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RBG-47501

August 28, 2014

U.S. Nuclear Regulatory Commission
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SUBJECT: Entergy's Third 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)
River Bend Station – Unit 1
Docket No. 50-458
License No. NPF-47

RBF1-14-0124

- REFERENCES:
1. NRC Order Number EA-12-051, *Order To Modify Licenses With Regard To Reliable Spent Fuel Pool (SFP) Instrumentation*, dated March 12, 2012 (Agencywide Document Access and Management System (ADAMS) Accession No. ML12054A682) (RBC-51011)
 2. NRC Interim Staff Guidance JLD-ISG-2012-03, *Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation, Revision 0*, dated August 29, 2012 (ML12221A339)
 3. 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)
 4. Entergy's Initial Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated October 24, 2012 (RBG-47303) (ML12312A125)
 5. Entergy letter to NRC, *Overall Integrated Plan In Response To March 12, 2012, Commission Order Modifying License With Regard To Reliable SFP Instrumentation (Order Number EA-12-051)*, dated February 28, 2013 (RBG-47328) (ML13066A509)

A001
NRK

Dear Sir or Madam:

On March 12, 2012, the NRC issued an order (Reference 1) to Entergy. Reference 1 was immediately effective and directs Entergy to install reliable spent fuel pool level instrumentation at River Bend Station. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of an initial status report 60 days following issuance of the final interim staff guidance (Reference 2) and an overall integrated plan pursuant to Section IV, Condition C. Reference 1 also requires submission of a status report at six-month intervals following submittal of the overall integrated plan. Reference 3 provides direction regarding the content of the status reports. Reference 2 endorses industry guidance document NEI 12-02, Revision 1 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided the Entergy initial status report regarding spent fuel pool instrumentation. Reference 5 provided the Entergy overall integrated plan.

The purpose of this letter is to provide the third six-month status report pursuant to Section IV, Condition C.2, of Reference 1, that delineates progress made in implementing the requirements of Reference 1. The attached report provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any.

This letter contains no new regulatory commitments. Should you have any questions regarding this submittal, please contact Mr. Joseph Clark, Manager – Regulatory Assurance, at 225-381-4177.

I declare under penalty of perjury that the foregoing is true and correct; executed on August 28, 2014.

Sincerely,



EW0/JAC/dhw

Attachment: River Bend Station's (RBS) Third Six-Month Status Report for the Implementation of Order EA-12-051, Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation

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Attachment to

RBG-47501

**River Bend Station's (RBS) Third Six-Month Status Report for the Implementation of
Order EA-12-051, Order to Modify Licenses with Regard to Reliable Spent Fuel Pool
Instrumentation**

River Bend Station's (RBS) Third Six-Month Status Report for the Implementation of Order EA-12-051, Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation

1. Introduction

Entergy developed an Overall Integrated Plan (Reference 1 in Section 8) for River Bend Station (RBS), documenting the requirements to install reliable spent fuel pool level instrumentation (SFPI), in response to Reference 2. This attachment provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

2. Milestone Accomplishments

The following milestone(s) have been completed since January 31, 2014 and are current as of July 31, 2014.

- None.

3. Milestone Schedule Status

The following provides an update to milestone schedule to support the Overall Integrated Plan. This section provides the activity status of each item, and the expected completion date noting any change. The dates are planning dates subject to change as design and implementation details are developed.

| Milestone | Target Completion Date | Activity Status | Revised Target Completion Date |
|---|------------------------------|-------------------------|--------------------------------|
| Reliable SFPI Installed | Spring 2015 Refueling Outage | In Progress | N/A |
| Respond to NRC RAIs Dated July 3, 2013 (Reference 5) | July 26, 2013 | Submitted July 25, 2013 | N/A |
| Respond to NRC RAIs contained in Interim Staff Evaluation | September 30, 2014 | In Progress | N/A |

4. Changes to Compliance Method

There are no additional changes to the compliance method.

