



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

December 14, 2016

Vice President, Operations
Entergy Nuclear Operations, Inc.
James A. FitzPatrick Nuclear Power Plant
P.O. Box 110
Lycoming, NY 13093

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT - 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. MF1077 AND MF1076)

Dear Sir/Madam:

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. ML13063A287), Entergy Nuclear Operations, Inc. (Entergy, the licensee), submitted its OIP for James A. FitzPatrick Nuclear Power Plant (JAF) in response to Order EA-12-049. By letters dated August 28, 2013, February 28, 2014, August 28, 2014, February 27, 2015, August 28, 2015, February 26, 2016 and August 25, 2016 (ADAMS Accession Nos. ML13241A204, ML14059A359, ML14241A261, ML15058A587, ML15240A370, ML16057A603, and ML16238A521, respectively), the licensee submitted its first seven 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). The audit process led to the issuance of the JAF interim staff evaluation (ISE) dated February 21, 2014 (ADAMS Accession No. ML14007A681), and continues with in-office and onsite portions of this audit.

By letter dated February 28, 2013 (ADAMS Accession No. ML13063A267), the licensee submitted its OIP for JAF, in response to Order EA-12-051. By letter dated August 29, 2013 (ADAMS Accession No. ML13226A534), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated August 28, 2013, October 3, 2013, February 28, 2014, August 28, 2014, February 27, 2015, August 28, 2015, February 26, 2016 and August 25, 2016 (ADAMS Accession Nos. ML13241A206, ML13276A483, ML14059A427, ML14241A263, ML15058A607, ML15240A377, ML16057A632, and ML16238A522, respectively), the licensee

submitted its RAI responses and first seven six-month updates to the OIP. The NRC staff's review to date led to the issuance of the JAF ISE and RAI dated December 12, 2013 (ADAMS Accession No. ML13338A645). 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 JAF from October 24 - 27, 2016, per the audit plan dated September 27, 2016 (ADAMS Accession No. ML16252A387). 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 Bamford, Senior Project Manager
Orders Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-333

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
ENTERGY NUCLEAR OPERATIONS, INC.
JAMES A. FITZPATRICK NUCLEAR POWER PLANT
DOCKET NO. 50-333

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. ML13063A287), Entergy Nuclear Operations, Inc. (Entergy, the licensee), submitted its OIP for James A. FitzPatrick Nuclear Power Plant (JAF, FitzPatrick) in response to Order EA-12-049. By letters dated August 28, 2013, February 28, 2014, August 28, 2014, February 27, 2015, August 28, 2015, February 26, 2016 and August 25, 2016 (ADAMS Accession Nos. ML13241A204, ML14059A359, ML14241A261, ML15058A587, ML15240A370, ML16057A603, and ML16238A521, respectively), the licensee submitted its first seven 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

Enclosure

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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 JAF from October 24 - 27, 2016, per the audit plan dated September 27, 2016 (ADAMS Accession No. ML16252A387). 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, 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 JAF facility from October 24 – 27, 2016. The NRC audit team staff was as follows:

Title	Team Member
Team Lead/Project Manager	Peter Bamford
Technical Support	Garry Armstrong
Technical Support	Brian Lee
Technical Support	Matthew McConnell
Technical Support	Joshua Miller
Technical Support	Khoi Nguyen

The NRC staff executed the onsite portion of the audit per the three part approach discussed in the September 27, 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 (October 24, 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 Mitigation 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 "FitzPatrick FLEX/SFPI/EP-Comm NRC Audit." 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 the planned location of the FLEX equipment storage facilities, the FLEX equipment that would be stored there, the interface with the National Strategic Alliance of FLEX Emergency Response (SAFER) Response Center (NSRC), and information regarding communications, preventative maintenance, procedures, and training. The presentation included an overview of the spent fuel pool level indication modification.

