



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 5, 2016

Mr. Shane M. Marik
Site Vice President and Chief
Nuclear Officer
Omaha Public Power District
Fort Calhoun Station
9610 Power Lane, Mail Stop FC-2-4
Blair, NE 68008

SUBJECT: FORT CALHOUN STATION, UNIT 1 - REPORT FOR THE AUDIT REGARDING IMPLEMENTATION OF MITIGATING STRATEGIES AND RELIABLE SPENT FUEL POOL INSTRUMENTATION RELATED TO ORDERS EA-12-049 AND EA-12-051 (CAC NOS. MF0969 AND MF0968)

Dear Mr. Marik:

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design-Basis External Events" and Order EA-12-051, "Order to Modify Licenses With Regard To Reliable Spent Fuel Pool Instrumentation," (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML12054A736 and ML12054A679, respectively). The orders require holders of operating reactor licenses and construction permits issued under Title 10 of the *Code of Federal Regulations* Part 50 to submit for review, Overall Integrated Plans (OIPs) including descriptions of how compliance with the requirements of Attachment 2 of each order will be achieved.

By letter dated February 28, 2013 (ADAMS Accession No. ML13064A298), Omaha Public Power District (the licensee), submitted its OIP for Fort Calhoun Station, Unit 1 (FCS) in response to Order EA-12-049. By letters dated August 28, 2013, February 24, 2014, August 27, 2014, February 27, 2015, August 27, 2015, and February 29, 2016 (ADAMS Accession Nos. ML13268A075, ML14055A412, ML14239A679, ML15058A679, ML15239B219 and ML16060A500, respectively), the licensee submitted its first six six-month updates to the OIP. By letter dated August 28, 2013 (ADAMS Accession No. ML13234A503), the NRC notified all licensees and construction permit holders that the staff is conducting audits of their responses to Order EA-12-049 in accordance with NRC Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-111, "Regulatory Audits" (ADAMS Accession No. ML082900195). This audit process led to the issuance of the FCS interim staff evaluation (ISE) dated February 27, 2014 (ADAMS Accession No. ML14007A693), and continues with in-office and onsite portions of this audit.

By letter dated February 28, 2013 (ADAMS Accession No. ML13059A268), the licensee submitted its OIP for FCS, in response to Order EA-12-051. By email dated August 23, 2013 (ADAMS Accession No. ML13235A168), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated August 28, 2013, October 18, 2013, February 24, 2014, August 25, 2014, February 27, 2015, August 19, 2015, September 28, 2015, and February 26, 2016 (ADAMS Accession Nos. ML13241A411, ML13294A338, ML14055A397, ML14237A574, ML15058A738, ML15231A597, ML15272A415, and ML16057A060, respectively), the licensee submitted its RAI responses and first six six-month updates to the OIP. The NRC staff's review to date led to the issuance of the FCS ISE and RAI dated November 25, 2013 (ADAMS Accession No. ML13317A583). By letter dated March 26, 2014 (ADAMS Accession No. ML14083A620), the NRC notified all licensees and construction permit holders that the staff is conducting in-office and onsite audits of their responses to Order EA-12-051 in accordance with NRC NRR Office Instruction LIC-111, as discussed above.

The ongoing audits allow the staff to review open and confirmatory items from the mitigation strategies ISE, RAI responses from the spent fuel pool instrumentation (SFPI) ISE, the licensee's integrated plans, and other audit questions. Additionally, the staff gains a better understanding of submitted and updated information, audit information provided on e-portals, and preliminary Overall Program Documents/Final Integrated Plans while identifying additional information necessary for the licensee to supplement its plan and staff potential concerns.

In support of the ongoing audit of the licensee's OIPs, as supplemented, the NRC staff conducted an onsite audit at FCS from May 9 - 12, 2016, per the audit plan dated March 8, 2016 (ADAMS Accession No. ML16064A077). The purpose of the onsite portion of the audit was to provide the NRC staff the opportunity to continue the audit review and gain key insights most easily obtained at the plant as to whether the licensee is on the correct path for compliance with the Mitigation Strategies and SFPI orders. The onsite activities included detailed analysis and calculation discussion, walk-throughs of strategies and equipment laydown, visualization of portable equipment storage and deployment, staging and deployment of offsite equipment, and physical sizing and placement of SFPI equipment.