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

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

6. Open Items from Overall Integrated Plan and Interim Staff Evaluation

River Bend has received an Interim Staff Evaluation that includes 17 RAIs. Responses to the RAIs are due by September 30, 2014 and are provided in Section 9 of this six-month status report. The following table provides a status of any RAIs documented in the Interim Staff Evaluation.

| RAI # | Response Status |
|---------------------------|------------------------|
| 1 | See Section 9 |
| 2 | See Section 9 |
| 3 | See Section 9 |
| 4 | See Section 9 |
| 5 | See Section 9 |
| 6 | See Section 9 |
| 7 | See Section 9 |
| 8 | See Section 9 |
| 9 | See Section 9 |
| 10 | See Section 9 |
| 11 (Second #9 in ISE) | See Section 9 |
| 12 | See Section 9 |
| 13 | See Section 9 |
| 14 | See Section 9 |
| 15 (#11 in ISE) | See Section 9 |
| 16 (Second #12 in ISE) | See Section 9 |
| 17 (#16 in ISE) | See Section 9 |

7. Potential Interim Staff Evaluation Impacts

There are no potential impacts to the Interim Staff Evaluation identified at this time except for those identified in Section 6.

8. References

The following references support the updates to the Overall Integrated Plan described in this attachment.

1. "River Bend Station Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated February 28, 2013 (ML13066A509)
2. NRC Order Number EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012 (ML13066A509)
3. "River Bend Station, Unit 1 – Interim Staff Evaluation and Request for Additional Information Regarding Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) (TAC NO. MF0953)," dated November 25, 2013 (ML13316C065)
4. "Summary of the November 26, 2013, Public Meeting to Discuss Industry Responses to Staff Interim Evaluations for Spent Fuel Pool Instrumentation," dated December 26, 2013 (ML13347B030)
5. "River Bend Station, Unit 1-Request for Additional Information Regarding Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order EA 12-051) (TAC No. MF0953)" dated July 3, 2013 (ML13179A193)

9. Responses to the Interim Staff Evaluation Requests for Additional Information

RAI #1

Please provide the updated sketch or marked-up plant drawing of the SFP level instrumentation arrangement. Include the plan view of the SFP area, depicting the SFP inside dimensions, the planned locations/placement of the primary and back-up SFP level sensor, and the proposed routing of the cables that will extend from these sensors toward the location of the read-out/display device.

Figure 1 shows the approximate locations of the SFPI probes, the inside dimensions of the SFP, and the proposed cable routing.

