



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

November 24, 2015

Vice President, Operations
Entergy Operations, Inc.
Grand Gulf Nuclear Station
P.O. Box 756
Port Gibson, MS 39150

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 – REPORT FOR THE ONSITE
AUDIT REGARDING IMPLEMENTATION OF MITIGATING STRATEGIES AND
RELIABLE SPENT FUEL POOL INSTRUMENTATION RELATED TO ORDERS
EA-12-049 AND EA-12-051 (TAC NOS. MF0954 AND MF0955)

Dear Sir or 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 27, 2013 (ADAMS Accession No. ML13059A316), Entergy Operations, Inc. (Entergy, the licensee) submitted its OIP for Grand Gulf Nuclear Station, Unit 1 (Grand Gulf) in response to Order EA-12-049. By letters dated August 28, 2013, February 28, 2014, August 26, 2014, and February 19, 2015 (ADAMS Accession Nos. ML13240A264, ML14059A080, ML14239A316, and ML15054A537, respectively), Entergy submitted its first four 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 Grand Gulf interim staff evaluation (ISE) dated February 19, 2014 (ADAMS Accession No. ML14007A718), and continues with in-office and onsite portions of this audit.

By letter dated February 26, 2013 (ADAMS Accession No. ML13064A417), the licensee submitted its OIP for Grand Gulf in response to Order EA-12-051. By letter dated July 30, 2013 (ADAMS Accession No. ML13207A124), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated August 29, 2013, August 28, 2013, February 28, 2014, August 27, 2014, and February 18, 2015 (ADAMS Accession Nos. ML13246A175, ML13240A265, ML14059A083, ML14239A659, and ML15049A273, respectively), the licensee submitted its RAI responses and first four six-month updates to the OIP. The NRC staff's review led to the issuance of the Grand Gulf ISE and RAI dated November 25, 2013 (ADAMS Accession No. ML13316B986). 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.

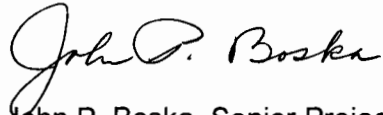
The ongoing audit process, to include the in-office and onsite portions, allows the staff to assess whether it has enough information to make a safety evaluation of the Integrated Plans. The audit allows the staff to review open and confirmatory items from the mitigation strategies ISE, RAI responses 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 information, identifies additional information necessary for the licensee to supplement its plan, and identifies any staff potential concerns. The audit's onsite portion took place prior to declarations of compliance for Grand Gulf.

In support of the ongoing audit of the licensee's OIPs, as supplemented, the NRC staff conducted an onsite audit at Grand Gulf from October 19-22, 2015, per the audit plan dated August 27, 2015 (ADAMS Accession No. ML15237A337). 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 a successful path for compliance with the Mitigation Strategies and SFPI orders. The onsite activities included detailed analysis and calculation discussions, walk-throughs of strategies and equipment laydown, visualization of portable equipment storage and deployment, review of staging and deployment of offsite equipment, and review of installation details for 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 301-415-2901 or by e-mail at John.Boska@nrc.gov.

Sincerely,

A handwritten signature in black ink that reads "John P. Boska". The signature is written in a cursive style with a large initial "J" and a distinct "P" and "B".

John P. Boska, Senior Project Manager
Orders Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-416

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 OPERATIONS, INC
GRAND GULF NUCLEAR STATION, UNIT 1
DOCKET NO. 50-416

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 their 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 27, 2013 (ADAMS Accession No. ML13059A316), Entergy Operations, Inc. (Entergy, the licensee) submitted its OIP for Grand Gulf Nuclear Station, Unit 1 (Grand Gulf) in response to Order EA-12-049. By letters dated August 28, 2013, February 28, 2014, August 26, 2014, and February 19, 2015 (ADAMS Accession Nos. ML13240A264, ML14059A080, ML14239A316, and ML15054A537, respectively), Entergy submitted its first four 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

Enclosure

Nuclear Reactor Regulation (NRR) Office Instruction LIC-111, "Regulatory Audits" (ADAMS Accession No. ML082900195). This audit process led to the issuance of the Grand Gulf interim staff evaluation (ISE) dated February 19, 2014 (ADAMS Accession No. ML14007A718), and continues with in-office and onsite portions of this audit.