The enclosed audit report provides a summary of the activities for the onsite audit portion. Additionally, this report contains an attachment listing all open audit items currently under NRC staff review.

S. Marik

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If you have any questions, please contact me at 301-415-2833 or by e-mail at Peter.Bamford@nrc.gov.

Sincerely,

A handwritten signature in black ink that reads "Peter Bamford". The signature is written in a cursive style with a large, looping initial "P".

Peter Bamford, Senior Project Manager
Orders Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-285

Enclosure:
Audit report

cc w/encl: Distribution via Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

AUDIT REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO ORDERS EA-12-049 AND EA-12-051 MODIFYING LICENSES
WITH REGARD TO REQUIREMENTS FOR
MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS
AND RELIABLE SPENT FUEL POOL INSTRUMENTATION
OMAHA PUBLIC POWER DISTRICT
FORT CALHOUN STATION. UNIT 1
DOCKET NO. 50-285

BACKGROUND AND AUDIT BASIS

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design-Basis External Events" and Order EA-12-051, "Order to Modify Licenses With Regard To Reliable Spent Fuel Pool Instrumentation," (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML12054A736 and ML12054A679, respectively). Order EA-12-049 directs licensees to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling capabilities in the event of a beyond-design-basis external event (BDBEE). Order EA-12-051 requires, in part, that all operating reactor sites have a reliable means of remotely monitoring wide-range SFP levels to support effective prioritization of event mitigation and recovery actions in the event of a BDBEE. The orders require holders of operating reactor licenses and construction permits issued under Title 10 of the *Code of Federal Regulations* Part 50 to submit for review, Overall Integrated Plans (OIPs) including descriptions of how compliance with the requirements of Attachment 2 of each order will be achieved.

By letter dated February 28, 2013 (ADAMS Accession No. ML13064A298), Omaha Public Power District (OPPD, the licensee), submitted its OIP for Fort Calhoun Station, Unit 1 (FCS) in response to Order EA-12-049. By letters dated August 28, 2013, February 24, 2014, August 27, 2014, February 27, 2015, August 27, 2015, and February 29, 2016 (ADAMS Accession Nos. ML13268A075, ML14055A412, ML14239A679, ML15058A679, ML15239B219 and ML16060A500, respectively), the licensee submitted its first six six-month updates to the OIP. By letter dated August 28, 2013 (ADAMS Accession No. ML13234A503), the NRC notified all licensees and construction permit holders that the staff is conducting audits of their responses to Order EA-12-049 in accordance with NRC Office of Nuclear Reactor Regulation (NRR) Office

Enclosure

Instruction LIC-111, "Regulatory Audits" (ADAMS Accession No. ML082900195). This audit process led to the issuance of the FCS interim staff evaluation (ISE) dated February 27, 2014 (ADAMS Accession No. ML14007A693), and continues with in-office and onsite portions of this audit.

By letter dated February 28, 2013 (ADAMS Accession No. ML13059A268), the licensee submitted its OIP for FCS, in response to Order EA-12-051. By email dated August 23, 2013 (ADAMS Accession No. ML13235A168), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated August 28, 2013, October 18, 2013, February 24, 2014, August 25, 2014, February 27, 2015, August 19, 2015, September 28, 2015, and February 26, 2016 (ADAMS Accession Nos. ML13241A411, ML13294A338, ML14055A397, ML14237A574, ML15058A738, ML15231A597, ML15272A415, and ML16057A060, respectively), the licensee submitted its RAI responses and first six six-month updates to the OIP. The NRC staff's review to date led to the issuance of the FCS ISE and RAI dated November 25, 2013 (ADAMS Accession No. ML13317A583). By letter dated March 26, 2014 (ADAMS Accession No. ML14083A620), the NRC notified all licensees and construction permit holders that the staff is conducting in-office and onsite audits of their responses to Order EA-12-051 in accordance with NRC NRR Office Instruction LIC-111, as discussed above.

