Ameren MISSOURI

Callaway Plant

February 26, 2014

ULNRC-06087

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 REQUIREMENTS
FOR MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS
EXTERNAL EVENTS (ORDER NUMBER EA-12-049)

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 Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession Number ML12054A736)

2. NRC Interim Staff Guidance JLD-ISG-2012-01, Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, Revision 0, August 29, 2012 (ADAMS Accession Number ML12229A174)

3. ULNRC-05924, "Initial Status Report in Response to March 12, 2012 Commission Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated October 29, 2012

4. ULNRC-05962, "Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated February 28, 2013

5. ULNRC-06024, "First Six-Month Status Report In Response to March 12, 2012 Commission Order Modifying Licenses With Regard To Requirements For Mitigation Strategies For Beyond-Design-Basis External Events (Order Number EA-12-049)," dated August 29, 2013

On March 12, 2012, the U. S. Nuclear Regulatory Commission (NRC) issued the 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 develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event. 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 mitigation strategies. 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 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," 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-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events

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Ameren Missouri's Second Six-Month Status Report for the Implementation of Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events

1 Introduction

Ameren Missouri developed an Overall Integrated Plan (OIP) (Reference 1) for the Callaway Plant, documenting the diverse and flexible strategies (FLEX), in response to NRC Order Number EA-12-049 (Reference 2). This enclosure provides an update of milestone accomplishments since submittal of the last status report (Reference 3), 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 the development of the OIP (Reference 1), and are current as of January 31, 2014.

- Modification Evaluations have been completed.
- Submittal of the second six-month status report for implementation of order EA-12-049 (this document)

3 Milestone Schedule Status

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

Ameren Missouri submitted a relaxation request per ULNRC-06036 (Reference 4) which was approved by the NRC (Reference 5). Several completion dates, such as the completion date for "Unit 1 Implementation Date" and "Submit Completion Report", have been revised accordingly. Further information concerning this relaxation request is provided in Section 5 of this enclosure.

Callaway Milestone Schedule			
Activity	**Original Target Date**	**Status (Will be updated every 6 months)**	**Revised Target Completion Date**
Submit Overall Integrated Implementation Plan	February-2013	Complete	
6 Month Status Updates			
Update 1	August-2013	Complete	
Update 2	February-2014	Complete	
Update 3	August-2014	Not Started	
Update 4	February-2015	Not Started	
Update 5	August-2015	Not Started	
Update 6	February-2016	Not Started	
FLEX Strategy Evaluation	April-2013	Complete	
Perform Staffing Analysis	December-2013	Not Started	December-2015
Modifications			
Modifications Evaluation	April-2013	Complete	
Engineering and Implementation	November-2014	Started	May-2016
N-1 Walkdown	April-2013	Started	December-2014
Design Engineering	March-2014	Started	February-2015
Unit 1 Implementation Outage	November-2014	Not Started	May-2016
On-site FLEX Equipment			
Purchase	June-2013	Started	March-2015
Procure	December-2013	Started	April-2015
Off-site FLEX Equipment			
Develop Strategies with RRC	November-2013	Started	September-2014
Install Off-site Delivery Station (if necessary)	September-2014	Started	
Procedures			
PWROG issues NSSS-specific guidelines	June-2013	Complete	
Create Callaway FSG	April-2014	Started	April-2015
Create Maintenance Procedures	June-2014	Not Started	June-2015
Training			
Develop Training Plan	April-2014	Started	
Implement Training	May-2014	Started	May-2016
Submit Completion Report	November-2014	Not Started	June-2016

4 Changes to Compliance Method

The following changes have been made to Ameren Missouri's FLEX response documented in Reference 1 since submittal of the last status report (Reference 3).

4.1 Shutdown/Refueling Modes

Ameren Missouri will incorporate the supplemental guidance provided in the NEI position paper (Reference 6) entitled "Shutdown / Refueling Modes" to enhance the shutdown risk process and procedures.

4.2 RWST Missile Protection

The Ameren Missouri FLEX response (Reference 1) identified that the Refueling Water Storage Tank (RWST) required missile protection to be credited for FLEX Strategies. Upon further review, it has been determined that the RWST does not require missile protection.

The makeup from the RWST is required for implementation of the FLEX Strategies at Callaway in Modes 1 – 4 no later than 46 hours after the event (Reference 1, Table C-1: Timing and Deployment Timeline; Steam Generators Available (MODES 1-4). After 46 hours, the Regional Response Center (RRC) would have delivered a mobile boration skid that can be used provide RCS makeup/boration from the Ultimate Heat Sink (UHS) or Hardened Condensate Storage Tank (HCST) (i.e., seismic & missile hardened sources). Based upon this RCS makeup rate, the RWST does not require missile hardening for MODES 1-4.