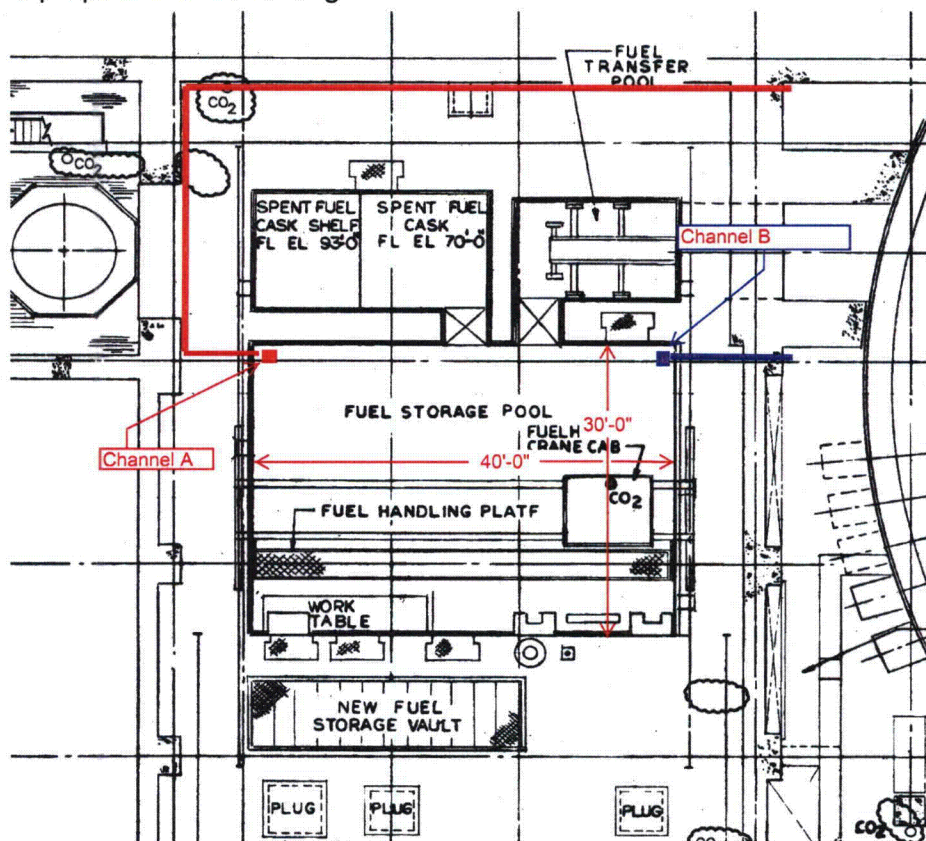


Figure 1: SFP Plan View

RAI #2

Please provide the analyses verifying that seismic testing of the sensor/probe assemblies and the electronics units, and the analysis of the combined maximum seismic and hydrodynamic forces on the cantilevered portion of the assembly exposed to the potential sloshing effects, show the SFP instrument design configuration will be maintained during and following the maximum seismic ground motion considered in the design of the SFP structure.

See bridging document Topics #8, 9, and 12. [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor (MOHR).]

RAI #3

For each of the mounting attachments required to attach SFP Level equipment to plant structures, please describe the design inputs, and the methodology that was used to qualify the structural integrity of the affected structures/equipment.

See bridging document Topics #8, 9, 12, and 13. [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor.]

RAI #4

Please provide analysis of the maximum expected radiological conditions (dose rate and total integrated dose) to which the sensor electronics (including power boxes, signal processors, and display panels) will be exposed. Also, please provide documentation indicating what is the maximum total integrated dose the sensor electronics can withstand and how it was determined. Please discuss the time period over which the analyzed total integrated dose was applied.

The display/processors will be located on the 98' elevation in the Control Building. As shown in Figure 12.3-2 in the River Bend USAR, this area is a Zone I radiation area with minimal radiation doses. The figure also shows that the Control Building is significantly far away from the Fuel Building, such that dose to the sensor electronics from lower pool levels does not need to be considered.

RAI #5

Please provide information indicating the maximum expected ambient temperature in the room in which the sensor electronics will be located under beyond design basis (BDB) conditions in which there is no ac power available to run Heating, Ventilation, and Air Conditioning (HVAC) systems, and whether the sensor electronics is capable of continuously performing its required functions under this expected temperature condition.

See bridging document Topic #3. [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor.]

RAI #6

Please provide information indicating the maximum expected relative humidity in the room in which the sensor electronics will be located under BDB conditions, in which there is no ac power available to run HVAC systems, and whether the sensor electronics is capable of continuously performing its required functions under this expected humidity condition.

See bridging document Topic #3. [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor.]

RAI #7

Please provide a description of the specific method or combination of methods you intend to apply to demonstrate the reliability of the permanently installed equipment under BDB shock and vibration conditions.

See bridging document Topic #14. [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor.]

RAI #8

For RAI #7 above, please provide the results for the selected methods, tests, and analyses used to demonstrate the qualification and reliability of the installed equipment in accordance with the Order requirements.

See bridging document Topic #14. [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor.]

RAI #9

Please provide analysis of the vendor analysis and seismic testing results and show that SFP level instrument performance reliability, following exposure to simulated seismic conditions representative of the environment anticipated for the SFP structures at River Bend, has been adequately demonstrated.

See bridging document Topics #8, 9, and 12. [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor.]

RAI #10

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

The indication module for each channel will be powered from a 120/240VAC lighting panel, with one lighting panel for each channel module. Each lighting panel is powered from a separate 480VAC bus. Channel A receives power from 120/240VAC lighting panel 1LAC-PNL1C1 BKR #8. Channel B receives power from 120/240VAC lighting panel 1LAC-PNL1C2 BKR #8. The 120VAC power supplies for each channel are separated, coming from independent lighting panels derived from separate distribution transformers and upstream 480VAC buses.

RAI #11 (second RAI #9 in ISE)

Please provide the results of the calculation depicting the battery backup duty cycle requirements demonstrating battery capacity is sufficient to maintain the level indication function until offsite resource availability is reasonably assured.

See bridging document Topic #18. [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor.]

RAI #12

Please provide analysis verifying the proposed instrument performance is consistent with these estimated accuracy normal and BDB values. Please demonstrate the channels will retain these accuracy performance values following a loss of power and subsequent restoration of power.

See bridging document Topics #16, 17, and 18. [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor.]