The ongoing audits allow the staff to review open and confirmatory items from the mitigation strategies ISE, RAI responses from the spent fuel pool instrumentation (SFPI) ISE, the licensee's integrated plans, and other audit questions. Additionally, the staff gains a better understanding of submitted and updated information, audit information provided on e-portals, and preliminary Overall Program Documents (OPDs) /Final Integrated Plans (FIPs) while identifying additional information necessary for the licensee to supplement its plan and staff potential concerns.

In support of the ongoing audit of the licensee's OIPs, as supplemented, the NRC staff conducted an onsite audit at FCS from May 9 - 12, 2016, per the audit plan dated March 8, 2016 (ADAMS Accession No. ML16064A077). The purpose of the onsite portion of the audit was to provide the NRC staff the opportunity to continue the audit review and gain key insights most easily obtained at the plant as to whether the licensee is on the correct path for compliance with the Mitigation Strategies and SFPI orders. The onsite activities included detailed analysis and calculation discussion, walk-throughs of strategies and equipment laydown, visualization of portable equipment storage and deployment, staging and deployment of offsite equipment, and physical sizing and placement of SFPI equipment.

Following the licensee's declarations of order compliance, the NRC staff will evaluate the OIPs, as supplemented, the resulting site-specific OPDs/FIPs, and, as appropriate, other licensee submittals based on the requirements in the orders. For Order EA-12-049, the staff will make a safety determination regarding order compliance using the Nuclear Energy Institute (NEI) guidance document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide" Revision 0, issued in August 2012 (ADAMS Accession No. ML12242A378), or Revision 2, issued in December 2015 (ADAMS Accession No. ML16005A625). These guidance documents are endorsed by NRC Japan Lessons-Learned Directorate (JLD) interim staff guidance (ISG) 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 (ADAMS Accession No. ML12229A174), and Revision 1 (ADAMS

Accession No. ML15357A163), with certain clarifications, as providing an acceptable means of meeting the order requirements. For Order EA-12-051, the staff will make a safety determination regarding order compliance using the NEI guidance document NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation'" (ADAMS Accession No. ML12240A307), as endorsed, with exceptions and clarifications, by NRC ISG JLD-ISG-2012-03 "Compliance with Order EA-12-051, 'Reliable Spent Fuel Pool Instrumentation'" (ADAMS Accession No. ML12221A339), as providing one acceptable means of meeting the order requirements. Should the licensee propose an alternative strategy or other method deviating from the guidance, additional staff review will be required to evaluate if the alternative strategy complies with the applicable order.

AUDIT ACTIVITIES

The onsite audit was conducted at the FCS facility from May 9 - 12, 2016. The NRC audit team staff was as follows:

Title	Team Member
Team Lead/Project Manager	Peter Bamford
Project Manager	Milton Valentin
Technical Support	Bruce Heida
Technical Support	Joshua Miller
Technical Support	Khoi Nguyen
Technical Support	Matthew McConnell
Technical Support	Kevin Roche

The NRC staff executed the onsite portion of the audit per the three part approach discussed in the March 8, 2016, plan, to include conducting a tabletop discussion of the site's integrated mitigating strategies compliance program, a review of specific technical review items, and discussion of specific program topics. Activities that were planned to support the above included detailed analysis and calculation discussions; walk-throughs of strategies and equipment laydown; visualization of portable equipment storage and deployment; staging and deployment of offsite equipment; and physical sizing and placement of SFPI equipment.

AUDIT SUMMARY

1.0 Entrance Meeting (May 9, 2016)

At the audit entrance meeting, the NRC staff audit team introduced itself followed by introductions from the licensee's staff. The NRC audit team provided a brief overview of the audit's objectives and anticipated schedule.

2.0 Integrated Mitigating Strategies Compliance Program Overview

Per the audit plan and as an introduction to the site's program, the licensee provided a presentation to the NRC audit team. The licensee provided an update to the compliance status for each order, as well as an overview of its strategy to maintain core cooling,

containment, and SFP cooling in the event of a BDBEE. The strategy presentation included the location of the FLEX equipment storage facility (FLEX Storage Building), and a description of the FLEX equipment that would be stored there. The presentation also included an overview of the external events being considered.

