



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

August 26, 2015
NOC-AE-15003280
10 CFR 2.202

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

South Texas Project
Unit 1 & 2
Docket Nos. STN 50-498, STN 50-499
5th Six-Month Status Update of Overall Integrated Plan in Response to Order EA-12-051,
Reliable Spent Fuel Pool Instrumentation (TAC Nos. MF0827 and MF0828)

References:

1. Letter, Eric Leeds to All Power Reactor Licensees, "Issuance of Order to Modify Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation," March 12, 2012 (EA-12-051) (ST-AE-NOC-12002271) (ML12054A679)
2. Letter, D. L. Koehl to NRC Document Control Desk, "Overall Integrated Plan Regarding Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," February 28, 2013 (NOC-AE-13002959) (ML13070A006)
3. NRC letter, "South Texas Project, Units 1 and 2 – Request for Additional Information RE: Overall Integrated Plan in Response to Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation" (TAC Nos. MF0827 and MF0828), June 7, 2013 (ML131149A09)
4. Letter, G. T. Powell to NRC Document Control Desk, "Response to Request for Additional Information Regarding the Overall Integrated Plan in Response to Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation" (TAC Nos. MF0827 and MF0828), June 25, 2013 (ML13190A466)
5. Letter, G. T. Powell to NRC Document Control Desk, Six-Month Status Update of Overall Integrated Plan in Response to Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation" (TAC Nos. MF0827 and MF0828), August 27, 2013 (ML13249A078)
6. NRC Letter, South Texas Project, Units 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. MF0827 AND MF0828), September 19, 2013 (ML13254A210)

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7. Letter, G. T. Powell to NRC Document Control Desk, 2nd Six-Month Status Update of Overall Integrated Plan in Response to Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation" (TAC Nos. MF0827 and MF0828) February 27, 2014 (ML14066A388)
8. Letter, G. T. Powell to NRC Document Control Desk, 3rd Six-Month Status Update of Overall Integrated Plan in Response to Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation" (TAC Nos. MF0827 and MF0828) August 27, 2014 (ML14251A028)
9. Letter, G. T. Powell to NRC Document Control Desk, 4th Six-Month Status Update of Overall Integrated Plan in Response to Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation" (TAC Nos. MF0827 and MF0828) February 26, 2015 (ML15069A220)
10. Letter, G. T. Powell to NRC Document Control Desk, Notification of Compliance with Orders EA-12-049 for Mitigation Strategies for Beyond-Design-Basis External Events and EA-12-051 for Reliable Spent Fuel Pool Instrumentation (TAC Nos. MF0826 and MF0828) July 2, 2015 (ML15196A031)

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued an Order (Reference 1) modifying licenses with regard to requirements for reliable spent fuel pool instrumentation. On February 28, 2013, STP Nuclear Operating Company (STPNOC) submitted an Overall Integrated Plan (Reference 2) in response to the NRC Order. By letter dated June 25, 2013 (Reference 4), STPNOC provided additional information requested by the NRC in References 3. Additional information was requested by the NRC in the letter dated September 19, 2013 (Reference 6) in regard to our Overall Integrated Plan. The purpose of this letter is to provide our fifth six-month status of our Overall Integrated Plan pursuant to Section IV, Condition C.2, of Reference 1.

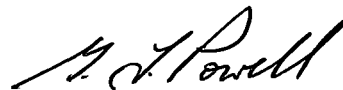
The STPNOC status report is provided in the attachment. The report provides an update of milestone accomplishments required to implement the Order since submittal of the Overall Integrated Plan, including any changes to the compliance method and schedule.

There are no regulatory commitments in this letter.

If there are any questions, please contact Robyn Savage at 361-972-7438.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: August 26, 2015



G. T. Powell
Site Vice President

Attachment: Six Month Status Report for the Implementation of Order Number EA-12-051 - Reliable Spent Fuel Pool Instrumentation

cc:

(paper copy)

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**ATTACHMENT
SIX MONTH STATUS REPORT FOR THE IMPLEMENTATION OF ORDER
NUMBER EA-12-051 RELIABLE SPENT FUEL POOL INSTRUMENTATION**

**Six Month Status Report for the Implementation of Order Number EA-12-051 -
Reliable Spent Fuel Pool Instrumentation**

References:

