



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

August 20, 2015

Mr. Kevin K. Davison
Site Vice President
Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota
1717 Wakonade Drive East
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2 -
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 (TAC NOS. MF0834,
MF0835, MF0832, AND MF0833)

Dear Mr. Davison:

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 26, 2013 (ADAMS Accession No. ML13060A379), Northern States Power Company, a Minnesota corporation (the licensee), doing business as Xcel Energy, submitted its OIP for the Prairie Island Nuclear Generating Plant (PINGP), in response to Order EA-12-049. By letters dated August 26, 2013, February 26, 2014, August 25, 2014, and February 26, 2015 (ADAMS Accession Nos. ML13239A094, ML14057A771, ML14237A512, and ML15057A323, respectively), Xcel Energy submitted its first four six-month updates to the OIP. In addition, Xcel Energy supplemented the second six-month update by letter dated October 20, 2014 (ADAMS Accession No. ML14295A761). 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 PINGP interim staff evaluation (ISE) (ADAMS Accession No. ML14030A540) and continues with in-office and onsite portions of this audit.

By letter dated February 26, 2013 (ADAMS Accession No. ML13060A363), the licensee submitted its OIP for PINGP, in response to Order EA-12-051. By email dated July 11, 2013, (ADAMS Accession No. ML13205A355), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated August 6, 2013, August 26, 2013, February 26, 2014, August 25, 2014, and February 26, 2015 (ADAMS Accession Nos. ML13219A859,

ML13239A093, ML14057A647, ML14237A485, and ML15057A306, respectively), the licensee submitted its RAI responses and first four six-month updates to the OIP. The NRC staff's review to date led to the issuance of the PINGP ISE and RAI dated November 14, 2013 (ADAMS Accession No. ML13311A486). 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 PINGP from May 11 – 14, 2015, per the audit plan dated March 31, 2015 (ADAMS Accession No. ML15083A415). 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.

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

Sincerely,



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

Docket Nos. 50-282 and 50-306

Enclosure:
Audit report

cc w/encl: Distribution via Listserv

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
NORTHERN STATES POWER COMPANY
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2
DOCKET NOS. 50-282 AND 50-368

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 26, 2013 (ADAMS Accession No. ML13060A379), Northern States Power Company, a Minnesota corporation (the licensee), doing business as Xcel Energy, submitted its OIP for the Prairie Island Nuclear Generating Plant (PINGP), in response to Order EA-12-049. By letters dated August 26, 2013, February 26, 2014, August 25, 2014, and February 26, 2015 (ADAMS Accession Nos. ML13239A094, ML14057A771, ML14237A512, and ML15057A323, respectively), Xcel Energy submitted its first four six-month updates to the OIP. In addition, Xcel Energy supplemented the second six-month update by letter dated October 20, 2014 (ADAMS Accession No. ML14295A761). By letter dated August 28, 2013 (ADAMS Accession No. ML13234A503), the NRC notified all licensees and construction permit

Enclosure

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 PINGP interim staff evaluation (ISE) (ADAMS Accession No. ML14030A540) and continues with in-office and onsite portions of this audit.

By letter dated February 26, 2013 (ADAMS Accession No. ML13060A363), the licensee submitted its OIP for PINGP, in response to Order EA-12-051. By email dated July 11, 2013, (ADAMS Accession No. ML13205A355), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated August 6, 2013, August 26, 2013, February 26, 2014, August 25, 2014, and February 26, 2015 (ADAMS Accession Nos. ML13219A859, ML13239A093, ML14057A647, ML14237A485, and ML15057A306, respectively), the licensee submitted its RAI responses and first four six-month updates to the OIP. The NRC staff's review to date led to the issuance of the PINGP ISE and RAI dated November 14, 2013 (ADAMS Accession No. ML13311A486). 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 PINGP from May 11 – 14, 2015, per the audit plan dated March 31, 2015 (ADAMS Accession No. ML15083A415). 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 SFP Instrumentation (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" issued in August, 2012 (ADAMS Accession No. ML12242A378), as 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'" (ADAMS Accession No. ML12229A174) as providing one 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, Revision 1, "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 PINGP facility from May 11 – 14, 2015. The NRC audit team staff was as follows:

Title	Team Member
Team Lead/Project Manager	Peter Bamford
Technical Support	Matthew Hardgrove
Technical Support	Prem Sahay
Technical Support	Kevin Roche
Technical Support	Duc Nguyen