3.0 Onsite Audit Technical Discussion Topics

Based on the audit plan, and with a particular emphasis on the Part 2 "Specific Technical Review Items," the NRC staff technical reviewers conducted interviews with licensee technical staff, site walk-downs, and detailed document reviews for the items listed in the plan. Results of these technical reviews that require additional information from the licensee or are still under NRC review are documented in the audit item status table in Attachment 3, as discussed in the Conclusion section below.

3.1 Reactor Systems Technical Discussions and Walk-Downs

The NRC staff met with licensee staff to discuss the amount of leakage from the reactor coolant pump (RCP) seals, reactor coolant system (RCS) makeup strategy, the availability of water sources, and the ability to remove heat from the reactor coolant system via the steam generators. The NRC staff reviewed the analysis and flow calculations along with applicable procedures. The NRC staff also walked down the licensee's strategies and reviewed plant procedures for implementing the core cooling and makeup strategies.

3.2 Electrical Technical Discussions and Walk-Downs

- a. The NRC staff reviewed the calculations and strategy regarding extending battery life based on load shedding, and walked down the battery rooms to evaluate strategies for hydrogen and temperature control. The NRC staff also walked down panels used for load shedding to evaluate feasibility and timing.
- b. The NRC staff walked down connection points and locations for the FLEX electrical generators. In order to support the licensee's Phase 2 strategy, two 480V electrical generators will be pre-staged on the Auxiliary Building roof. Each generator is sized to supply all the necessary Phase 2 loads, consistent with the "N+1" provisions of NEI 12-06. The licensee also plans to utilize larger electrical generators from the NSRC in the Phase 3 strategy. The staff reviewed the licensee's load and sizing calculations associated with the FLEX generators.

3.3 SFPI Technical Discussions and Walk-Downs

The NRC staff walked down the instrument, transmitter, electronics, and display locations for the SFP level instrumentation, along with the associated cable runs. No concerns were identified during the walkdown. The NRC staff also reviewed the associated calibration, maintenance and test procedures for the SFP level instrumentation.

3.4 Other Technical Discussion Areas and Walk-Downs

- a. The NRC staff walked down the location for the FLEX Storage Building (FSB) under construction at the site. The FSB is designed to survive all applicable site external hazards. The NRC staff walked down equipment haul routes from the FSB to the designated deployment sites, and walked down haul routes from designated staging area for equipment that will be delivered from the NSRC.
- b. The NRC staff walked down the FLEX strategies for core cooling, RCS inventory, and SFP inventory functions. This included the point of deployment for the portable and pre-staged FLEX pumps, hose routing, and connection points.
- c. The NRC staff reviewed the strategy that will be implemented by the licensee to refuel the diesel-powered FLEX equipment. The NRC staff reviewed the instructions for refueling the equipment, as well as the equipment needed to perform the refueling. Additionally, the staff reviewed the licensee's procedures for ensuring adequate fuel quality.
- d. The licensee's cooldown strategy relies on operation of the steam generator atmospheric discharge valves (ADVs). In order to accomplish this function, the licensee plans to install an augmented ADV capacity during a future refueling outage. The NRC staff reviewed the capability to operate the ADVs during an extended loss of alternating current power (ELAP).
- e. The NRC staff reviewed the licensee's plans to ensure adequate communications, lighting, personnel access, and equipment access, to successfully implement the strategies. The NRC staff interviewed plant personnel responsible for these areas, and observed lighting and communication features during plant walkdowns.

4.0 Exit Meeting (May 12, 2016)

The NRC staff audit team conducted pre-exit and exit meetings with licensee staff following the completion of the onsite review activities. The NRC staff highlighted items still under review and noted that the results of the onsite audit trip will be documented in this report. Items that require additional information from the licensee or are still under NRC review are detailed in Attachment 3 of this report.

