection, maintenance, repair, operation, abnormal response, and administrative controls associated with the SFP level instrumentation will be developed utilizing vendor instructions in accordance with existing controlled station administrative procedures that govern procedure development. These procedures ensure standardization of format, content, terminology and human performance considerations.

Procedures will address a strategy to ensure SFP water level addition is initiated at an appropriate time consistent with implementation of NEI 12-06, *Diverse and Flexible Coping Strategies (FLEX) Implementation Guide* (References 5 and 7).

Procedures will also address the following situations:

- In the event an instrument channel ceases to function during an event, the methodology for returning an instrument channel to normal service within a period of time consistent with the emergency conditions that may apply at the time.
- In the event an instrument channel must be replaced during an event, the methodology for utilizing commercially available components that may or may not meet all of the qualifications stated in (Section VII of this plan) to maintain the instrument channel functionality, until the instrument channel is restored to normal service.

XIV. Testing and Calibration

Processes will be established and maintained for scheduling and implementing necessary testing and calibration of the primary and backup SFP water level instrument channels to maintain the instrument channels at the design accuracy. Testing and calibration of the instrumentation will be consistent with vendor recommendations and any other documented basis. Calibration will be specific to the mounted instrument and the monitor. Calibration of the SFP level system will be performed in-situ. Channel check and calibration tolerances will be developed as part of the detailed design and incorporated into station maintenance procedures. Functionality testing will be performed at the frequency delineated in NEI 12-02. The final calibration methodology will be available upon completion of the final design and will be forwarded on February 28, 2014 with the second Ginna Overall Integrated Plan status update **(Open Item 10)**.

Specific aspects of the calibration and testing process will include:

- Multi-point testing is enabled by means of a radar horn antenna capable of being rotated away from the SFP water surface and aimed at a movable metal target that is positioned at known distances from the horn. This allows checking for correct readings of all indicators along a measurement range and validates the functionality of the installed system.
- The Primary and Backup instrument channels will have indicators that can be compared against each other and against any other permanently-installed SFP level instrumentation. Since the two level channels are independent, a channel check tolerance based on the final design accuracy of each channel will be applied for cross comparison between the two channels. The final accuracy of the instrumentation will be determined following installation testing to develop acceptance criteria for whether recalibration or troubleshooting is needed **(Open Item 10).**
- Functional checks will be performed on a regularly scheduled basis. The functional check includes visual inspection, verification of the instrument display reading, verification of proper power supply voltage, and testing of the battery backup on simulated loss of normal power. Multi-point calibration tests will also be made on a regularly scheduled basis. The frequency as prescribed in NEI 12 02 will be adopted to perform functional testing within 60 days of a planned

refueling outage considering normal testing schedule allowances (e.g., 25%) and not to exceed more than once every 18 months.

- The maintenance and testing program for the SFP level instruments will meet the requirements in NEI 12-02. Periodic functional tests will be scheduled to occur within 60 days of each planned refueling outage. The functional tests will verify that the readings for the Primary and Backup channels are consistent with the actual SFP level. The Through-Air Radar instrument requires no regular preventative maintenance, except for routine replacement of the backup lithium battery cells in the power control panel. This will be performed during regularly scheduled checks and testing.

Instrument channel out of service times as identified in NEI 12-02 will be implemented and controlled consistent with the programmatic process used for compliance with NRC Order EA-12-051. The guidance in NEI 12-02, Revision 1, states:

> *The primary or back-up instrument channel can be out of service for testing, maintenance and/or calibration for up to 90 days provided the other channel is functional. Additionally, compensatory actions must be taken if the instrumentation channel is not expected to be restored or is not restored within 90 days. If both channels become non-functioning then initiate actions within 24 hours to restore one of the channels of instrumentation and implement compensatory actions (e.g., use of alternate suitable equipment or supplemental personnel) within 72 hours.*

In the event a channel of SFP Water level instrumentation is out of service for any reason, the out-of-service time will be administratively tracked with an action to restore the channel to service within 90 days. Functionality of the other channel will be confirmed via appropriate testing measures within the following 7 days and every 90 days thereafter until the non-functioning channel is restored to service.

In the event that a channel cannot be restored to service within the 90 day period, expedited actions to restore the channel would be initiated and tracked via Ginna's Corrective Action Program. If both channels are determined to be non-functional, Ginna will initiate appropriate compensatory actions within 24 hours. The expedited and compensatory actions will be defined in the applicable maintenance procedure.

The appropriate compensatory actions have not yet been specified for both channels out of service. The determination of these actions, administrative requirements, and implementation procedures will be available and the information summarized in the August 28, 2015 Ginna Overall Integrated Plan status update (**Open Item 11**).

The maintenance and testing of the SFP level instrumentation system will be incorporated into the normal station work control processes based on vendor recommendations for maintenance and periodic testing. The calibration and maintenance program will include testing to validate the functionality of each instrument channel within 60 days of a planned refueling outage considering normal testing scheduling allowances (e.g., 25%).

The preventive maintenance, test and calibration program will be developed consistent with the vendor's recommendations. This information will be available following completion of the final design and will be summarized in the February 28, 2014 Ginna Overall Integrated Plan status update (**Open Item 12**).

XV. Need for Relief and Basis

CENG is not requesting relief from the requirements of Order EA-12-051 or the guidance in NRC JLD-ISG-2012-03 at this time.

Consistent with the requirements of Order EA-12-051 and the guidance in NEI 12-02, CENG will submit six-month reports that will delineate the progress made, any proposed changes in the compliance methods, updates to the schedule, and if needed, requests for relief and their bases.

XVI. References

1) EA-12-051, *Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation*, March 12, 2012
2) EA-12-049, *Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events*, March 12, 2012
3) NRC JLD-ISG-2012-03, *Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation*, Revision 0, August 29, 2012
4) 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
5) NEI 12-06, *Diverse and Flexible Coping Strategies (FLEX) Implementation Guide*, Revision 0, August 2012
6) Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), dated October 26, 2012, *Initial Status Report in Response to Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)*
7) Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), dated October 26, 2012, *Initial Status Report in Response to Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*
8) ISO9001, *Quality management systems – Requirements*
9) IEEE Standard 344-2004, *IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations*
10) R.E Ginna Nuclear Power Plant Updated Final Safety Analysis Report, Revision 23.14, January 28, 2013
11) Letter from M. G. Korsnick (CENG) to Document Control Desk (NRC), dated March 8, 2013, *Supplement to Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation*
12) ECP-11-000754, *Evaluate potential for cavitation damage to existing SFP cooling pumps on restart after an extended loss of AC power*, Revision 0, October 7, 2011