Omaha Public Power District

444 South 16th Street Mall
Omaha, NE 68102-2247

LIC-14-0108
August 27, 2014

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

Fort Calhoun Station, Unit No. 1
Renewed Facility Operating License No. DPR-40
NRC Docket No. 50-285

Subject: Omaha Public Power District's Third 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

References: See Page 3

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued an Order (Reference 1) to all power reactor licensees and holders of construction permits in active or deferred status. The Order was effective immediately and requires the Omaha Public Power District (OPPD) 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 (BDBEE). Specific requirements are described in Attachment 2 of the Order.

Pursuant to Section IV, Condition C.2 of the Order, licensees are to provide a status report at six-month intervals following submittal of the Overall Integrated Plan (OIP), which OPPD submitted on February 28, 2013 (Reference 4). This letter provides the third six-month status report. Updates to the Milestone Schedule made in previous status reports (References 5 and 6) have been incorporated. The enclosed Milestone Schedule supersedes the schedules provided with References 5 and 6.

The OIP (Reference 4) and subsequent six-month status reports were prepared utilizing NEI guidance (Reference 2) as endorsed with exceptions and clarifications by the NRC in Reference 3.

There are no regulatory commitments contained in this submittal.

If you should have any questions regarding this submittal, please contact Mr. Bill R. Hansher at (402) 533-6894.

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 27, 2014.

Respectfully,

Edwin D. Dean III
Plant Manager

EDD/GEG/mle

Enclosure: Third Six-Month Status Report for the Implementation of Order EA-12-049

References

1. NRC Order Number EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012 (ML12054A736) (NRC-12-0020)
2. Nuclear Energy Institute (NEI) 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, dated August 2012 (ML12242A378)
3. 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, dated August 29, 2012 (ML12229A174)
4. Letter from OPPD (L. P. Cortopassi) to NRC (Document Control Desk), "Omaha Public Power District's 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 (Order Number EA-12-049)," dated February 28, 2013 (ML13064A298) (LIC-13-0019)
5. Letter from OPPD (L. P. Cortopassi) to NRC (Document Control Desk), "Omaha Public Power District's First 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," dated August 28, 2013 (ML 13268A075) (LIC-13-0123)
6. Letter from OPPD (L. P. Cortopassi) to NRC (Document Control Desk), "Omaha Public Power District'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," dated February 24, 2014 (ML14055A412) (LIC-14-0021)

Fort Calhoun Station, Unit No. 1

Third 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

The Omaha Public Power District (OPPD) developed an Overall Integrated Plan (Reference 1), documenting the diverse and flexible strategies (FLEX), in response to Reference 2. This enclosure provides an update of milestone accomplishments since submittal of the Overall Integrated Plan, including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

2 Milestone Accomplishments

- Control Room Heatup Calculation has been completed.
- FLEX Support Guideline Basis Documents and Executive Volume have been issued.

Although not specifically identified as a Milestone, the Draft Lower Mode FLEX Support Guidelines were issued as well.

3 Milestone Schedule Status

Attachment 1 contains an update to the Milestone Schedule (Reference 1, Enclosure, Attachment 2) provided with the Overall Integrated Plan. The status of each milestone is shown, as are revised completion dates. The dates are planning dates subject to change as design and implementation details are developed. Attachment 1 is formatted to align with the table provided in the Nuclear Energy Institute's (NEI) Six-Month Status Report Template and supersedes the Milestone Schedule provided by Reference 1.

Evaluation of FLEX modifications is largely complete. However, the completion date was revised to accommodate development of a conceptual design for remote monitoring of critical safety parameters that will address beyond design basis flooding. Based on industry operating experience on the timing of FLEX storage building design and construction time windows, the target completion date for procurement of on-site FLEX equipment was extended to allow prioritization of resources for the development of FLEX modifications. The revised milestone target completion dates do not impact the implementation date of the Order.

4 Changes to Compliance Method

There are no changes to the compliance method as documented in the Fort Calhoun Station Overall Integrated Plan (Reference 1). The results of the Control Room heatup calculation (see Overall Integrated Plan Open Item #2 in Section 6, below) show that control room cooling will not be required for a significantly longer period of time than was assumed in the Overall Integrated Plan timeline. OPPD is evaluating the method that will be used to establish cooling to the control room and will provide an update to the strategy in a future 6-month update.