CONCLUSION

The NRC staff completed all three parts of the March 8, 2016, onsite audit plan. Each audit item listed in Part 2 of the plan was reviewed by NRC staff members while on site. In addition to the list of NRC and licensee onsite audit staff participants in Attachment 1 and Attachment 2 provide a list of documents reviewed during the onsite audit portion.

In support of the continuing audit process, as the licensee proceeds towards orders compliance for this site, Attachment 3 provides the status of all open audit review items that the NRC staff is evaluating in anticipation of issuance of a combined SE for both the mitigation strategies (MS) and SFPI orders. This attachment includes items remaining from the onsite audit, as well as

any items that are being reviewed exclusively in the NRC offices, or have been added since the onsite audit. The five sources for the audit items referenced below are as follows:

- a. MS ISE open Items (OIs) and confirmatory items (CIs)
- b. MS audit questions (AQs)
- c. Licensee-identified OIP Open Items
- d. SFPI RAIs
- e. Additional safety evaluation (SE) needed information

While this report notes the completion of the onsite portion of the audit per the audit plan dated March 8, 2016, the ongoing audit process continues, as per letters dated August 28, 2013, and March 26, 2014, to all licensees and construction permit holders for both orders.

Additionally, while Attachment 3 provides a progress snapshot of the NRC staff's review of the licensee's OIPs, as supplemented, and as augmented in the audit process, the status and progress of the NRC staff's review may change based on licensee plan changes, resolution of generic issues, and other NRC staff concerns not previously documented. Changes in the NRC staff review will be communicated in the ongoing audit process.

Attachments:

1. NRC and Licensee Staff Onsite Audit Participants
2. Onsite Audit Documents Reviewed
3. FCS MS/SFPI SE Audit Items currently under NRC staff review and requiring licensee input

Onsite Audit Participants

NRC Staff:

Peter Bamford	NRR/JLD/JOMB
Milton Valentin	NRR/JLD/JOMB
Bruce Heida	NRR/JLD/JCBB
Joshua Miller	NRR/JLD/JERB
Matthew McConnell	NRR/JLD/JERB
Khoi Nguyen	NRR/JLD/JERB
Kevin Roche	NRR/JLD/JCBB

FCS Staff:

Del Trausch	Manager Operations Support
Kristin Jacobsen	Reliability Engineer
Charlie Smith	Unit Supervisor
Kevin Pirnie	Equipment Operator
Mike Lisowyj	Equipment Operator
Scott Murray	System Engineer
Nathan Devries	Senior Emergency Planning Representative
Erick Matzke	Senior Regulatory Assurance Engineer
Brad Blome	Manager Regulatory Assurance
Steve Pierson	Exelon
Steve Gebers	Jericho Solutions
Jan Bostelman	Bostelman Engineering
Joe Willett	Bostelman Engineering
Greg Guliani	Jensen Hughes
Steve Queen	Jensen Hughes
Dave Klimek	Jensen Hughes
Lauren Scanlon	Jensen Hughes
Brian Nolan	Jensen Hughes

Documents Reviewed

FLEX Support Guidelines (FSGs)

- FSG-04, "ELAP Electrical Bus Management," Draft Rev. 0D
- FSG-05, "Initial Assessment and FLEX Equipment Staging," Draft Rev. 0F
- FSG-07, "Loss of Vital Instrument or Control Power," Draft Rev. 0B
- FSG-08, "Alternate RCS Boration," Draft Rev. 0B
- FSG-11, "Alternate SFP Makeup and Cooling," Draft Rev. 0B
- FSG-15, "Response To Beyond Design Basis Flooding," Draft Rev. 0A