For Shutdown/Refueling Modes Ameren Missouri will incorporate the supplemental guidance provided in the NEI position paper (Reference 6) entitled "Shutdown / Refueling Modes". Per NEI Frequently Asked Questions (FAQ) 2013-10, Shutdown Mode Capability Requirements for PWRs, the RWST (borated water source) does not need to be robust for all external events. The RWST is seismically qualified but is not missile protected. Ameren Missouri will implement appropriate risk management techniques such as pre-staging FLEX equipment to minimize the potential impact of an event. Since the RWST is seismically qualified, there is not an issue for a seismic event. The only issue for the RWST would be severe weather (tornado). For this type severe weather there is significant time to implement contingency plans to mitigate the consequences of such an event. In addition, Ameren Missouri has procedures in place to monitor severe weather in times of high risk evolutions during outages.

4.3 Battery Service Life

Ameren Missouri has performed a battery service life calculation and determined our batteries would be able to provide instrument and control power for approximately 14 – 15 hours after a loss of all AC power. Ameren Missouri confirms that the FLEX strategy station battery run-time was calculated in accordance with the IEEE-485 methodology using manufacturer discharge test data applicable to the licensee's FLEX strategy as outlined in the NEI white paper on Extended Battery Duty Cycles. The detailed licensee calculations, supporting vendor discharge test data, FLEX strategy battery load profile, and other inputs/initial conditions required by IEEE-485 will be available on the licensee's web portal for documents and calculations. The time margin between the calculated station battery run-time for the FLEX strategy and the expected deployment time for FLEX equipment to supply the dc loads is at least four (4) hours.

4.4 Spent Fuel Pool Cooling

The three connections (primary, secondary, and spray) for the Spent Fuel Pool Cooling strategy were originally designed to be external to the Fuel Building. Further evaluation determined that it would be cost prohibitive to design and construct a hardened structure external to the Fuel Building to protect these connections. Consequently, the strategy has been revised to place these connections just inside the building. An evaluation determined that the connection points would accessible early in the event.

In addition, Ameren Missouri has decided not to pursue use of a SFP Cooling System from the Regional Response Centers (RRC). The 4160 VAC generators being procured from the RRC will not be able to supply sufficient power to include the Spent Fuel Pool Cooling Pumps in the supplied loads. Ameren Missouri will be obtaining a spare SFP Cooling (FLEX) Pump from the RRC.

4.5 Non-Class 1E Instrumentation

For non-Class 1E instrumentation identified in the February 2013 OIP Submittal (see below for list) Ameren Missouri has determined not to repower the non-Class 1E racks with a temporary battery. Instead, instrument readings will be obtained using portable instruments. As stated in our original submittal, Ameren Missouri will develop procedures to read this instrumentation locally, where applicable, using a portable instrument, as required by Section 5.3.3 of NEI 12-06. The key parameters powered from a non-Class 1E source requiring use of portable instruments are:

- CST Level
- RCS Passive Injection Level (Safety Injection Accumulator)
- SFP Temperature

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

Ameren Missouri evaluated the options of seismically qualifying the Condensate Storage Tank (CST) or installing a 670,000 gallon seismically qualified and missile protected CST. The evaluation determined that the installation of a new seismically qualified and missile protected CST was the best option. As a result, Ameren Missouri requested a relaxation of the implementation date for Order EA-12-049 from the fall of 2014 (completion of Refuel 20) to the spring of 2016 (Refuel 21). This request was documented in ULNRC-06036 (Reference 4) and approved by the NRC per ML13319A668 (Reference 5).

6 Open Items from Overall Integrated Plan and Interim Staff Evaluation

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

Overall Integrated Plan Open Item		Status
OI1	The RWST will need to be missile protected to credit its use in FLEX strategies.	Closed. Ameren Missouri has determined that the RWST does not require missile protection per NEI FAQ 2013-10, Shutdown Mode Capability Requirements for PWRs. See 4.2 above.
OI2	GOTHIC analysis needs to be performed to demonstrate that Containment pressure and temperature remain at acceptable levels and that instrumentation EQ requirements will be maintained.	Started. The Gothic Analysis and Instrumentation EQ Analysis are being performed. The results are currently under review.
OI3	An analysis will need to be performed to demonstrate acceptable SFP cooling pump performance with the SFP in boil-off.	Closed. The Spent Fuel Pool Cooling Pumps will not be repowered. SFP cooling will be maintained by continued makeup and boil-off using the Phase 2 portable equipment.
OI4	For non-Class 1E instrumentation that will be repowered using a temporary battery, an analysis will need to be performed to determine battery life and frequency of replacing battery	Closed. Ameren Missouri has determined that the non-Class 1E instrument racks will not be re-powered via a temporary battery. The required instrument readings will be obtained via portable instruments. See 4.5 above.
OI5	The current CST and CST pipe chase are non-seismic. Callaway may pursue the construction of a new seismically qualified and missile protected CST. Current FLEX strategies rely on the existing CST tank. Future evaluation is required to determine the impact on FLEX strategies should the new CST be constructed.	Started. Ameren Missouri will construct a new CST that is seismically qualified and missile protected. Relaxation of Order requirements regarding the date of full implementation was requested (Reference 4) and has been approved (Reference 5).