The NRC staff executed the onsite portion of the audit per the three part approach discussed in the March 31, 2015, 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 11, 2015)

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 titled "Prairie Island Nuclear Generating Plant On-site Audit Regarding Implementation of Mitigating Strategies (FLEX) and Reliable Spent Fuel Pool instrumentation Related to Orders EA-12-049 and EA-12-051." The licensee provided an overview of its strategy to maintain core cooling, containment, and SFP cooling in the event of a BDBEE, and the plant modifications being done in order to implement the strategies. The licensee also presented an overview of the FLEX equipment storage facility, the FLEX equipment that would be stored there, the interface

with the National SAFER Response Center (NSRC), and information regarding communications, procedures, and training. The presentation included an overview of the spent fuel pool level indication modifications.

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 tables in Attachments 3 and 4, 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 low-leakage reactor coolant pump 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 reviewed the licensee’s strategy for utilizing raw water sources (Mississippi River), including water filtration and monitoring of core parameters to ensure adequate cooling. 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 on 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 diesel-driven electrical generators (DGs). In order to support the licensee’s Phase 2 strategy, two DGs (480 volt, 300 kilowatt) will be deployed to supply electrical equipment necessary for the mitigating strategies implementation on both units. The licensee will have a backup DG available. The DGs will be stored in the FLEX storage building being constructed on the PINGP site. Further discussion of this configuration is contained in section 3.4 of this report. In addition, the NRC staff reviewed the licensee’s load and sizing calculations for the FLEX DGs.
- c. The NRC staff reviewed the licensee’s evaluation regarding equipment qualification during ELAP conditions.

3.3 SFPI Technical Discussions and Walk-Downs

The NRC staff walked down 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 toured the area where the FLEX storage building was under construction. The FLEX storage building is designed to survive all site hazards, however deployment is restricted during a maximum postulated flood event. Therefore, for a flooding scenario, the licensee will utilize the expected warning time and pre-deploy its FLEX equipment to an area protected from the floodwaters (turbine building). The NRC staff walked down equipment haul routes from the FLEX storage building to the designated deployment sites, and walked down haul routes from designated staging areas 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 walkdown included the location of the installed diesel-driven cooling water pumps, as well as the point of deployment for the portable FLEX pumps, hose routing and deployment connection points.
- c. The NRC staff reviewed the strategy that will be implemented by the licensee to refuel the installed and portable 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 (SG) power operated relief valves (PORVs). These valves will be operated manually during an extended loss of alternating current power (ELAP) event due to loss of their normal motive force for operation (instrument air). Locations and procedures for operation of the PORVs were reviewed by the staff.
- 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.
- f. The licensee's strategy involves the use of two FLEX DGs, both of which power equipment on each unit. One FLEX DG powers the Unit 1 and Unit 2 battery chargers, as well as a screenhouse Motor Control Center that supports both units. The other FLEX DG powers the Unit 1 and Unit 2 installed charging pumps used for RCS makeup. The licensee plans to have one spare FLEX DG in addition to these two DGs. The NRC staff noted that NEI 12-06 does not explicitly address this DG configuration in terms of determining how to establish what would comprise "N+1"

capability. Thus, the NRC staff considers the licensee's strategy of maintaining one "N+1" DG for this configuration to be an alternative to NEI 12-06. The NRC staff also notes that the licensee's original OIP dated February 26, 2013, indicated that there will be four FLEX DGs total (two spares).

4.0 Exit Meeting (May 14, 2015)

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 Attachments 3 and 4 of this report.

CONCLUSION

The NRC staff completed all three parts of the March 31, 2015, 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, Attachment 2 provides 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, Attachments 3 and 4 provide the status of all open audit review items that the NRC staff is evaluating in anticipation of issuance of a combined safety evaluation (SE) for both the mitigation strategies (MS) and SFPI orders. Attachments 3 and 4 include 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 are as follows:

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

While this report notes the completion of the onsite portion of the audit per the audit plan dated March 31, 2015, 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 Attachments 3 and 4 provide 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. PINGP MS/SFPI SE Audit Items currently under NRC staff review and requiring licensee input
4. PINGP MS/SFPI SE Audit Items currently under NRC staff review but not requiring licensee input

Onsite Audit Participants

NRC Staff:

