



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

August 27, 2014
NOC-AE-14003164
10 CFR 2.202

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

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
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)

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) (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 (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 (ML13149A09)
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)
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)

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 (References 3 and 6) in regard to our Overall Integrated Plan. The purpose of this letter is to provide our third

STI 33909729

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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. This report also provides an update to the RAIs provided in Reference 6.

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 27, 2014



G. T. Powell
Site Vice President

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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) (ML12054A679)
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8. 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)
9. 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)
10. Sandia National Laboratories Document SAND-2008-6851P, "Radiation Hardness Assurance Testing of Microelectronic Devices and Integrated Circuits: Radiation Environments, Physical Mechanisms, and Foundations for Hardness Assurance", Page 20 and Figure 20
11. MIL-STD-883J, "Department of Defense Test Method Standard, Microcircuits"

12. STP Post Accident Radiation Zone Drawings 9M129A8118 & 9M129A81109 (UFSAR Figures 12.3.1-27 and 12.3.1-9)
13. STPNOC016CALC001, Spent Fuel Pool Instrumentation Radiological Evaluation per NEI 12-02 / ENERCON (STI 33888628)

Reference 2 provided the Overall Integrated Plan which the STP Nuclear Operating Company (STPNOC) will implement for Units 1 and 2 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 8) and NEI Report 12-02, Revision 1 (Reference 9). This attachment provides an update of milestone accomplishments since submittal of the status update (Reference 7) of the Overall Integrated Plan. This report also provides an update to information requested in Reference 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 third update of milestone accomplishments since submittal of the Overall Integrated Plan, including any changes to the compliance method and schedule. As discussed in Reference 1, any changes to the requirements in NRC JLD-ISG-2012-003 or NEI 12-02 may require relief from the requirements and schedule documented in the Overall Integrated Plan.

2. Milestone Accomplishments

STPNOC has purchased and received most of the components that make up the Spent Fuel Pool (SFP) level instruments for Unit 2. The design change packages are nearing completion for both Units. Full implementation of the order for Unit 2 will be completed no later than April 30, 2015, prior to the scheduled startup from Refueling Outage (2RE17). Full implementation of the order for Unit 1 will be completed no later than November 2, 2015, prior to the scheduled startup from Refueling Outage (1RE19).

3. Milestone Schedule Status

There are a few minor changes to the status of the milestones in the integrated plan that was submitted on February 27, 2014.

Unit 1 Milestones are as follows:

- Design/Engineering – November of 2014
- Purchase of instruments & equipment – February of 2015
- Receipt of equipment – June of 2015
- Unit 1 Installation & Functional Testing – October of 2015

Unit 2 Milestones are as follows:

- Design/Engineering – September of 2014
- Purchase of instruments & equipment – complete
- Receipt of equipment – October of 2014
- Installation & Functional Testing – November of 2014

4. Changes to Compliance Method

There are no changes to the compliance method as documented in the Overall Integrated Plan.

5. Open Requests for Additional Information (RAIs)

See responses to information requested in Reference 6 (NRC Interim Staff Evaluation and Request for Additional Information).

NRC RAI #3 (Reference 6)

The NRC staff has concerns with the licensee's lack of information regarding its analysis of the maximum expected radiological conditions for the Radwaste Control Room that might be considered credible under BDB conditions. The NRC staff is also concerned with the lack of documentation indicating how it was determined that the electronics can withstand a total integrated dose of 1×10^3 Rads.

Please provide analysis of the maximum expected radiological conditions (dose rate and total integrated dose) to which the equipment located within the Radwaste Control Room will be exposed. Also, please provide documentation indicating how it was determined that the electronics for this equipment is capable of withstanding a total integrated dose of 1×10^3 Rads. Please discuss the time period over which the analyzed total integrated dose was applied.

STPNOC Response:

The following response revises STPNOC's response provided in the last status update.

The electronic components associated with the panel (where the radar signal is converted to the milliamp signal and is sent to the indicators in the Radwaste Control Room) are shielded from the spent fuel pool area. STPNOC performed a Monte Carlo shielding calculation (MCNP) to determine the dose rate at the location of the electronics. The results indicate that the electronic components will not be exposed to an integrated dose greater than 1×10^3 Rads for a 7-day duration of the event with water level at level 3 (Reference 13).