As discussed in previous 6-month updates, OPPD has developed an interim strategy to address beyond-design-basis (BDB) flooding. This strategy is similar to that described in Reference 1,

Enclosure, Appendix B, Action 24, but involves a slightly different portable equipment configuration to accommodate issues not yet addressed by FLEX modifications. OPPD is currently revising the interim BDB flooding strategy to address the potential higher flooding levels. Some or all of the interim equipment and strategies may be incorporated into the FLEX Overall Integrated Plan. OPPD will provide the status of potential integration of the interim flood strategy into the Overall Integrated Plan in a future six-month update.

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

OPPD expects to comply with the Order's implementation date and no relief/relaxation is required at this time.

6 Open Items from Overall Integrated Plan and Draft Safety Evaluation

The following tables provide a summary of the open items documented in the Overall Integrated Plan (Reference 1) or the Draft Safety Evaluation (SE) and the status of each item.

Overall Integrated Plan Open Item	Status
1. Communicate exceptions related to Site Security Plan or Other License requirements	Not Started
2. Complete Control Room Heatup Calculation	Complete
3. Complete Reactor Coolant System (RCS) Makeup Evaluation with Reactor Coolant Pump (RCP) Controlled Bleed-off (CBO) Modification	Not Started
4. Develop Playbook	Started
5. Complete Water Chemistry Impact Analysis and review impact on the strategies	Complete
6. Complete Core Uncovery Time Evaluation with RCP CBO Isolation. (This is subtask of open item #3.)	Not Started
7. Evaluate Auxiliary Building Ventilation Requirements with Spent Fuel Pool (SFP) Evaporation	Started
8. Evaluate Environmental Conditions after Extended Loss of AC Power (ELAP) in critical FLEX deployment areas	Not Started

Draft Safety Evaluation Open / Confirmatory Items	Status
Interim Staff Evaluation (ISE) dated February 27, 2014 (Reference 3).	Attachment 2 of this enclosure describes the status of the Open Items and Confirmatory Items from the ISE.

7 Potential Draft Safety Evaluation Impacts

There are no potential impacts to the Draft Safety Evaluation identified at this time.

8 References

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

1. Letter from OPPD (L. P. Cortopassi) to NRC (Document Control Desk), "Omaha Public Power District's 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 (Order Number EA-12-049)," dated February 28, 2013 (ML13064A298), (LIC-13-0019)

2. NRC Order Number EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012 (ML12054A736), (NRC-12-0020)

3. Letter from NRC (J. S. Bowen) to OPPD (L. P. Cortopassi), "Fort Calhoun Station, Unit 1 - Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies) (TAC NO. MF0969)" (ML14007A693) (NRC-14-0014)

Attachments: 1. FLEX Overall Integrated Implementation Plan Milestone Schedule, Revision 3
2. Status of Interim Staff Evaluation Open Items and Confirmatory Items

Fort Calhoun Station EA-12-049 (FLEX) Overall Integrated Implementation Plan

Milestone Schedule
Revision 3

The following milestone schedule is provided. The dates are planning dates subject to change as design and implementation details are developed. Any changes to the following target dates will be reflected in subsequent 6-month status reports.

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	
Update 7	Aug. 2016	Not Started	
FLEX Strategy Evaluation	Nov. 2014	Started	
Walk-throughs or Demonstrations	Nov. 2016	Not Started	
Perform Staffing Analysis	Sep. 2015	Not Started	
Modifications:			
Modifications Evaluation	Jun. 2014	Started	Sep. 2014
Design Engineering	Aug 2015	Started	
Implementation Outage	Oct. 2016	Not Started	
Storage:			
Storage Design Engineering	Oct. 2015	Started	
Storage Implementation	Apr. 2016	Not Started	
FLEX Equipment:			
Procure On-Site Equipment	Aug. 2014	Started	Mar. 2016
Develop Strategies with RRC	Mar. 2015	Started	
Install Off-Site Delivery Station (if Necessary)	Not planned at this time	Not planned at this time	
Procedures:			
PWROG issues NSSS-specific guidelines	Jun. 2014	Complete	
Create Site-Specific FSGs	May 2015	Not Started	
Create Maintenance Procedures	Feb. 2015	Not Started	
Training:			
Develop Training Plan	Nov. 2014	Not Started	
Training Complete	Sep. 2016	Not Started	
Full Site FLEX Implementation	Oct. 2016	Started	
Submit Completion Report	Dec. 2016	Not Started	

Status of Interim Staff Evaluation Open Items and Confirmatory Items

OPEN ITEMS

Item #	NRC Ref. #	Description	Status August 2014 Update
1	3.2.1.6.B	Sequence of Events- Confirm whether the CENTS code ELAP reanalysis reflecting the CBO isolation modification affected the SOE timeline, and if so, that the SOE timeline has been updated and the overall FLEX mitigation strategies reflect these results.	NOT STARTED Expect completion to be documented in February 2015 Update.

