

February 26, 2014

ULNRC-06088

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

10 CFR 2.202

Ladies and Gentlemen:

**DOCKET NUMBER 50-483  
CALLAWAY PLANT UNIT 1  
UNION ELECTRIC CO.  
FACILITY OPERATING LICENSE NPF-30  
SECOND 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)**

- References:
1. Letter dated March 12, 2012 from E. J. Leeds and M. R. Johnson, USNRC, to Adam C. Heflin, Callaway Plant, Union Electric Company, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation" (ADAMS Accession No. ML12056A044)
  2. NRC Interim Staff Guidance JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," Revision 0, August 29, 2012 (ADAMS Accession No. ML12221A339)
  3. ULNRC-05925, "Initial Status Report in Response to March 12, 2012 Commission Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation," dated October 29, 2012
  4. ULNRC-05960, "Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation," dated February 28, 2013
  5. ULNRC-06026, "First Six-Month Status Report In Response to March 12, 2012 Commission Order Modifying Licenses With Regard To Reliable Spent Fuel Pool Instrumentation," dated August 29, 2013

On March 12, 2012, the U. S. Nuclear Regulatory Commission (NRC) issued an order identified above as Reference 1 to Union Electric Company (dba Ameren Missouri) for Callaway Plant. Reference 1 was immediately effective and directs Ameren Missouri to have a reliable indication of water level in associated spent fuel storage pools. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of an initial status report 60 days following issuance of final interim staff guidance from the NRC (Reference 2) and an overall integrated plan pursuant to Section IV, Condition C. Reference 3 provided Ameren Missouri's initial status report regarding reliable spent fuel pool instrumentation. Reference 4 provided Ameren Missouri's Overall Integrated Plan.

Section IV, Condition C.2 of Reference 1 requires submission of a status report at six-month intervals following submittal of the overall integrated plan. NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," provides direction regarding the content of the status reports. Reference 5 provided Ameren Missouri's first six-month status report. The enclosure to this letter provides Ameren Missouri's second six-month status report pursuant to Section IV, Condition C.2 of Reference 1.

This letter does not contain new commitments.

If you have any questions concerning the content of this letter, please contact Scott Maglio, Regulatory Affairs Manager, at 573-676-8719.

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

Sincerely,

Executed on: 2/26/14



Cleveland Reasoner  
Vice President, Nuclear Operations

Enclosure: Ameren Missouri's Second Six-Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation

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## **Ameren Missouri's Second Six Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation**

### **1 Introduction**

Ameren Missouri developed an Overall Integrated Plan (OIP) (Reference 1) for the Callaway Plant, documenting the requirements to install reliable Spent Fuel Pool Level Instrumentation System (SFPLIS), in response to NRC Order EA-12-051 (Reference 2). This enclosure provides an update of milestone accomplishments since the last update submittal of the last status report (Reference 5), including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any. Refer to Section 8 of this enclosure for a list of References.

### **2 Milestone Accomplishments**

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

- Ameren Missouri's response to the June 7, 2013 NRC Request for Additional Information (RAI) Letter
- Submittal of the second six-month status report for implementation of order EA-12-051 (this document)

### **3 Milestone Schedule Status**

The following table provides an update of the milestone schedule provided in the SFPLIS OIP to the NRC (Reference 1). The table provides the activity status of each item, and the expected completion date noting any changes. The dates are planning dates subject to change as design and implementation details are developed.

The milestone schedule was revised to add typical milestones as listed in the NEI update template, and receipt of the NRC Interim Staff Evaluation (ISE) and Request for Additional Information (RAI) dated November 25, 2013 (Reference 6). The target completion date format was changed from XQYYYY to Month and Year format to be consistent with the FLEX Order (EA-12-049) format. There were no other changes to the target completion dates in the milestone schedule table.

<b>Milestone</b>	<b>Target Completion Date</b>	<b>Activity Status</b>	<b>Revised Target Completion Date</b>
Submit 60 Day Status Report	Oct 2012	Complete	
Submit Overall Integrated Plan	Feb 2013	Complete	
<b>Submit 6 Month Updates:</b>			
Update 1	Aug 2013	Complete	
Update 2	Feb 2014	Complete	
Update 3	Aug 2014	Not Started	
<b>Modifications:</b>			
Modifications Evaluation	Feb 2013	Complete	
Commence Engineering and Design	Mar 2013	Completed	
Complete Design	Dec 2013	Started	June 2014
Receipt of SFP Instruments	Apr 2014	Not Started	
<b>Procedures:</b>			
Create Procedures (Note 1)	Sep 2014	Started	
<b>Training:</b>			
Develop Training Plan	Aug 2014	Started	
Complete SFP Instrumentation Procedures & Training	Sep 2014	Started	
<b>RAI Response:</b>			
RAI Response (Note 2)	Jun 2013	Completed	
ISE RAI Response (Note 3)	Mar 2014	Started	
SFP Instruments Operational	Nov 2014	Not Started	
Submit Completion Report	Dec 2014	Not Started	

Note 1: Includes Maintenance Procedures.