Procedures

- EOP-00, "Standard Post Trip Actions," Rev. 6.1
- FIG-MVA-01, "Power Battery Chargers with 30 KW FLEX DG," Revision Draft 0F
- FIG-MVA-02, "Align and Operate 128 KW FLEX DG," Revision Draft 0F
- FIG-MVA-03, "Power Plant Loads with 400 KW FLEX DG," Revision Draft 0D
- FIG-MVA-04, "Control Room Lighting/HVAC," Draft Rev. 0C
- FIG-SFP-02, "Venting the Fuel Handling Building," Draft Rev. 0C
- IC-CP-01-4356/4357, "Spent Fuel Pool Level Indication System Calibration," Rev. 0
- Standing Order (SO) SO-O-1, "Conduct of Operations," Rev. 108
- SO-O-21, "Shutdown Operations Protection Plan," Rev. 55 (draft change)
- SO-O-26, "Plant Keys," Rev. 40a
- SO-G-107, "Storage of Transient Equipment and Material to Prevent Seismic Interactions or Tornado Pressurization," Rev. 10

Calculations/Analyses

B1-212921-01, "Robust Missile Protection Barrier FLEX Calculations and Analysis," Rev. 1

DAR-SCC-15-001, "Fort Calhoun Containment ELAP Analysis," Rev. 0

DAR-SCC-15-002, "Fort Calhoun Station NSSS Response Evaluation for an ELAP Event Initiating from Mode 1," Rev. 0

FC08260, "Tornado Missile Protection for Auxiliary Building Elevation 1057' Roof above Room 81 Blow-off Panels," Rev. 2

FC08287, "NEI 12-02 Rev. 1, Spent Fuel Pool Exposure and Exposure Rates Using An Off-Loaded Core with 72 Hours of Decay," Rev. 0

FC08354, "Control Room Heatup Calculation for Extended Loss of AC Power (ELAP)," Rev. 0

FC08362, "Overall FLEX Hydraulic Calculation," Draft Rev. 1

FC08387, "FLEX Electrical Loading and Cable Sizing," Revision 1

FC08403, "Qualitative Evaluation of Radiation Dose on the Spent Fuel Pool Level Instrumentation Displays, Processors, and Battery," Rev. 0

FC08420, "Net Positive Suction Head Available (NPSHA) of Spent Fuel Pool Circulating Pumps (AC-SA & AC-58)," Rev. 0

FC08423, "Evaluation of the Mounting Brackets for the Spent Fuel Pool Level Probe Assembly," Rev. 0

FC08463, "Auxiliary Building Temperature Response Subsequent to Extended Loss of AC Power (ELAP)," Rev. 0

FC08472, "MOHR EFP-IL SFPI System Shock and Vibration Test Report 1-0410-5," Rev. 0

FC08551, "Ft. Calhoun Containment ELAP Analysis DAR-SCC-15-001," Revision 0

SC-212921-01, "Superstructure Design Calculation," Rev. 1

SC-212921-02, "Missile Impact Evaluation," Rev. 1

SL-011688, "Evaluation of Alternate Coolant Sources for Use in Mitigating a Beyond Design Basis External Event," Rev. 2

Drawings and Sketches

FIG 8.1-1, "Simplified One Line Diagram Plant Electrical System P&ID," Rev. 148

PED-CSS-1, "Standard Specification for Seismic Conduit Supports," Rev. 16

PED-CWP-1, "Seismic Conduit Supports," Rev. 7

PED-CWP-2, "Installation of Seismic Electrical Equipment," Rev. 8

PED-ESS-17, "Conduit Systems," Rev. 4

SK-EC-55864-E01, "Spent Fuel Pool Level Instrumentation Plans and Sections," Rev. 0

Other Documents

AREVA Document 38-9247617-000 "SAFER Response Plan for Fort Calhoun Nuclear Power Station," Rev. 1, dated September 8, 2015

CC-FC-118, "Site Implementation of Diverse and Flexible Coping Strategies (FLEX) and Spent Fuel Instrumentation Program," Rev. 6

EC 55864, "Spent Fuel Pool Instrumentation – Fukushima," Rev. 1

EC 58427, "Antenna Array for Satellite Phones," Rev. 0

EC 60812, "2015 RFO Electrical Connections – FLEX," Rev. 0

EC 60814, "Installation of the New FLEX Safety Injection Refueling Water Tank," Rev. 24

EC 60820, "2016 Online Electrical Connections – FLEX," Rev. 0

EC 65758, Tab 8, "Installation of New EDGs and New Enclosure on Auxiliary Building Missile Barrier," Rev. 0