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/Balance-of-Plant Systems Technical Discussions and Walk-Downs

The NRC staff met with licensee staff to discuss the amount of leakage from the recirculation pump seals, reactor pressure vessel (RPV) makeup strategy, the availability of water sources, and the ability to remove heat from the RPV. Similarly the staff reviewed the licensee's provisions for SFP cooling/make-up. These reviews included the applicable analyses and flow calculations. The NRC staff also walked down the licensee's strategies and reviewed plant procedures for implementing the core/SFP 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 FLEX electrical generators. In order to support the licensee's Phase 2 strategy, one 480 volt electrical generator will be deployed. The licensee will have a second backup ("N+1") generator available. The two generators will be stored (one each) in the two FLEX storage buildings planned for construction on the JAF site. The staff reviewed the licensee's load and sizing calculations for 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 walk-down. 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 areas where the two FLEX storage buildings are planned for construction. The FLEX storage buildings are designed to survive all site hazards except tornado missiles. The licensee located the two buildings with a separation distance designed to comply with the provisions of NEI 12-06 to account for the potential of tornado missiles. The NRC staff walked down equipment haul routes from the "N+1" FLEX storage building location 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 the RPV inventory and SFP inventory functions. In Phase 2 of the event the licensee proposes to use an alternative to the NEI 12-06 (Revision 0) provision for portable pumps through the use of the two installed diesel-driven fire water pumps for RPV and SFP makeup. The staff walked down the necessary hose routes and deployment connection points (primary and alternate) that would be used in this strategy.
- 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 safety relief valves (SRVs). The NRC staff reviewed the capability to operate the SRVs during an extended loss of alternating current power (ELAP).
- e. The containment/core cooling strategy relies on the ability to vent containment at proper point in the event. The licensee plans to use the existing containment vent to accomplish this function. The staff walked down the accessible portions of the vent path and also reviewed the plan for venting, including the necessary valves to be operated, ductwork provisions, and door openings needed to control the venting process.
- f. 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 emergency response organization (ERO) features, lighting and communication features during plant walk-downs.

4.0 Exit Meeting (October 27, 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 are still under NRC review are detailed in Attachment 3 of this report.

CONCLUSION

The NRC staff completed all three parts of the September 27, 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, 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, Attachment 3 provides 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 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. Mitigation strategies ISE open Items and confirmatory items
- b. Mitigation strategies audit questions (AQs)
- c. Licensee-identified 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 September 27, 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. JAF Mitigation Strategies/SFPI SE Audit Items Currently Under
NRC Staff Review

Onsite Audit Participants

NRC Staff:

Peter Bamford	NRR/JLD/JOMB
Garry Armstrong	NRR/JLD/JCBB
Brian Lee	NRR/JLD/JCBB
Matthew McConnell	NRR/JLD/JERB
Joshua Miller	NRR/JLD/JERB
Khoi Nguyen	NRR/JLD/JERB

JAF Staff:

Dan Jacobsen	Entergy Fukushima Project Site Engineering Lead
Scott Martin	Entergy Fukushima Project Fleet Engineering Lead
Matthew Rohrer	Entergy Fukushima Project Site Engineering Lead
Michael Krupa	Entergy Fukushima Project Fleet Program Director
Mark Hawes	Entergy JAF Regulatory Assurance Specialist
David Stallings	Entergy Site Fukushima Project Engineering Supervisor
William Drews	Entergy JAF Regulatory Assurance Manager
Roger Locey	Entergy Site Fukushima Project Operations Liaison
Paul Brozenich	Entergy Site Fukushima Project ERO Logistics Lead
Fred Gynn	Entergy Fukushima Project ERO Logistics
Jeff Brown	Entergy Fukushima Project SFPI Lead
Kirk Jenks	Entergy Fukushima Project Procedures/Training Lead
Yaruan Cai	Entergy Site Fukushima Project Engineer (Mechanical)
Melvin Griffiths	Entergy Site Fukushima Project Manager (Site)
Michael Humphries	Entergy Site Fukushima Project Engineer (Elect/I&C)
Eugene Desir	Entergy Site Fukushima Project Engineer (Civil/Structural)
Lindsey Wilson	Entergy JAF Training Supervisor
Chris Smolinski	Entergy JAF Operations Support Manager
Gautam Kakaiyh	Enercon Services Lead Responsible Engineer
Jamie Proser	Enercon Services Fukushima Program Director
Michael Cymbor	Enercon Services Mechanical Engineering Supervisor
John Pellicone	Enercon Services Electrical Engineering/I&C Lead
Jeffrey Head	Enercon Services Safety Analysis Lead
Phil Amway	Exelon

Documents Reviewed

FLEX Support Guidelines (FSGs)