By letter dated February 26, 2013 (ADAMS Accession No. ML13064A417), the licensee submitted its OIP for Grand Gulf in response to Order EA-12-051. By letter dated July 30, 2013 (ADAMS Accession No. ML13207A124), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated August 29, 2013, August 28, 2013, February 28, 2014, August 27, 2014, and February 18, 2015 (ADAMS Accession Nos. ML13246A175, ML13240A265, ML14059A083, ML14239A659, and ML15049A273, respectively), the licensee submitted its RAI responses and first four six-month updates to the OIP. The NRC staff's review led to the issuance of the Grand Gulf ISE and RAI dated November 25, 2013 (ADAMS Accession No. ML13316B986). 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 audit process, to include the in-office and onsite portions, allows the staff to assess whether it has enough information to make a safety evaluation of the Integrated Plans. The audit allows 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 information, identifies additional information necessary for the licensee to supplement its plan, and identifies any staff potential concerns.

In support of the ongoing audit of the licensee's OIPs, as supplemented, the NRC staff conducted an onsite audit at Grand Gulf from October 19-22, 2015, per the audit plan dated August 27, 2015 (ADAMS Accession No. ML15237A337). 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 a successful path for compliance with the Mitigation Strategies and SFPI orders. The onsite activities included detailed analysis and calculation discussions, walk-throughs of strategies and equipment laydown, visualization of portable equipment storage and deployment, review of staging and deployment of offsite equipment, and review of installation details for SFPI equipment. The audit's onsite portion took place prior to declarations of compliance for Grand Gulf.

Following the licensee's declarations of order compliance, the NRC staff will evaluate the OIPs, as supplemented, the resulting site-specific Overall Program Documents/Final Integrated Plans, 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 Project 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, "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 Grand Gulf facility from October 19, 2015, through October 22, 2015. The NRC audit team staff was as follows:

Title	Team Member	Organization
Team Lead/Project Manager	John Boska	NRR/JLD
Technical Support – Electrical	Kerby Scales	NRR/JLD
Technical Support – Reactor Systems	Joshua Miller	NRR/JLD
Technical Support – Balance of Plant	Michael Levine	NRR/JLD
Technical Support – Containment	Brian Lee	NRR/JLD
Technical Support – I&C	Khoi Nguyen	NRR/JLD

The NRC staff executed the onsite portion of the audit per the three part approach discussed in the audit plan, to include conducting a tabletop discussion of the site's integrated mitigating strategies (MS) 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 19, 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 describing the site's strategies to meet the NRC orders. The licensee reviewed its strategy to maintain core cooling, containment, and SFP cooling in the event of an extended loss of alternating current power (ELAP), and the plant modifications being done in order to implement the strategies. Also reviewed

was the design and location of the storage facilities for the FLEX equipment, the interface with the National Strategic Alliance for FLEX Emergency Response (SAFER) Response Centers (NSRC) including staging areas, the spent fuel pool level indication modification, the modifications planned to enhance emergency communications, and procedural enhancements such as development of FLEX support guidelines (FSGs).

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 review for the items listed in the plan. Any additional review items needed from the licensee 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 recirculation pump seals, the use of the reactor core isolation cooling (RCIC) system to maintain reactor pressure vessel (RPV) level, the use of the safety relief valves to remove decay heat and depressurize the RPV, the availability of water sources, the heatup of the suppression pool due to steam release from the RPV and RCIC, and the venting of the containment to remove heat from the suppression pool. 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, 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 strategies 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 FLEX electrical generators. One portable 480 volt alternating current (Vac) 300 kilowatt (kW) FLEX diesel generator (DG) will be located in the north FLEX storage building (FSB) and an identical 480 Vac 300 kW FLEX DG in the south FSB. After the initiating event, one 480 Vac 300 kW FLEX DG will be moved near the control building or the auxiliary building and portable cables will be run inside the building to reenergize important equipment such as the battery chargers. Additional smaller FLEX DGs are used for various electrical loads. The staff reviewed the licensee's load and sizing calculations for the FLEX DGs.

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. A concern with instrument channel conduit separation was 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 locations of the two FSBs, which have the same design parameters. Basic construction has been completed on both FSBs. The FSBs each will hold a full set of FLEX equipment, and have physical separation such that is very unlikely that a tornado would damage both FSBs. The NRC staff reviewed the equipment haul routes from the FSBs 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, reactor coolant system inventory, and SFP inventory functions. This included the point of deployment for the portable FLEX pumps, hose routing and deployment connection points (primary and alternate).

c. The NRC staff reviewed the strategy that will be implemented by the licensee to refuel the 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 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 needs during plant walkdowns.