The design basis dose rate for the Radwaste Control Room during normal operations is 2.5 mRem/hr; however, actual dose rates are < 1 mRem/hr. The Radwaste Control Room is physically separated from the operating deck of the Fuel Handling Building and the top of the spent fuel pool (with intervening concrete walls and floors providing radiation shielding). It is not expected that a postulated event in the spent fuel pool vicinity would result in an unacceptable increase in the dose rate in the Radwaste Control Room.

Dose rates used for testing electronics using MIL-STD-883J, Method 1019.9 (Reference 11) are 50 rad/second or greater. The fact that this standard test does not test for dose rates lower than 50 rad/second, except as explained below, indicates that dose rates that are lower than 50 rad/second are not a concern for electronic devices. At very low dose rates, some electronics that contain bipolar or BiCMOS or mixed-signal devices can be susceptible to Enhanced Low Dose Rate Sensitivity (ELDRS). For these devices MIL-STD-883J, Method 1019.9 also requires testing at low dose rate ≤ 0.01 Rad/second. However, Reference 11 shows that at dose levels up to 1×10^4 rad there are no true dose rate effects. Therefore, the total integrated dose estimated for the area where the electronics will be located, low dose rate sensitivity is not a concern.

Based on the information provided in the above references, the electronics in the VEGAPULS 62 ER sensor, displays and power control panel are considered to be qualified for the application at STP. See Reference 12 for radiation dose references.

STPNOC considers the status of this item CLOSED.

NRC RAI #11 (Reference 6)

The NRC staff notes that with this arrangement, the loss of one backup power supply will not affect the operation of the independent channel under BDB event conditions. The implementation of such design provisions appears to be consistent with NEI 12-02, as endorsed by the ISG, and the electrical functional performance of each level measurement channel would be considered independent of the other channel. However, the NRC staff plans to verify the final electrical power supply design information when it is provided.

Please provide the NRC staff with the final configuration of the power supply source for each channel so that the staff may conclude that the two channels are independent from a power supply assignment perspective.

STPNOC Response:

The following response revises STPNOC's response provided in the last status update. The change is highlighted in **bold**.

Unit 1 power supplies are provided; however, the power scheme is the same for Unit 2. The power cabinets will be normally powered by 120VAC Lighting Panels LP 13P and 13B.

LP 13P is powered from 480V Motor Control Center (MCC) 1L3. This MCC is powered from 480V Load Center (LC) 1L2. This LC is powered from **13.8 KV Bus 1G**.

LP 13B is powered from MCC 1S1. This MCC is powered from 480V LC 1S. LC 1S is powered from **a separate 13.8 KV Bus 1H**.

During a loss of normal power, the installed batteries in each cabinet will power the level instrumentation. See the following RAI#12 for more on these batteries.

STPNOC considers the status of this item **CLOSED**

NRC RAI #16 (Reference 6)

The NRC staff has concerns with the licensee's lack of information regarding the training of personnel for activities such as use of the instrument channels, provision for alternate power, and calibration and surveillance of the SFP instrumentation. Another staff concern is the lack of information on the licensee's approach to training with respect to the SFP instrumentation.

Please describe the activities for which personnel will be trained, such as use of the instrument channels, provision of alternate power, calibration and surveillance. Describe the approach to training used to identify the population to be trained and determined the initial and continuing elements of the required training for the SFP instrumentation.

STPNOC Response:

The Systematic Approach to Training will be used to determine what training is necessary for this modification. Operations and Maintenance will be trained as a minimum. Details of this training are still to be determined.

STPNOC considers the status of this item OPEN.

NRC RAI #17 (Reference 6)

The NRC staff has concerns with the licensee's lack of information about its plans to develop procedures. The staff previously requested this information as RAI-10 in NRC letter dated June 7, 2013. However, based on feedback from licensees, the staff revised this RAI as follows:

Please provide a list of procedures addressing operation (both normal and abnormal response), calibration, test, maintenance, and inspection procedures that will be developed for use of the spent SFP instrumentation. The licensee is requested to include a brief description of the specific technical objectives to be achieved within each procedure.