Overall Integrated Plan Open Item	Status
OI6 The method for isolating accumulators during RCS inventory control has not been finalized	Closed. The accumulators will be vented during RCS inventory control to prevent nitrogen ingestion into the RCS.
OI7 The method for repowering the SFP cooling pumps has not been finalized.	Closed. The SFP Cooling Pumps will not be repowered. SFP cooling will be maintained by continued makeup and boil-off using the Phase 2 portable equipment.
OI8 The Westinghouse RCP SHIELD® Seal issue has not been resolved.	Started. See Status of Open Items 3.2.1.2.B and 3.2.1.2.D in Section 7 below for additional information on this issue.

Interim Staff Evaluation Open Item	Status
3.2.1.2.B RCP Seal O-Ring Integrity and Leakage Rate Additional review of the licensee's applicable analysis and relevant Reactor Coolant Pump (RCP) seal leakage testing data is needed to justify that (1) the integrity of the associated 0-rings will be maintained at the temperature conditions experienced during the ELAP event, and (2) the seal leakage rate used in the ELAP is adequate and acceptable.	Started As stated in the ISE, The PWROG is working on these issues and will submit the NRC position papers to the NRC that will contain test data regarding the maximum seal leakage rates of Westinghouse traditional and SHIELD seals, and Flowserve seals at higher cold-leg temperatures. The NRC will review the position papers upon their receipt.

3.2.1.2.D RCP Seal Leakage Rate The acceptability of the use of the selected seals and the RCP seal leakages rates in the ELAP analysis must be justified.	Started The PWROG is working on these issues and will submit the NRC position papers to the NRC that will contain test data regarding the maximum seal leakage rates of Westinghouse traditional and SHIELD seals, and Flowserve seals at higher cold-leg temperatures. The NRC will review the position papers upon their receipt.
3.2.1.3.A Specify Key Parameters During the NRC audit process the licensee was requested to provide the following information: If the ANS 5.1-1979 + 2 sigma model is used in the ELAP analysis, specify the values of the following key parameters used to determine the decay heat: (1) initial power level, (2) fuel enrichment, (3) fuel burnup, (4) effective full power operating days per fuel cycle, (5) number of fuel cycles, if hybrid fuels are used in the core, and (6) fuel characteristics based on the beginning of the cycle, middle of the cycle, or end of the cycle. Address the adequacy of the values used. If the different decay heat model is used, describe the specific model and address the acceptability of the model and the analytical results.	Started. Ameren Missouri will provide the requested information.
3.2.1.8.B Boric Acid Mixing The Pressurized-Water Reactor Owners Group submitted to the NRC a position paper, dated August 15, 2013, which provides test data regarding boric acid mixing under single-phase natural circulation conditions and outlined applicability conditions intended to ensure that boric acid addition and mixing would occur under conditions similar to those for which boric acid mixing data is available. During the audit process, the licensee informed the NRC staff of its intent to abide by the generic approach discussed above; however, the NRC staff concluded that the August 15, 2013, position paper was not adequately justified and that further information is required.	Started The NRC has subsequently endorsed the position paper with some clarifications (Reference 9) Ameren Missouri will evaluate the clarifications and update the OIP, as needed.
3.2.4.9.A Fuel Oil Quality Information is needed regarding plans for assuring and maintaining fuel oil quality.	Started. Ameren Missouri will provide the requested information.

3.4.A Offsite Resource Capabilities Details are needed to demonstrate the minimum capabilities for offsite resources will be met per NEI 12-06 Section 12.2.	Started. Ameren Missouri will provide the requested information.

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 OIP described in this enclosure.

1. ULNRC-05962, "Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated February 28, 2013
2. NRC Order Number EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012
3. ULNRC-06024, "First Six-Month Status Report In Response To March 12, 2012 Commission Order Modifying Licenses With Regard To Requirements For Mitigation Strategies For Beyond-Design-Basis External Events (Order Number EA-12-049)," dated August 29, 2013
4. 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
5. 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
6. ML133224A195, Callaway Plant, Unit 1 - Interim Staff Evaluation Relating To Overall Integrated Plan In Response To Order EA-12-049 (Mitigation Strategies) (TAC No. MF0772), dated December 19, 2013
7. ML13273A514, NEI Shutdown/Refueling Modes White Paper, Rev 0 9/18/13
8. ML13267A382, NRC Letter from Mr. Jack Davis, NRC, to Mr. Joseph E. Pollock, NRC Endorsement of FLEX Generic Open Item for Shutdown Refueling Modes, dated September 30, 2013
9. ML13276A183, NRC Letter from Mr. Jack Davis, NRC, to Mr. Jack Stringfellow, PWROG, NRC Endorsement of PWROG Boron Mixing White Paper, dated January 8, 2014
10. ML13241A186, NEI Letter from Mr. Nicholas Pappas to NRC, Mr. Jack R. Davis, EA-12-049 Mitigating Strategies Resolution of Extended Battery Duty Cycles Generic Concern, dated August 27, 2013

11. ML13241A188, NRC Letter from Mr. Jack Davis, NRC, to Mr. Joseph E. Pollock, Battery Life White Paper Endorsement, dated September 16, 2013