Note 2: The RAI referred to here is the NRC's Request for Additional Information (RAI) concerning the Overall Integrated Plan in response to Order EA-12-051 (Reference 3). Reference 4 provided Ameren Missouri's response to the RAI.

Note 3: The RAI's referred to here are from the NRC Interim Staff Evaluation (ISE) and Request for Additional Information (RAI) concerning Overall Integrated Plan In Response To Order EA-12-051, Reliable Spent Fuel Pool Instrumentation (Reference 6).

## **4 Changes to Compliance Method**

The following changes have been made to Ameren Missouri's SFPLIS OIP response documented in Reference 1 since submittal of the last status report (Reference 5).

### **4.1 Wireless Technology**

The Ameren Missouri SFPLIS OIP (Reference 1) identified that wireless technology would be utilized. Upon further review and evaluation during the design phase, Ameren Missouri has elected to hard wire the system and forego use of the wireless technology.

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

Ameren Missouri expects to comply with the order implementation date and no relief/relaxation is anticipated at this time.

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

The following tables provide a summary of the open items documented in the Overall Integrated Plan or the Interim Staff Evaluation (ISE) and the status of each item.

Overall Integrated Plan Open Item	Status
None	

Interim Staff Evaluation Open Items (Note 1)	Status
<p>RAI No.1</p> <p>Please provide the results of the calculation used to determine the water elevation that is sufficient for the pump's required NPSH so the NRC staff may confirm that Level 1 has been adequately identified.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No.2</p> <p>Please clarify whether this wireless communications system will be used as two separate point-to-point wireless communications systems (i.e., one system between the sending unit and receiver for the primary level channel and a second system between the sending unit and receiver for the back-up level channel), or whether there will be shared communications channels over which both the primary and the backup channels can communicate simultaneously. Also, please verify whether there are other wireless communication devices within the plant that will be allowed to share this wireless communications system.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No.3</p> <p>Please provide a plant-specific evaluation of the interaction of the proposed wireless technology with other plant systems, in particular, interactions and any malfunctions that could result from potential failure modes of one channel, or due to Beyond Design Basis (BDB) conditions.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No.4</p> <p>Please provide additional information describing how the proposed arrangement and routing of the cables meet 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.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>



Interim Staff Evaluation Open Items (Note 1)	Status
<p>RAI No.5</p> <p>Please clarify if a stilling well is part of the instrument design and, if so, how its weight is accounted for and how it will be mounted and analyzed.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No.6</p> <p>Please provide the results of the analyses used to verify the design criteria and methodology for seismic testing of the SFP instrumentation and the electronics units, including design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No.7</p> <p>For each of the mounting attachments required to fasten SFP level equipment to plant structures, please describe the design inputs and the methodology that will be used to qualify the structural integrity of the affected structures/equipment.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No.8</p> <p>Please describe the quality assurance process to be used to meet the augmented quality requirements identified in the Order.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No.9</p> <p>Please provide an analysis of the maximum expected radiological conditions (dose rate and total integrated dose) to which the transmitter electronics will be exposed. Provide documentation indicating the cumulative (total integrated) radiological dose the electronics for this equipment are capable of withstanding. Discuss the time period over which the analyzed total integrated dose was applied.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>

Interim Staff Evaluation Open Items (Note 1)	Status
<p>RAI No. 10</p> <p>Please provide information indicating a) the temperature ratings for all system electronics (including sensor electronics, system electronics, transmitter, receiver and display) and whether the ratings are continuous duty ratings; and, b) the maximum expected temperature in the room(s) in which the sensor electronics will be located under BDB conditions, with no ac power available to run Heating, Ventilation, and Air Conditioning (HVAC) systems.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No. 11</p> <p>Please provide information indicating the maximum expected relative humidity in the room in which the sensor electronics will be located under BDB conditions, with no ac power available to run HVAC systems, and whether the sensor electronics are capable of continuously performing required functions under this expected humidity condition.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No. 12</p> <p>Please provide the following:</p> <p>Information describing the evaluation of the sensor electronics design, the shock test method, test results, and forces applied to the sensor electronics applicable to successful tests demonstrating the testing provides an appropriate means to demonstrate reliability of the sensor electronics under the effects of severe shock.</p> <p>Information describing the evaluation of the sensor electronics design, the vibration test method, test results, forces and their frequency ranges, and directions applied to the sensor applicable to successful tests demonstrating the testing provides an appropriate means to demonstrate reliability of the sensor electronics under the effects of high vibration.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>