CONFIRMATORY ITEMS

Item #	NRC Ref. #	Description	Status August 2014 Update
1	3.1.1.1.A	Protection of FLEX equipment (seismic hazard)- Confirm that all FLEX equipment stored in the auxiliary building and the new FLEX Support Building (FSB) are seismically restrained to ensure equipment is not damaged during a seismic event and that the FLEX equipment is not damaged by non-seismically robust equipment due to seismic interactions.	IN PROGRESS Expect completion of design documentation by February 2016 Update. Expect completion of building and placement of FLEX equipment by August 2016 Update.
2	3.1.1.2.A	Deployment of FLEX equipment (seismic hazard) - Confirm that deployment pathways for the FLEX portable equipment are not susceptible to soil liquefaction.	IN PROGRESS Expect completion of design documentation by February 2016 Update. Expect completion of building and placement of FLEX equipment by August 2016 Update.

Status of Interim Staff Evaluation Open Item or Confirmatory Items

Item #	NRC Ref. #	Description	Status August 2014 Update
3	3.1.1.3.A	Procedural Interfaces (seismic) - Confirm the licensee develops (1) methods and locations for alternate monitoring of key parameters; (2) guidance on critical actions to perform until alternate indications can be obtained; and (3) guidance on control of critical equipment without control power.	IN PROGRESS Expect completion to be documented in August 2015 Update.
4	3.1.1.4.A	Off-site Resources - Confirm the location of the off-site staging area(s) and acceptability of the access routes considering the seismic, flooding, high wind, snow, ice, and extreme cold hazard.	NOT STARTED Expect completion of Regional Response Center "Playbook" by February 2016 Update.
5	3.1.2.2.A	Deployment (flood) - Confirm the method of accessing the ultimate heat sink (UHS), the Missouri River, using FLEX equipment during high river levels or after flood waters inundate the site up to the current design basis flood elevation of 1,014 foot elevation is addressed. The plan does not identify the deployed location of the fire truck or river drafting pump nor how they are accessed and monitored by plant operators, considering the site's flooded condition.	IN PROGRESS A conceptual design has been developed to install a FLEX well that will provide a means to provide makeup water to the Steam Generators, RCS and Spent Fuel Pool via a submersible pump. Alternately, submersible pumps procured for the interim Beyond Design Basis flooding may be used to access flood waters if the FLEX well is not considered a viable option. Expect completion of design documentation by August 2015 Update. Expect completion of well and/or and final placement of FLEX equipment for flooding response by August 2016 Update.
6	3.1.3.1.A	Protection of FLEX Equipment (high wind hazard)- Confirm the design code used for the FSB for the high wind hazard and the method of protection of the N+1 FLEX equipment from tornado borne missiles is acceptable.	IN PROGRESS Expect completion of design documentation by February 2016 Update. Expect completion of building by August 2016 Update.