EC 65759, "FLEX DG Electrical Supply Cable Routing," Rev. 0

HDR [Hensington, Durham, and Richardson] Inc. Report, "FLEX Building Deployment Routes – Evaluation of Liquefaction Potential," Rev. 0, dated April 2016, HDR Job Number 274001, transmitted to OPPD on May 4, 2016

Mohr Document 1-0410-2, "Mohr SFP-1 Level Probe Assembly Material Qualification Report," Rev. 2

Mohr Document 1-0410-7, "MOHR EFP-IL SFPI System Battery Life Report," Rev. 2

Mohr Document 1-0410-10, "MOHR EFP-IL SFPI System Power Interruption Report," Rev. 1

Mohr Document 1-0410-13, "EFP-IL Signal Processor Technical Manual," Rev. 2

Mohr Document 1-0410-14, "SFP-1 Level Probe Assembly Technical Manual," Rev. 3

Mohr Document 1-0410-15, "MOHR EFP-IL SFPI System Uncertainty Analysis," Rev. 0

Mohr Report FAT-EFP-IL-00055, "Procedure 2014.01 Rev 0.6 Factory Acceptance Test Liquid Level Sensing System," dated January 19, 2016

Mohr Report FAT-EFP-IL-00056, "Procedure 2014.01 Rev 0.6 Factory Acceptance Test Liquid Level Sensing System," dated January 19, 2016

Olsen Associates Project No. 015-0737, "Report of Geotechnical Exploration, OPPD FLEX Equipment Storage Building," dated June 5, 2015

Record of Telecom PED-DEN95-331, "Oil Coolers (Model Groos Labs RV 26) for the Manton-Gaulin Model P-18, Charging Pumps Tag #s CH-1A/B/C"

"Seismic Evaluation of the FLEX Storage Building, OPPD Fort Calhoun Station," dated February 17, 2016

Corrective Action Program Documents

RA 2016-0620

RA 2016-0621

FCS

**Mitigation Strategies/Spent Fuel Pool Instrumentation Safety Evaluation Audit Items:
Audit Items Currently Under NRC Staff Review and Requiring Licensee Input**

Audit Item Reference	Item Summary Description	Licensee Input Needed
CI 3.2.4.2.C	Equipment Cooling (Ventilation) - Confirm the acceptability of the battery room temperatures (extreme hot or extreme cold) on battery performance.	Provide an analysis of the battery rooms to show that the batteries will not be adversely affected as a result of loss of ventilation in extreme hot (loss of ventilation) and extreme cold (loss of heating) conditions. The analysis should address maintaining temperature below/above the design limit for an indefinite coping.
AQ.19	Portable Pump capability	Provide a procedural control mechanism for minimum Safety Injection and Refueling Water Tank (SIRWT) level to maintain consistency with the hydraulic analysis for the FLEX SIRWT pump.
SE.14	Provide a discussion/analysis on the ability of electrical equipment (i.e., valve solenoids, instruments, relays, etc.) located within containment and other areas of the plant (i.e., ADV rooms, switchgear rooms, etc.) that is relied upon during an ELAP to function in the expected environmental conditions for the duration of the ELAP event (i.e., indefinitely).	Provide a discussion/analysis on the ability of electrical equipment (i.e., valve solenoids, instruments, relays, etc.) located within containment and other areas of the plant (i.e., ADV rooms, switchgear rooms, etc.) that is relied upon during an ELAP to function in the expected environmental conditions for the duration of the ELAP event (i.e., indefinitely).
SE.17	Provide a description of where/when equipment needed to support Phase 2 and Phase 3 operations will be deployed, staged and connected to plant systems during flood levels up to and including the design-basis flood.	Provide an overall flooding strategy that includes the requested detail.

S. Marik

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If you have any questions, please contact me at 301-415-2833 or by e-mail at Peter.Bamford@nrc.gov.

Sincerely,

/RA/

Peter Bamford, Senior Project Manager
Orders Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-285
Enclosure: Audit report
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NAME	SBailey	MHalter	PBamford
DATE	06/28/2016	06/28/2016	07/05/2016

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