STPNOC Response:

STPNOC is revising the following Operating procedures to include the new spent fuel pool level instrumentation. The operations procedures are still under development. The maintenance, test & inspection procedures have not been developed.

| Procedure No. | Title | Technical Objectives |
|----------------------|--|--|
| 0POP12-ZO-FSG11 | Alternate SFP Makeup and Cooling | FLEX Support Guideline for providing alternate method (i.e., FLEX SFP makeup pump) for filling SFP during Extended Loss of AC Power event. Remote SFP level monitoring provided by new SFP level instrument. |
| 0POP02-FC-0001 | Spent Fuel Pool Cooling and Cleanup System | Remote SFP level instrument to be incorporated into normal operating procedure for the operation of the SFP Cooling and Cleanup system |
| 0POP02-FC-0003 | SFP and In Containment Storage Area (ICSA) Gate Operations | Remote SFP level instrument incorporated into normal operating procedure for SFP and ICSA gate/seal installation, removal, and operational checks |
| 0POP04-FC-0001 | Loss of Spent Fuel Pool Level or Cooling | Abnormal operating procedure for responding to SFP Hi/Lo levels or loss of cooling to SFP including identification of conditions for transition to Severe Accident Management Guidelines SCG-5 & SAG-9 and 0POP12-ZO-FSG11 |

| | | |
|----------------|---|--|
| 0POP09-AN-22M2 | Annunciator Lampbox 22M02 Response Instructions | Annunciator response procedure for Control Room Panel CP022 will have responses for the three SFP related annunciator alarm windows |
| 0PSP03-ZQ-0028 | Operator Logs | Plant Computer point for SFP level instrument to be added to Control Room Logsheets to ensure compliance with TS 3.9.11.1, SFP Water Level surveillance |
| SAG-9 | Refill the Spent Fuel Pool | Severe Accident Management Guide (SAMG) for mitigating severe accident in the Fuel Handling Building where spent fuel overheating and potential for fission product release exists |
| SCG-5 | Recover Spent Fuel Pool Level | Severe Accident Management Guide where spent fuel has been uncovered and potential for fission product release and hydrogen combustion exists |

STPNOC considers the status of this item OPEN.

NRC RAI #19 (Reference 6)

Please provide the following:

- a) Further information describing the maintenance and testing program the licensee will establish and implement to ensure that regular testing and calibration is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. Please include a description of your plans for ensuring that necessary channel checks, functional tests, periodic calibration, and maintenance will be conducted for the level measurement system and its supporting equipment.
- b) A description of how the guidance in NEI 12-02 Section 4.3 regarding compensatory actions for one or both non-functioning channels will be addressed.
- c) A description of what compensatory actions are planned in the event that one of the instrument channels cannot be restored to functional status within 90 days.

(This information was previously requested as RAI-11 in NRC letter dated June 7, 2013)

STPNOC Response:

- a) No update
- b) A new procedure is being developed that will list compensatory actions for non-functioning FLEX and Spent Fuel Pool Level Indication equipment.

- c) Both primary and backup SFP Level Indication channels incorporate permanent installation with no reliance on portable, post-event installation of relatively simple and robust augmented quality equipment. Permanent installation reasonably diminishes the likelihood that a single channel (and greatly diminishes the likelihood that both channels) is (are) out-of-service for an extended period of time. Planned compensatory actions for unlikely extended out-of-service events are summarized as follows:

| # Channel(s) Out-of-Service | Required Restoration Action | Compensatory Action if required restoration action not completed in specified time |
|---|--|---|
| 1 | Restore channel to functional status within 90 days (or if channel restoration not expected w/in 90 days, then proceed to Compensatory Action) | Initiate action in accordance with Note below |
| 2 | Initiate action within 24 hours to restore one channel to functional status and restore one channel to functional status w/in 72 hours | Initiate action in accordance with Note below |
| <p>Note: Present a report to the Plant Operations Review Committee within the following 14 days. The report shall outline the planned alternate method of monitoring, the cause of the non-functionality, and the plans and schedule for restoring the instrumentation channel(s) to functional status.</p> | | |

STPNOC considers the status of this item OPEN.

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