Status of Interim Staff Evaluation Open Item or Confirmatory Items

Item #	NRC Ref. #	Description	Status August 2014 Update
7	3.2.1.1.A	CENTS - Confirm that the use of CENTS in the ELAP analysis for FCS is limited to the flow conditions before reflux boiling initiates. This includes providing a justification for how the initiation of reflux boiling is defined. Confirm that the reanalysis for the case with the CBO isolated conforms to the above limitations.	NOT STARTED Documentation of application of CENTS limitations regarding reflux boiling will be specifically addressed in the nuclear steam supply system (NSSS) timing analysis that will be performed to address Open Item #1.
8	3.2.1.2.B	RCP Seal Leakage Rates - Confirm the selection and justification for the seal leakage rates assumed in the ELAP analysis from the initiation of the ELAP event to the time frame when subcooling in the RCS cold legs decreases to less than 50°F. Confirm the calculated maximum temperature and pressure, and minimum subcooling in the RCS cold legs during the ELAP before isolation of the CBO. Confirm the seal leakage rates per RCP before and after isolation of the CBO used in the ELAP reanalysis for determination of the SOE and associated time limes.	NOT STARTED Documentation of the effects of isolation of CBO on RCS leak rates will be specifically addressed in the NSSS timing analysis that will be performed to address Open Item #1.
9	3.2.1.3.A	Decay Heat - Confirm the key physics parameters used for each of the decay heat evaluation scenarios to ensure that the FCS ELAP response is conservative relative to the ANS standard.	NOT STARTED Documentation of the validity of the design inputs will be provided in the NSSS timing analysis that will be performed to address Open Item #1.
10	3.2.1.4.A	Initial Values for Key Plant Parameters and Assumptions- Confirm which inputs and assumptions are appropriate relative to being plant specific or derived from WCAP-17601-P.	NOT STARTED Documentation of the validity of the design inputs and assumptions will be provided in the NSSS timing analysis that will be performed to address Open Item #1.

Status of Interim Staff Evaluation Open Item or Confirmatory Items

Item #	NRC Ref. #	Description	Status August 2014 Update
11	3.2.1.5.A	Monitoring Instrumentation and Controls - Confirm suitability of emergency feedwater storage tank (EFWST) level monitoring instrumentation considering the environmental conditions in the auxiliary building following an ELAP event.	IN PROGRESS The ability to monitor EFWST level locally will be addressed as part of the alternate monitoring locations conceptual design discussed in Item #3.
12	3.2.1.5.B	Monitoring Instrumentation and Controls - Confirm suitability of existing or replacement safety injection tank (SIT) level instrumentation considering the environmental conditions in the containment following an ELAP event.	NOT STARTED Environmental conditions inside containment following an ELAP event will be established as part of the NSSS analysis that will be conducted to address Open Item #1. It is expected that the current instrumentation will be qualified to continue to operate in the predicted environment. In the event that the instruments cannot be qualified, a modification will be initiated to replace one or more with qualified instruments.
13	3.2.1.8.A	Core Sub-Criticality - Confirm that the reanalysis discussed in Confirmatory Item 3.2.1.1.A continues to align with the generic resolution for boron mixing under natural circulation conditions potentially involving two-phase flow, in accordance with the Pressurized-Water Reactor Owners Group position paper, dated August 15, 2013 (ADAMS Accession No. ML 13235A135 (nonpublic for proprietary reasons)), and subject to the conditions provided in the NRC endorsement letter dated January 8, 2014 (ADAMS Accession No. ML 13276A 183) following SOE and FLEX mitigation strategy impacting changes.	NOT STARTED Documentation of the validity of the boron-mixing model during natural circulation conditions will be provided in the NSSS timing analysis that will be performed to address Open Item #1.

Status of Interim Staff Evaluation Open Item or Confirmatory Items

Item #	NRC Ref. #	Description	Status August 2014 Update
14	3.2.4.1.A	Equipment Cooling (Water) - Confirm installed charging pumps can operate during an ELAP considering the loss of support equipment.	NOT STARTED Expect completion to be documented in February 2015 Update.
15	3.2.4.2.A	Equipment Cooling (Ventilation) - Confirm that the licensee addresses environmental conditions in the vicinity of and access to all deployed FLEX equipment in the auxiliary building, to ensure continuous equipment operation and acceptable human performance.	NOT STARTED Expect completion to be documented in August 2015 Update.
16	3.2.4.2.B	Equipment Cooling (Ventilation) - Confirm that the licensee addresses environmental conditions in the main control room (CR) and the need for ventilation prior to re-establishing power to the CR ventilation fans using the FLEX DG at approximately 9 hours after the ELAP as indicated on the SOE timeline.	IN PROGRESS Expect completion to be documented in February 2015 Update.
17	3.2.4.2.C	Equipment Cooling (Ventilation) - Confirm the acceptability of the battery room temperatures (extreme hot or extreme cold) on battery performance.	NOT STARTED Expect completion to be documented in August 2015 Update.
18	3.2.4.2.D	Equipment Cooling (Ventilation) - Confirm the acceptability of the hydrogen buildup in the battery room during charging.	NOT STARTED Expect completion to be documented in August 2015 Update.
19	3.2.4.4.A	Lighting- Confirm the lighting provisions for all areas within the auxiliary building where FLEX equipment is deployed as well as the outdoor areas where FLEX equipment is deployed.	NOT STARTED Expect completion to be documented in August 2015 Update.