Peter Bamford	NRR/JLD/JOMB
Matthew Hardgrove	NRR/DSS/SRXB
Prem Sahay	NRR/JLD/JERB
Duc Nguyen	NRR/JLD/JERB
Kevin Roche	NRR/JLD/JCBB

PINGP Staff:

Stevie DuPont	Licensing
Oley Nelson	Fukushima Team
Richard Pearson	Design Engineering
Jon Kapitz	Fukushima Project Director
Steve Schmidt	Operations Shift Manager
Erick Jun	Fukushima Response Engineering Supervisor
Lynne Gunderson	Licensing
Scott Lappegaard	Fukushima Implementation Manager
John Grubb	General Manager Fukushima Response
Brian Zelenak	Licensing Manager
Wayne Eppen	Operations Senior Reactor Operator Support
Corey Schoo	Fukushima Training Coordinator
Tony Perez	Project Manager
Joseph Mathew	Design Engineering Manager
Jody Nemcek	Fukushima Response Manager
Roth Trulson	Fukushima Project Manager - Building
Tom Fox	Project Manager-SFPI
Richard Rohrer	Hazards Analysis Manager-Fukushima Task Force
Phil Kramer	Non-licensed Operator
Brian Carberry	Emergency Preparedness Manager
Joe Jilk	Operations
BinhAn Ta	SFPI Design Engineer

Documents Reviewed

FLEX Support Guidelines (FSGs)

FSG-1, "Long Term RCS Inventory Control," Draft Rev. 1
FSG-3, "Alternate Low Pressure Feedwater," Draft Rev. 1
2FSG-4, "ELAP DC Bus Load Shed/Management," Draft Rev. 4
FSG-5, "Initial Assessment and FLEX Equipment Staging," Draft Rev. 2
FSG-8, "Alternate RCS Boration," Draft Rev. 1
FSG-10, "SI Accumulator Isolation," Draft Rev. 0
FSG-11, "Alternate SFP Makeup and Cooling," Draft Rev. 3

Procedures

AB-4, "Flood," Rev. 44
ECA 0.0, "Loss of All Safeguards AC Power," Draft Rev. 3
EDMG-2, "Guideline for Damage Mitigation Strategies," Attachment A, "SFP Strategies," Rev. 9
TP-1826, "OutPlant Safe Shutdown Equipment Check," Rev. 21
5AWI 5.3.0, "Key and Seal Control," Rev. 14
FP-OP-C00-22, "Shift Relief and Turnover," Rev. 0
AB-2, "Tornado/Severe Thunderstorm/High Winds," Rev. 38
D58.5.3, "Spent Fuel Pool (Divider) Gate Removal/Replacement," Rev. 7
FP-BDB-EQP-01, "Equipment Important to BDB Compliance," Rev. 0
H41, "Control of Temporary Structure and Equipment," Rev. 13
5AWI 8.5.0, "Housekeeping and Material Condition," Rev. 13
FP-BDB-CHNG-01, "FLEX Strategy Change Process," Rev. 0

Calculations/Analyses

ENG-ME-825, "Time to Onset of Reflux Cooling During ELAP," Rev. 1

ENG-ME-828, "FLEX Minimum RCS Makeup Flow with Unidentified Leakage," Rev. 0

Calculation NSP-07-33, "Loss of Offsite Power with Delayed AFW Analysis Results," Rev. 0

178599.51.3000.0001, "PINGP 480V Portable Diesel Generator Sizing for FLEX," Rev 0

178599.51.3000.0003, "PINGP 480V Portable Diesel Generator Sizing for Charging Pumps FLEX Power," Rev. 0

178599.51.3005, "Prairie Island – 4KV Generator Sizing Evaluation," Rev. 0

ENG-ME-830, "Sizing of FLEX Diesel Storage Tank," Rev. 1

178599.51.2016, "Calculation for Sizing Portable FLEX SG and SFP Makeup Pump," Rev. 0

ENG-EE-199, "FLEX Strategy Battery Depletion Calculation," Rev. 0

178599.51.2010, "Prairie Island Spent Fuel Pool Pump NPSH," Rev. 1

178599.51.2011, "Prairie Island – Dose at SFP level Instrument," Rev. 1

00Q4159-C-001, "PINGP Floor Response Spectra," Rev. 0

S-12385-080-02, "Seismic Qualification of MOHR EFP-IL Electronics Enclosure and Battery Box," Rev. 0

S-12385-080-01, "Evaluation of the Mounting Brackets for the Spent Fuel Pool Level Probe Assembly," Rev. 0