1. Letter, Eric Leeds to All Power Reactor Licensees, "Issuance of Order to Modify Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation," March 12, 2012 (EA-12-051) (ST-AE-NOC-12002271) (ML12054A679)
2. Letter, D. L. Koehl to NRC Document Control Desk, "Overall Integrated Plan Regarding Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," February 28, 2013 (NOC-AE-13002959) (ML13070A006)
3. NRC letter, "South Texas Project, Units 1 and 2 – Request for Additional Information RE: Overall Integrated Plan in Response to Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation" (TAC Nos. MF0827 and MF0828), June 7, 2013 (ML131149A09)
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5. Letter, G. T. Powell to NRC Document Control Desk, Six-Month Status Update of Overall Integrated Plan in Response to Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation" (TAC Nos. MF0827 and MF0828) August 27, 2013 (ML13249A078)
6. NRC Letter, South Texas Project, Units 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. MF0827 AND MF0828), September 19, 2013 (ML13254A210)
7. Letter, G.T. Powell to NRC Document Control Desk, 2nd Six Month Status Update of Overall Integrated Plan in Response to Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation" (TAC Nos. MF0827 and MF0828) February 27, 2014 (ML 14066A388)
8. Letter, G.T. Powell to NRC Document Control Desk, 3rd Six Month Status Update of Overall Integrated Plan in Response to Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation" (TAC Nos. MF0827 and MF0828) August 27, 2014 (ML14251A028)
9. Letter, G. T. Powell to NRC Document Control Desk, 4th Six-Month Status Update of Overall Integrated Plan in Response to Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation" (TAC Nos. MF0827 and MF0828) February 26, 2015 (ML15069A220)
10. NRC Japan Lessons-Learned Project Directorate Interim Staff Guidance JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation" Revision 0, August 29, 2012 (ML12221A339)

11. 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 (ML122400399)
12. Letter, G. T. Powell to NRC Document Control Desk, Notification of Compliance with Orders EA-12-049 for Mitigation Strategies for Beyond-Design-Basis External Events and EA-12-051 for Reliable Spent Fuel Pool Instrumentation (TAC Nos. MF0826 and MF0828)

Reference 2 provided the Overall Integrated Plan which the STP Nuclear Operating Company (STPNOC) implemented for Unit 2 (See Reference 15) and will implement for Unit 1 to comply with the requirements of NRC Order EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation" (Reference 1), NRC Interim Staff Guidance JLD-ISG-2012-003, Revision 0, (Reference 10) and NEI Report 12-02, Revision 1 (Reference 11). This attachment provides an update of milestone accomplishments since submittal of Reference 12 and the last status update (Reference 9) of the Overall Integrated Plan. This report provides updates to the schedule and changes to the compliance methods that were described in STPNOC's Response to Request for Additional Information (References 3, 4, and 6).

SIX MONTH STATUS REPORT
ORDER EA-12-051, RELIABLE SPENT FUEL POOL INSTRUMENTATION
STP NUCLEAR OPERATING COMPANY
SOUTH TEXAS PROJECT, UNITS 1 AND 2
DOCKET NOS. 50-498 AND 50-499

1. Introduction

This attachment provides the fifth update of milestone accomplishments since submittal of the Overall Integrated Plan, including any changes to the compliance method and schedule.

2. Milestone Accomplishments

STPNOC has installed the Spent Fuel Pool Level Instruments and fully implemented the Order in Unit 2. Full implementation of the Order in Unit 1 will be completed no later than prior to the start-up from Refueling Outage (1RE19), currently scheduled for the Fall 2015.

3. Milestone Schedule Status

There are a few changes to the status of the milestones in the integrated plan that were submitted in the last status report submitted on February 26, 2015 (Reference 9).

Unit 1 Milestones are as follows:

- Design/Engineering – complete
- Purchase of instruments & equipment – complete
- Receipt of equipment – complete
- Unit 1 Installation & Functional Testing – October 2015 with full implementation prior to the start-up from the Refueling Outage (1RE19).

Unit 2 implementation is complete as indicated in the Unit 2 compliance letter (Reference 12).

4. Changes to Compliance Method

There are no changes to the compliance method as documented in the Overall Integrated Plan. There are changes to STPNOC's earlier response to RAIs regarding qualification of the instrumentation (See Response to RAI-4a and RAI -7a).

5. Open Requests for Additional Information (RAIs)

See responses to information requested in Reference 6. The onsite NRC audit of STP's Spent Fuel Pool Level Instruments (SFPLI) implementation of the Order occurred the week of February 9, 2015. Three specific items remained open following the exit: RAI #1, RAI #2 and RAI #10. The responses to these RAIs have been revised and the NRC subsequently closed these three RAIs. In addition, responses to RAIs #4 and RAI #7 from the NRC's original set of RAIs (Reference 3) have been updated based on changes that were previously made to the design.

NRC RAI #1 (Reference 6)

In its letter dated June 25, 2013, the licensee provided a sketch depicting the waveguide piping for the two redundant channels as 1 in. stainless steel pipes. The NRC staff noted that this sketch depicts the two pipes to be run side by side from the through-the-air horn to the sensor receivers located in the Mechanical Auxiliary Building (MAB), and from there, cabling for the two instrument channels seem to be run side by side to the display units mounted in the Radwaste Control Room. The NRC staff has concerns regarding the routing of these two channels in accordance with the guidance on channel separation as described in NEI 12-02. Additional information is needed for the staff to complete its evaluation.

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 Radwaste Control Room 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.

STPNOC Response:

The response was provided in the last status update (Reference 9).

STPNOC considers the status of this item to be CLOSED.

NRC RAI #2 (Reference 6)

The NRC staff notes that the proposed application of such seismic design criteria appears to be reasonable and addresses the staff-endorsed NEI 12-02 guidance stating that the channel is to be designed to be consistent with the highest seismic or safety classification of the SFP. The licensee's proposed plan, with respect to the seismic design of the mounting, appears to be consistent with NEI 12-02, as endorsed by the ISG. The staff plans to verify the results of the licensee's seismic testing and analysis report when it is completed based on the licensee's response to the following RAI.