Status of Interim Staff Evaluation Open Item or Confirmatory Items

Item #	NRC Ref. #	Description	Status August 2014 Update
20	3.2.4.4.B	Communications- Confirm that upgrades to the site's communications systems have been completed.	IN PROGRESS Expect completion to be documented in August 2015 Update.
21	3.2.4.5.A	Protected and Internal Locked Area Access - Confirm how the provisions for access to protected areas and internally locked areas are incorporated into the FLEX mitigation strategies.	NOT STARTED Expect completion to be documented in August 2015 Update.
22	3.2.4.7.A	Water Sources- Confirm that the licensee addresses the impacts of water chemistry from the various onsite sources for potential use in FLEX strategy installed and portable equipment.	COMPLETE A water chemistry evaluation (SL-011688, "Evaluation of Alternate Cooling Water Sources for Use in Mitigating a Beyond Design Basis External Event") was conducted to determine the viability of existing water sources to support FLEX makeup needs regarding maintenance of heat transfer and corrosion resistance. FLEX strategies use insights from this report to prioritize water sources and determine when and how to utilize Regional Response Center equipment.
23	3.2.4.8.A	Electrical Power Sources- Confirm the technical basis for the selection and size of the FLEX generators to be used in support of the coping strategies and the planned approach for fault protection and electrical separation between existing power sources and the FLEX power sources.	IN PROGRESS Expect completion to be documented in February 2015 Update.

Status of Interim Staff Evaluation Open Item or Confirmatory Items

Item #	NRC Ref. #	Description	Status August 2014 Update
24	3.2.4.9.A	Portable Equipment Fuel - Confirm the total fuel consumption needs when FLEX equipment designs are finalized.	IN PROGRESS Expect completion to be documented in February 2015 Update.
25	3.2.4.10.A	Load Reduction to Conserve DC Power- Confirm if the non-1E battery modification becomes a plan revision to extend the battery life of the existing Class 1 E batteries and that any changes to the FLEX mitigation strategies have been incorporated.	ON HOLD OPPD has evaluated the ELAP capabilities of current class 1E DC batteries, along with other applications requiring portable generators to support FLEX strategies and has concluded that restoration of power to a battery charger prior to depletion of the current batteries provides more benefits than adding a non-1E battery to increase the depletion time on the 1E batteries. OPPD has placed this modification on hold pending the completion of the design for EC 60820, "2016 RFO Electrical Connections – FLEX." Once the successful design of the FLEX electrical distribution strategy is assured, OPPD will cancel the non-1E battery modification.

Status of Interim Staff Evaluation Open Item or Confirmatory Items

Item #	NRC Ref. #	Description	Status August 2014 Update
26	3.3.1.A	Use of Portable Pumps- Confirm that the number of FLEX pumping equipment for accessing the UHS during the Phase 2 coping strategies meets the spare (N+1) capability. One fire truck and two river drafting pumps are provided to access the UHS. Confirm whether the river drafting pumps alone can achieve the mitigation strategy objectives (without the use of the fire truck) during both the flooded and non-flooded site conditions. Alternately, confirm implementation of a qualified well as a diverse alternate source of a long term water supply.	IN PROGRESS OPPD currently plans to install a qualified well as a diverse means of supplying UHS water. The use of the river drafting pumps and/or the fire truck would then become the second "qualified" strategy for accessing the UHS. This approach is consistent with NEI 12-06, Section 3.2.2, which states, "it is also acceptable to have multiple strategies to accomplish a function." EC 64447 is being developed to design the FLEX well. If, during the design process, it is determined that a qualified well cannot be constructed, OPPD will re-evaluate the capabilities of the existing draft pump/fire truck strategy to ensure that the N+1 requirement is met. Expect completion of design documentation by August 2015 Update. Expect completion of well and/or and final placement of FLEX equipment for flooding response by August 2016 Update.
27	3.4.A	Off-Site Resources- Confirm how conformance with NEI 12-06, Section 12.2 guidelines 2 through 10 will be met.	IN PROGRESS Expect completion of Regional Response Center "Playbook" by February 2016 Update.