EVAL-XCELPI12-02, "Main Control Room, Cable Spreading Room and Computer Room PRA Room Heat Up Evaluation with Loss of HVAC," Rev. 1

Drawings

NF-40022-1, "Circuit Diagram 4KV and 480V Safeguard Buses Unit1," Rev. 76

NF-40022-2, "Circuit Diagram 4KV and 480V Safeguard Buses Unit 2," Rev. 77A-1

NF-40406, Sheet 19, "21 Battery Room MCC2AC Bus 1," Rev. 75

NF-40406, Sheet 65, "22 Battery Room MCC 2AC Bus 2," Rev. 75

NF-40026, "480V Motor Control Center 1A, 1AA, 1 Circuit Diagram," Rev. 76

NF-40426, "480V Circuit Diagram Motor Control Center 2K, 2KA," Rev. 76

SK-EC22374-09, "Phase 2 FLEX Portable DG Locations and Cable Route/Bus Connection," Rev. 0

NF-40115-2, "Auxiliary Bldg, Unit 1 Cable Tray System Fuel Handling Floor Plan," Rev. N

NF-40115-1, "Cable Tray System Ventilating Fan Floor Plan Auxiliary Building – Unit 1," Rev. W

NF-40114-1, "Cable Tray System Oper. FL. Plan Auxiliary Building – Unit 1," Rev. AR

NF-40125-10C, "Cable Tray System – Riser Supports Aux Bldg. – Unit 1," Rev. L

NF-40118-4, "Cable Tray System Relay Room Sectional Plan M-M Unit 1&2," Rev. P

NF-40115-2, "Auxiliary Bldg. – Unit 1 Cable Tray System Fuel Handling Floor Plan," Rev. N

NF-40114-2, "Cable Tray System Operating Floor Plan Auxiliary Building – Unit 1," Rev. AB

NF-40477, "Cable Tray System Oper. Floor Plan – Auxiliary Bldg. – Unit 2," Rev. AG

NF-40479-5, "Cable Tray System – Oper. & Fan Fl. Sect's Auxiliary Bldg, Unit 2," Rev. H

SK-EC22374-07, "FLEX-RCSI Make Up Phase 3," Rev. 0

SK-PINGP-EC23555-S01, "Spent Fuel Pool Level Instrumentation Probe Support," Rev. 0

1-0430-17, "SFP-1 Probe Interface," Rev. 0

1-0430-18.1, "SFP Probe Reaction Forces SONGs-CGS-RRS Spectra," Rev. 2

NF-74564-2, "120/208 A.C. UPS Distribution Panel 3133, 3143, 4133 & 4143 One Line Diagram," Rev. 77

NF-88597, "Circuit Diagram Computer UPS 33, 43, 34 & 44," Rev. A

Other Documents:

AREVA Engineering Information Record Document No 51-9199717-013, "National SAFER Response Center Equipment Technical Requirements"

GD-031315, "Geotechnical-Liquefaction Evaluation for the FLEX Storage Building," Rev. 0, dated March 26, 2015

Westinghouse letter LTR-LIS-14-219, "Documentation of Westinghouse 2-Loop, 3-Loop, and 4-Loop Analysis Input Information for Task 1 of PA-ASC-1272"

"Prairie Island Nuclear Generating Plant Beyond Design Basis FLEX Program," Rev. Draft

WCAP-17601-P, "Reactor Coolant System Response to the Extended Loss of AC Power Event for Westinghouse, Combustion Engineering and Babcock & Wilcox NSSS Designs," Rev. 1

"SAFER Response Plan for Prairie Island Nuclear Generating Plant," Rev. Draft, dated August 14, 2014.

Specification H8-H, "PINGP Environmental Specification," Rev. 7

Specification E201-0001-002, "480 VAC FLEX Portable Diesel Generator for Battery and Screen House MCC's," Rev. 0

Specification E201-0001-001, "480 VAC FLEX Portable Diesel Generator for Charging Pump MCC's," Rev. 0

Specification M484-0001-001, "FLEX Portable SG Makeup Pump," Rev 0

Specification A105-0005-001, "FLEX Equipment Storage Building (One Building Option)," Rev. 1

RFP-20677-398, "Technical Information, Proposal #1, PINGP FLEX Building Portable Pumps," dated March 19, 2015