FSG-ELAP, "Overall Strategy Implementation," Rev. 0
FSG-001, "Initial Assessment and FLEX Equipment Staging," Rev. 0
FSG-002, "ELAP DC Bus Load Shed and Management," Rev. 0
FSG-003, "Alternate Reactor Vessel Cooling," Rev. 0
FSG-004, "Alternate Containment Cooling," Rev. 0
FSG-005, "Alternate Spent Fuel Pool Makeup and Cooling," Rev. 0
FSG-006, "Loss of Vital Instrumentation or Control Power," Rev. 0
FSG-007, "Long Term Reactor Vessel Cooling," Rev. 0
FSG-008, "Transition from FLEX Equipment," Rev. 0

Procedures

AP-12-04, "Seasonal Weather Preparations," Rev. 24
EN-OP-115, "Operator Rounds," Rev. 1
ODSO-4, "Shift Turnover and Logkeeping," Rev. 118
EN-RP-123, "Control of Highly Irradiated Objects," Rev. 1
AP-17.03, "Spent Fuel Pool Material Control," Rev. 11
MP-004.25, "Transfer of Control Blades in the Spent Fuel Pool Using Control Blade Hangers," Rev. 2
MP-004.18, "LPRM Removal and Installation," Rev. 4
MP-004.20, "IRM/SRM Instrument Dry Tube Removal and Installation," Rev. 2
EN-DC-324, "Preventive Maintenance Program," Rev. 17
EN-OU-108, "Shutdown Safety Risk Procedure," Rev. 8

Calculations/Analyses

ENTGFZX031-CALC-005, "Rocking and Sliding Evaluation of Equipment Inside FLEX Equipment Storage Building," Draft Rev. 0

JAF-CALC-14-00025, "Spent Fuel Pool Instrumentation Shielding Calculation," Rev. 0

JAF-CALC-14-00027, "Temperature Evaluation of Battery Room and DC Equipment Room During Extended Loss of Offsite Power (FLEX)," Rev. 0

JAF-CALC-14-00028, "Battery Room Hydrogen Generation for a FLEX Event," Rev. 0

JAF-CALC-15-00005, "Spent Fuel Pool Level Probe Mounting Bracket Evaluation," Rev. 0

JAF-CALC-15-00012, "Hydraulic Analysis of Phase 2 FLEX Strategies," Rev. 0

JAF-CALC-15-00025, "Reactor Building Heat Up During Extended Loss of AC Power," Rev. 0

JAF-CALC-15-00030, "Freezing of Coolant Sources for FLEX Event," Rev. 0

JAF-CALC-15-00031, "FLEX Strategy - Portable Generator System Sizing," Rev. 0

JAF-CALC-15-00044, "FitzPatrick Nuclear Plant Containment Analysis of FLEX Strategies," Rev. 0

JAF-CALC-15-00045, "Station Service Batteries A and B Discharge Capacity during Extended Loss of AC Power," Rev. 0

JAF-CALC-15-00046, "RCIC Room Heatup for an Extended Loss of all AC Power (FLEX)," Rev. 0

JAF-CALC-MISC-04509, "Main Control Room Heat-Up During Extended Loss of Offsite Power (FLEX)," Rev. 5

JAF-RPT-5-00015, "Building Area Accessibility Report for FLEX Operator Actions," Rev. 0

JAF-RPT-15-00018, "JAF FLEX Storage Location Separation Distance," Rev. 0

JAF-RPT-MISC-04046, "Environmental Qualification Service Conditions," Rev. 0

Drawings

Drawing SK-EC52728-14, "SFPI Power Single Line Diagram Electrical," Rev. 0

FE-1B, "Main One Line Diagram SH.2 Station Service Transformers," Rev. 14

Other Documents

“Report of Geotechnical Evaluation, FLEX Equipment Storage Building Sites, Staging Area B, Helicopter Landing Zone and Travel Paths, James A. FitzPatrick (JAF) Nuclear Power Plant Oswego County New York,” Enercon Project No. ENTGFZX044, dated August 8, 2016.