Please provide the analyses verifying that 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 that the SFP instrument design configuration will be maintained during and following the maximum seismic ground motion considered in the design of the SFP structure.

STPNOC Response:

The response was provided in the last status update (Reference 9).

STPNOC considers the status of this item to be CLOSED.

NRC RAI-4a (References 3 and 6)

RAI 4 in Reference 3 stated in part...

Please provide the following:

a) A description of the specific method or combination of methods you intend to apply to demonstrate the reliability of the permanently installed equipment under beyond-design-basis (BDB) ambient temperature, humidity, shock, vibration, and radiation conditions.

STPNOC Revised Response

See changes to STPNOC's response provided in Reference 4 regarding reliability of the equipment under Beyond Design Basis (BDB) humidity *in italics* below. This information was included in the NRC Interim Staff Evaluation (Reference 6):

Humidity

The maximum humidity postulated for the SFP room (*Fuel Handling Building*) is 100% relative humidity, essentially a saturated steam environment. The VEGA electronics will be located outside of the spent fuel pool room in an area away from the steam atmosphere. *The waveguide tube in the FHB can withstand condensation formed on the inside walls provided there is no pooling of the condensate in the waveguide tube. This is ensured by installing a weep hole(s) at the low spots in the wave guide pipe. Condensation build-up within the waveguide or horn assembly during a BDB event has been addressed by a design feature of the instrument. An approved horn cover has been attached to the horn assembly which prevents condensation from forming inside the waveguide during a BDB event. The waveguide system in the Fuel Handling Building is sealed from the effects of humidity changes and/or steam during a BDB. Once the waveguide exits the Fuel Handling Building into the Mechanical Auxiliary Building (MAB), the waveguide has four small holes where the sensor attaches to the waveguide, which are designed to prevent over-pressurization of the waveguide. With the addition of the transparent horn cover, there is no concern regarding condensation formation in the waveguide during the BDB event.* The ability of the radar to "see through" the steam has been demonstrated by test. In addition to testing, the VEGA Through Air Radar instrument has been used in numerous applications that involve measuring the level of boiling liquids.

STPNOC considers the status of this item to be CLOSED

NRC RAI-7a (References 3 and 6)

RAI 7 in Reference 3 stated in part...

Please provide the following:

a) An estimate of the expected instrument channel accuracy performance under both a) normal SFP level conditions (approximately Level 1 or higher) and b) at BDB conditions (i.e., radiation, temperature, humidity, post-seismic and post-shock conditions) that would be present if the SFP level were at the Level 2 and Level 3 datum points.

STPNOC Revised Response

See changes to STPNOC's response provided in Reference 4 regarding accuracy of the instruments under both normal and Beyond Design Basis (BDB) humidity *in italics* below. This information was included in the NRC Interim Staff Evaluation (Reference 6).

The reference accuracy for the instrument attaching a waveguide to the instrument for transmitting the signal and using water as a target at normal SFP level conditions has been demonstrated to be ± 1 inch based on testing. This is the design accuracy value that will be used for the SFPLI channels. This value is subject to change dependent on the actual performance with the installed waveguide.

The accuracy of the instrument channel is *not significantly affected* under BDB conditions (i.e., radiation, temperature, humidity, post-seismic and post-shock conditions). The stainless steel horn antenna and waveguide pipe that are exposed to BDB conditions are 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 delay 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. An approved horn cover has been attached to the horn assembly which prevents condensation from forming inside the waveguide during a BDB event which could affect the radar signal.* A minor effect 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 receiver to be located in mild environment conditions (i.e. the MAB) so that the effect of elevated temperature on sensor receiver accuracy is also limited. Based on the VEGA Operating Instruction Manual for the VEGAPuls 62ER instrument, a small correction factor is applied on the radar beam velocity to account for the impact of saturated steam at atmospheric pressure. Testing performed in saturated steam and saturated steam combined with smoke environments indicates that the overall effect on the instrument accuracy is minimal. The overall accuracy at BDB conditions is conservatively estimated to not exceed ± 3 inches, which is within the required ± 1 ft. described in NEI 12-02 (Reference 11).

STPNOC considers the status of this item to be CLOSED

NRC RAI #10 (Reference 6)

The NRC staff notes that the licensee will demonstrate the reliability of the seismic design and installation in accordance with NEI 12-02, as endorsed by the ISG. The licensee's planned approach with respect to the seismic reliability of the instrumentation appears to be consistent NEI 12-02, as endorsed by the ISG. However, the staff plans to verify the results of the licensee's seismic test when it is completed.

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 STP, has been adequately demonstrated.

STPNOC Revised Response:

The response was provided in the last status update (Reference 9).

STPNOC considers the status of this item to be CLOSED.

6. Need for Relief/Relaxation and Basis for the Relief/Relaxation

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

7. Potential Draft Safety Evaluation Impacts

None