Interim Staff Evaluation Open Items (Note 1)	Status
<p>RAI No. 13</p> <p>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 Callaway, has been adequately demonstrated. Include information describing the design inputs and methodology used in any analyses of the mounting of electronic equipment onto plant structures, as requested in RAI No. 7 above.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No. 14</p> <p>Please provide the NRC staff with the final configuration of the power supply source for each channel so the staff may conclude the two channels are independent from a power supply assignment perspective.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No.15</p> <p>Please provide the results of the calculation depicting the battery backup duty cycle requirements demonstrating that battery capacity is sufficient to maintain the level indication function until offsite resource availability is reasonably assured.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No.16</p> <p>Please provide the following:</p> <p>An estimate of the expected instrument channel accuracy performance (e.g., in percent of span) under both a) normal SFP level conditions (approximately Level 1 or higher) and b) at the 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.</p> <p>A description of the methodology used for determining the maximum allowed deviation from the instrument channel design accuracy under normal operating conditions, which would be used as an acceptance criterion for a calibration procedure to alert operators and technicians that the channel requires adjustment to within normal design accuracy.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>

Interim Staff Evaluation Open Items (Note 1)	Status
<p>RAI No.17</p> <p>Please provide the following:</p> <p>A description of the capability and provisions the proposed level sensing equipment will have to enable periodic testing and calibration, including how this capability enables the equipment to be tested in-situ.</p> <p>A description of the way such testing and calibration will enable the conduct of regular channel checks of each independent channel against the other, and against any other permanently-installed SFP level instrumentation.</p> <p>A description of the functional checks to be performed, and the frequency at which they will be conducted. Describe how calibration tests will be performed, and the frequency at which they will be conducted. Discuss how these surveillances will be incorporated into the plant surveillance program.</p> <p>A description of the preventive maintenance tasks required to be performed during normal operation, and the planned maximum surveillance interval that is necessary to ensure that the channels are fully conditioned to accurately and reliably perform their functions when needed.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No. 18</p> <p>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.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>

Interim Staff Evaluation Open Items (Note 1)	Status
<p>RAI No.19</p> <p>Please provide the following:</p> <p>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 to ensure that necessary channel checks, functional tests, periodic calibration, and maintenance will be conducted for the level measurement system and its supporting equipment.</p> <p>A description of the compensatory actions to be taken in the event that one or both channels are non-functioning, as described in the guidance in NEI12-02 section 4.3.</p> <p>A description of the planned compensatory actions to be taken when one of the instrument channels cannot be restored to functional status within 90 days.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>
<p>RAI No. 20</p> <p>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.</p>	<p>Working (note that information will be submitted by March 31, 2014, as required by Ref. 6)</p>

Note 1: An Interim Staff Evaluation has been received from the NRC (Reference 6).

## 7 Potential Interim Staff Evaluation Impacts

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

## 8 References

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

1. ULNRC-05960, "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.
2. NRC Order EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012.
3. Letter dated June 7, 2013 from C. F. Lyon, USNRC to A. C. Heflin, Union Electric Company, "Callaway Plant, Unit 1 - Request for Additional Information RE: Overall Integrated Plan in

Enclosure  
to ULNRC-06088

Response to Order EA-12-051, 'Reliable Spent Fuel Pool Instrumentation' (TAC NO. MF0773)"  
(ADAMS Accession No. ML13121A187)

4. ULNRC-06008, "Response to Request for Additional Information With Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated July 3, 2013
5. ULNRC-06026 First Six Month Status Report In Response To March 12, 2012 Commission Order Modifying Licenses With Regard To Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated August 29, 2013
6. ML13323A111, Callaway Plant, Unit 1 - Interim Staff Evaluation And Request For Additional Information Re: Overall Integrated Plan In Response To Order EA-12-051, Reliable Spent Fuel Pool Instrumentation (TAC NO. MF0773), dated November 25, 2013