RAI #13

Please provide a description of the methodology to be used for determining the maximum allowed deviation from the instrument channel design accuracy under normal operating conditions. The NRC staff understands this allowed deviation will serve as an acceptance criterion for a calibration procedure to alert operators and technicians that the channel requires adjustment to within normal design accuracy.

In general relative to normal operating conditions, any applicable calibration procedure tolerances (or acceptance criterion) will be established based on the vendor manuals stated/recommended reference accuracy (or design accuracy). The methodology used will be based on the vendor manuals and captured in plant procedures and/or programs. See bridging document Topic #20. [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor.]

RAI #14

Please provide a description of the in-situ calibration process at the SFP location that will result in the channel calibration being maintained at its design accuracy.

The process will be captured in Entergy procedures established based on manufacturer's recommendations and Entergy processes and procedures. The instrument automatically monitors the integrity of its level measurement system using in-situ capability. Deviation of measured test parameters from manufactured or as-installed configuration beyond a configurable threshold prompts operator intervention. See bridging document Topic #20. [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor.]

RAI #15 (RAI #11 in ISE)

For the SFP level instrumentation displays located outside the main control room, please describe the evaluation used to validate the display location can be accessed without unreasonable delay following a BDB event. Include the time available for personnel to access the display as credited in the evaluation, as well as the actual time (e.g., based on walk-throughs) that it will take for personnel to access the display. Additionally, please include a description of the radiological and environmental conditions on the paths personnel might take. Describe whether the display location remains habitable for radiological, heat and humidity, and other environmental conditions following a BDB event. Describe whether personnel are continuously stationed at the display or monitor the display periodically.

The primary and backup SFPI displays will be located in the Control Building EL. 98'-0" west hallway. Either stairway on the west side of the building can be used to access the displays from the Main Control Room. The panels can be approached from the north, east, and south via various doors. The panels are deemed promptly accessible due to the short distance between the Main Control Room and the location of the display panels. The panels are located two elevations below the Main Control Room in the Control Building.

The impact to habitability would be primarily from elevated temperatures, as the 98' elevation of the Control Building is considered a mild radiation environment. Habitability will be assured by heat stress countermeasures and rotation of personnel to the extent feasible. Personnel will not be continuously stationed at the backup display, it will be monitored periodically. The site FLEX Support Guidelines will provide guidance for personnel to evaluate the room temperature and take actions as necessary. In addition, site procedures already use passive cooling technologies for response personnel.

The FLEX staffing plan has not been finalized at this time. The results of the staffing plan will be included in a future six month status report.

If necessary, portable radios will be used to communicate with decision makers.

RAI #16 (Second RAI #12 in ISE)

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

The calibration and test procedure developed by MOHR is provided in the technical manual (See bridging document Topics #10, 19, and 20) [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor.] The objectives are to measure system performance, determine if there is a deviation from normal tolerances, and return the system to normal tolerances.

Diagnostic procedures developed by MOHR are provided as automated and semi-automated routines in system software alerting the operator to abnormal deviation in selected system parameters such as battery voltage, 4-20 mA loop continuity, and TDR waveform of the transmission cable. The technical objective of the diagnostic procedures is to identify system conditions that require operator attention to ensure continued reliable liquid level measurement. Manual diagnostic procedures are also provided in the event that further workup is determined to be necessary.

Maintenance procedures developed by MOHR are provided in the technical manual. These allow a technician trained in EFP-IL system maintenance to ensure that system functionality is maintained.

An operating procedure will provide sufficient instructions for operation and use of the system.

Entergy procedures will be developed in accordance with the vendor manuals provided by MOHR and Entergy procedures and processes.

FLEX Support Guidelines will provide sufficient instructions for use of the SFPI during a beyond design basis external event.

RAI #17 (RAI #16 in ISE)

Please provide 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; Include a description of 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.

SFPI channel/equipment maintenance/preventative maintenance and testing program requirements to ensure design and system readiness will be established in accordance with Entergy's processes and procedures and in consideration of vendor recommendations to ensure that appropriate regular testing, channel checks, functional tests, periodic calibration, and maintenance are performed (and available for inspection and audit). See bridging document Topics #10 and 20. [Note: Preliminary responses are available in the draft bridging document, which will be finalized upon issuance of the NRC audit report for the SFPI vendor.]