SL-012821, "PINGP FLEX Coordination Evaluation," Rev. 0

DBD-SYS-12A, "Design Bases Document for the Chemical and Volume Control System," Rev. 3

Engineering Change (EC) 23555, "Fukushima Response Spent Fuel Pool Instrumentation," Rev. 0

PINGP Updated Safety Analysis Report, Rev. 33

MOHR Report 1-0410-9, "MOHR SFP-1 Level Probe Assembly Seismic Analysis Report," Rev. 2

1-0410-6, "MOHR EFP-IL SFPI System Seismic Test Report," Rev. 1

1-0410-16, "MOHR SFP-1 Level Probe Assembly Shock and Vibration Test Report," Rev. 0

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

Construction Change Notice (CCN) EC23555-02 for Drawing SK-PINGP-EC23555-S01

Preventative Maintenance Change Request (PMCR) 1477775, "Create New FLEX PMs for Periodic Electrical Equipment Replacement"

PMCR 1477776, "Create New FLEX PMs for Periodic Mechanical Equipment Replacement"

PMCR 1431335, "New Maintenance PM for Spent Fuel Pool Instrumentation"

Procedure Change Request (PCR) 1443058-26, "Add a Channel Check Type of Action for Both Channels of SFPLV (PINGP 97)"

PCR 1443055-41, "Add a Channel Check Type of Action for Both Channels of SFPLV (PINGP 1087)"

Action Request (AR) Process Items

AR01478950 (General Action Request), "Incorporate Freeze Protection Strategy in FLEX FSGs"

AR 01478741 (General Action Request), "Fukushima FLEX Portable Generator Breaker Coordination"

AR 01479018 (Corrective Action Program), "Fukushima – FSG-4 Requires Amp Revision Based on Field Amperes"

AR 01479029 (Corrective Action Program), "2FSG-3 Step 6 – Needs to be Changed for 2R29 Compliance"

AR 01472374 (Corrective Action Program), "FLEX Requires Manual Operation MV32246/32247 for Aux Feed to Steam Generators"

PINGP
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 Description	Licensee Input Needed
CI 3.1.1.2.A	FLEX Equipment Deployment - access to connection points through seismically robust structures.	Evaluate the Turbine Building pathway for seismic robustness and make the evaluation available for NRC review when completed.
CI 3.2.4.9.A	Portable Equipment Fueling Strategy.	Evaluate seismic robustness of preferred onsite fuel oil source or provide a refueling strategy that includes use of a seismically robust source.
SE.16	SFP Spray Flow - the number of protected B5b pumps and inability to deliver 500 gallons per minute under low river level conditions (downstream seismic dam failure) appears to be an alternative to NEI 12-06.	Provide an updated strategy or basis for an alternative to the SFP spray provisions of NEI 12-06.
SE.18	Develop integrated flooding strategy	Provide integrated strategy for NRC review when developed
SE.19	Accumulator borated water injection calculation.	Provide a basis for the RCS vs SG pressure differential assumed in the borated water calculation, or provide a revised calculation that can be supported.
SE.20	The licensee's OIP dated February 26, 2013, indicates that there will be two FLEX DGs to support the overall strategy and that there will be two spare DGs to comprise "N+1" capability (four total). During the onsite audit it was identified that there will be only one spare "N+1" DG (three total).	Provide justification for having one "N+1" DG. Include a discussion of the interchangeability between the three DGs, as well as a discussion of how the proposed configuration meets the intent of NEI 12-06.

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Mitigation Strategies/Spent Fuel Pool Instrumentation Safety Evaluation Audit Items:

Audit Items Currently Under NRC Staff Review, But Not Requiring Further Licensee Input

Audit Item Reference	Item Description	Action
CI 3.2.1.2.A	RCP Seal Leakage - FlowServe N-9000 seals with abeyance seal option.	NRC review and acceptance of Flowserve white paper

ML13239A093, ML14057A647, ML14237A485, and ML15057A306, respectively), the licensee submitted its RAI responses and first four six-month updates to the OIP. The NRC staff's review to date led to the issuance of the PINGP ISE and RAI dated November 14, 2013 (ADAMS Accession No. ML13311A486). 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 PINGP from May 11 – 14, 2015, per the audit plan dated March 31, 2015 (ADAMS Accession No. ML15083A415). 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.

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

Sincerely,

/RA/

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

Docket Nos. 50-282 and 50-306

Enclosure: Audit report

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