Ameren Missouri's Third 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 a 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 OIP (Reference 9), 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 August 19, 2014.

- Commence Engineering and Design - Complete
- Ameren Missouri's response to the June 7, 2013 NRC Request for Additional Information (RAI) Letter (Reference 4)
- Submittal of first six-month status report (Reference 5)
- Modification Evaluations - Complete
- Submittal of second six-month status report (Reference 9)
- Ameren Missouri's Response to the NRC Request for Additional Information (RAI) Letter (submitted on the STARS e-Portal)
- Complete Design - Complete
- Develop Training Plan - Complete
- SFP Instrumentation Training - Complete
- Submittal of the third six-month status report (this submittal)

3 Milestone Schedule Status

The following table provides an update of the milestone schedule provided in the SFPLIS OIP to the NRC. The table provides the activity status of each item, as well as the expected completion date, noting any changes. The dates are planning dates subject to change as design and implementation details are developed. The milestone target completion dates have been revised based on approval of the relaxation request discussed in Section 5. Italicized text denotes that a Milestone was updated since the last six-month status update (Reference 9).

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Submit 60 Day Status Report	Oct 2012	Complete	
Submit Overall Integrated Plan	Feb 2013	Complete	
Submit 6 Month Updates			
Update 1	Aug 2013	Complete	
Update 2	Feb 2014	Complete	
Update 3	*Aug 2014*	*Complete*	
Update 4	*Feb 2015*	*Not Started*	
Update 5	*Aug 2015*	*Not Started*	
Update 6	*Feb 2016*	*Not Started*	
Modifications			
Modifications Evaluation	Feb 2013	Complete	
Commence Engineering and Design	Mar 2013	Complete	
Complete Design	*Dec 2013*	*Complete*	
Receipt of SFP Instruments	*Apr 2014*	*Started*	*Sep 2014*
Procedures			
Create Procedures (Note 1)	*Sep 2014*	*Started*	*Nov 2014*
Training			
Develop Training Plan	*Aug 2014*	*Complete*	
Complete SFP Instrumentation Training (Deleted procedures, see Procedures above)	*Sep 2014*	*Complete*	
RAI Response			
RAI Response (Note 2)	Jun 2013	Complete	
ISE RAI Response (Note 3)	*Mar 2014*	*Complete*	
SFP Instruments Operational	Nov 2014	Not Started	
Submit Completion Report	*Dec 2014*	*Not Started*	*Jul 2016*

Note 1: Includes Maintenance Procedures.

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

Note 3: The RAI referred to here are from the NRC Interim Staff Evaluation (ISE) and Request for Additional Information concerning Overall Integrated Plan in Response to Order EA-12-051 (Reference 6). Ameren Missouri's response was submitted on the STARS e-Portal.

4 Changes to Compliance Method

In Section VII, Arrangement, of the Overall Integrated Plan submitted via ULNRC-05960 (Reference 1), the primary system indicator location has been changed from "in the vicinity of the control room" to the MG Set Room in the Auxiliary Building (Room 1403). This room will be accessible to the operators following an event.

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

Ameren Missouri requested via ULNRC-06036 (Reference 7) and received approval as documented in ML13319A668 (Reference 8) for relaxation of FLEX implementation per NRC Order EA-12-049 until the completion of Refuel 21 (Spring 2016). FLEX implementation is required to comply with the power supply requirement described in NRC Order EA-12-051, Attachment 2, Section 1.6. Based on the approval of the relaxation request, AmerenMissouri submitted ULNRC-06113 (Reference 10) and ULNRC-06119 (Reference11), to request relaxation of the power supply requirement described in NRC Order EA-12-051, Attachment 2, Section 1.6. This relaxation was approved by the NRC per ML14154A400 (Reference 12).

6 Open Items from Overall Integrated Plan and Interim Safety Evaluation

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

Overall Integrated Plan Open Item	Status
None	

Interim Staff Evaluation Request for Additional Information (Note 1)	Status
RAI No.1 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.

Interim Staff Evaluation Request for Additional Information (Note 1)	Status
RAI No.2 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No.3 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 BDB conditions.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No.4 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No.5 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No.6 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.

Interim Staff Evaluation Request for Additional Information (Note 1)	Status
RAI No.7 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No.8 Please describe the quality assurance process to be used to meet the augmented quality requirements identified in the Order.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No.9 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No. 10 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 BOB conditions, with no ac power available to run Heating, Ventilation, and Air Conditioning (HVAC) systems.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No. 11 Please provide information indicating the maximum expected relative humidity in the room in which the sensor electronics will be located under BOB 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.

Interim Staff Evaluation Request for Additional Information (Note 1)	Status
RAI No. 12 Please provide the following: 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. 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No. 13 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No. 14 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No.15 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.

Interim Staff Evaluation Request for Additional Information (Note 1)	Status
RAI No.16 Please provide the following: 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. 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No.17 Please provide the following: 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. 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. 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. 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.

Interim Staff Evaluation Request for Additional Information (Note 1)	Status
RAI No. 18 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6. The procedures have not yet been developed. A brief description of the specific technical objectives to be achieved within each procedure will be provided with the next 6 month update submittal.
RAI No.19 Please provide the following: 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. 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. 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.
RAI No. 20 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.	Requested information was submitted on the STARS e-Portal by March 31, 2014, as required by Reference 6.

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

7 Potential Interim Safety Evaluation Impacts

There are no potential impacts to the Interim Safety 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 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
7. ULNRC-06036, "Request For Relaxation From NRC Order EA-12-049, "Order Modifying Licenses With Regard To Requirements For Mitigation Strategies For Beyond-Design-Basis External Events," dated October 09, 2013
8. ML13319A668, "Callaway Plant, Unit 1- Relaxation Of The Schedular Requirements For Order EA-12-049 Issuance Of Order To Modify Licenses With Regard To Requirements For Mitigation Strategies For Beyond Design Basis External Events," dated December 11, 2013
9. ULNRC-06088, "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)," dated February 26, 2014
10. ULNRC-06113, "Request For Relaxation From NRC Order EA-12-051, "Order Modifying Licenses With Regard To Reliable Spent Fuel Pool Instrumentation," dated April 17, 2014
11. ULNRC-06119, "Supplement to Request For Relaxation From NRC Order EA-12-051, "Order Modifying Licenses With Regard To Reliable Spent Fuel Pool Instrumentation," dated May 8, 2014
12. ML14154A400, "Callaway Plant, Unit 1 - Relaxation Of The Schedule Requirements For Order EA-12-051, "Order Modifying Licenses With Regard To Reliable Spent Fuel Pool Instrumentation," dated June 26, 2014