Specification titled, “N+1 FLEX Storage Building Design Requirements Document,” Rev.1, dated September 15, 2016

Specification titled “N FLEX Storage Building Design Requirements Document,” Rev.1, dated September 15, 2016

AREVA Document 38-924576, “SAFER Response Plan for James A. Fitzpatrick Nuclear Power Plant,” Rev. 1, dated September 9, 2015

Engineering Report 3971, “Cooling Water Intake at the JAFNPP: A Study on the Potential for Blocking by Frazil Ice, Grease Ice, and Slush,” Rev. 1

NAI-1725-004, “Seismic Induced Hydraulic Response in the CGS Spent Fuel Pool,” Rev. 3 (proprietary)

Engineering Change (EC) 52736, “Fukushima FLEX Basis,” draft Rev. 0

Attachment 6.001, “Frazil Ice”

Attachment 6.002, “Diesel Driven Fire Pumps 76P-1 and 76P-4”

Attachment 6.004, “Required Instrumentation to Monitor FLEX Portable Equipment”

Attachment 6.005, “Negative Containment Pressure”

Attachment 6.006, “Ventilation for Portable Diesel Generators and Diesel Fire Pumps”

Attachment 6.010, “Seismic Evaluation of 76P-4”

Attachment 6.014, “Evaluation of Power Requirement for Reactor Building Track Bay Door”

Attachment 6.018, “Internal Flooding from Non-seismic Sources”

Attachment 6.021, “Evaluation of Potential Impacts Due to Snow, Ice and Extreme Cold on FLEX Required SSCs and Strategy”

Attachment 6.025, “Evaluation of FLEX Event Diesel Fuel Usage”

Attachment 6.027, “NSRC Pump Deployment Location”

Attachment 6.028, "FLEX Debris Removal Assessment for James A. FitzPatrick (JAF)"

Attachment 6.033, "Evaluation of Ventilation in Battery Rooms"

Attachment 8.005, "Evaluation of Permanently Installed Plant Equipment Credited for FLEX Strategy" (JAF-RPT-15-00017)

Attachment 8.006, "Building Area Accessibility Report for FLEX Operator Actions" (JAF-RPT-15-00015)

Engineering Change Package EC52728, "Fukushima – Spent Fuel Pool Level Instrument" Rev. 0

EC 59274, "Fukushima N+1 Storage Building," Rev. 0

EC 53903, "FLEX Emergency Plan (EP) Communication Modifications to Support NEI 12-01," Draft Rev. 0

Action Request (AR) 261466

AR 261473

AR 261484

AR 261453

AR 261482

Mohr Reports (proprietary)

1-0410-1, "MOHR EFP-IL SFPI System Temperature and Humidity Report," Rev. 0

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

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

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

1-0410-12, "EFP-IL Signal Processor Operator's Manual," Rev. 1

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

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

1-1010-2, "EFP-IL MOD 1 Modification Package," Rev. 0

JAF

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

Audit Items Currently Under NRC Staff Review

Audit Item Reference	Item Summary Description	Status
AQ.19	Provide additional information regarding the installed diesel driven fire pump and the associated piping, fuel supply and support equipment to demonstrate that it is protected against all postulated BDBEEs.	Pending - NRC staff review is ongoing of the licensee's diesel driven fire pumps' robustness evaluation including associated piping and equipment.
SE.8	Provide a discussion/analysis on the ability of electrical and mechanical equipment (i.e., valve solenoids, instruments, relays, etc.) located within containment and other areas of the plant (i.e., Main Control Room, RCIC [reactor core isolation cooling] Pump Room, SRV areas, Switchgear Rooms, Battery Rooms, etc.) that is relied upon during an ELAP to function in the expected environmental conditions (for both extreme high and low temperatures) for the duration of the ELAP event (i.e., indefinitely).	Pending - NRC staff review is ongoing of the licensee's ELAP environmental evaluation of the SRV components to confirm their ability to function for the full mission time.

submitted its RAI responses and first seven six-month updates to the OIP. The NRC staff's review to date led to the issuance of the JAF ISE and RAI dated December 12, 2013 (ADAMS Accession No. ML13338A645). 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 JAF from October 24 - 27, 2016, per the audit plan dated September 27, 2016 (ADAMS Accession No. ML16252A387). 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 Bamford, Senior Project Manager
Orders Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-333
Enclosure: Audit report
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NAME	PBamford	SLent	SBailey
DATE	12/7/2016	12/14/2016	12/14/2016
OFFICE	NRR/JLD/JERB/BC	NRR/JLD/JOMB/BC(A)	NRR/JLD/JOMB/PM
NAME	SBailey	MHalter	PBamford
DATE	12/14/2016	12/14/2016	12/14/2016