4.0 Exit Meeting (August 6, 2015)

The NRC staff audit team conducted an exit meeting with licensee staff following the closure of onsite audit activities. The NRC staff highlighted items reviewed and noted that the results of the onsite audit trip will be documented in this report. There was one FLEX issues and one SFPI issue open at the conclusion of the audit and they were discussed at the exit meeting. See Attachment 3 for additional information.

CONCLUSION

The NRC staff completed all three parts of the 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 MS and SFPI orders. The five sources for the audit items referenced below are as follows:

- a. Interim Staff Evaluation (ISE) Open Items (OIs) and Confirmatory Items (CIs)
- b. Audit Questions (AQs)
- c. Licensee-identified Overall Integrated Plan (OIP) Open Items (OIs)
- d. SFPI Requests for Additional Information (RAIs)
- e. Additional information needed to support the SE

The attachments provide audit information as follows:

- a. Attachment 1: List of NRC staff and licensee staff audit participants
- b. Attachment 2: List of documents reviewed during the onsite audit
- c. Attachment 3: MS/SFPI SE Audit Items currently under NRC staff review (licensee input needed as noted)

While this report notes the completion of the onsite portion of the audit per the audit plan dated August 27, 2015, the ongoing audit process continues as per the 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 list of currently open items, 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 status of the NRC staff's review will be communicated in the ongoing audit process.

Attachments:

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

Onsite Audit Participants

NRC Staff:

John Boska	NRR/JLD/JOMB
Kerby Scales	NRR/JLD/JERB
Joshua Miller	NRR/JLD/JERB

Brian Lee	NRR/JLD/JOMB
Khoi Nguyen	NRR/JLD/JERB
Michael Levine	NRR/JLD/JCBB

Grand Gulf Staff:

Greg Hawkins	Sr. Manager, Site Project and Maintenance Services
Bryan Warren	Sr. Staff Design Engineer
Frank Weaver	Operations Shift Manager
John Booth	Project Manager
Karl Ehrhardt	Superintendent, Mechanical
Dykes Cupstid	Projects
Charlie Roberts	FLEX Procedure Writer
Richard Van Den Akker	Senior Emergency Planner
Dennis Coulter	Senior Technical Instructor
Mike Sweeney	Operations
Dana Smith	Senior Operations Instructor
James Nadeau	Manager, Regulatory Assurance
Richard Scarbrough	Licensing Specialist
Sherri Sweet	Regulatory Assurance
Jared Monroe	Licensing and Safety Analysis, ENERCON
Jeffrey Head	Licensing and Safety Analysis, ENERCON
Gary Smith	Licensing and Safety Analysis, ENERCON
Casey McCurrin	Electrical Design Engineering, ENERCON
Bill Campbell	Electrical Design Engineering, ENERCON
John Baquet	Mechanical Design Engineering, ENERCON
Jamie Praser	Mechanical Design Engineering, ENERCON

Documents Reviewed

- EC 50275, FLEX Basis Engineering Change, Rev. 2
- EC 50277, FLEX Piping Modifications
- EC 50278, Pre-Outage/ On-Line Piping Work
- EC 50279, Connection to Standby Service Water System
- EC 50280, RCIC Suction From Upper Containment Pool
- EC 50281, LPCS and RHR "C" Connection for FLEX Pump
- EC 50282, FLEX Containment Cooling System Vent Path
- EC 50283, FLEX Electrical Modifications
- EC 50284, FLEX Div I Electrical
- EC 50285, FLEX Div II Electrical
- EC 50286, GGNS Spent Fuel Pool Level Instrumentation Upgrade," Revision 0
- EC 50287, FLEX Equipment Storage Buildings
- EC 50289, FLEX Upper Containment Pool Drain Valve Modifications
- EC 50711, EP Communications
- EC 58149, Portable Instrumentation
- MC-Q1111-14001 (EC50275-RCIC Pump NPSH)
- MC-Q1111-14003 (EC50275-BDBEE Water Requirements)
- MC-Q1111-14007 (EC50275-FLEX Phase 2 Pump BDBEE NPSH)
- MC-Q1111-14008 (EC50275-BDBEE FLEX Phase 2 Pump)
- MC-Q1111-14010 (EC50275-BDBEE Recovery Phase 3 Pump)
- EC-Q1111-14001 (EC50275-BDBEE Battery Discharge Capacity), Rev. 1
- EC-Q1111-14002 (EC50275-BDBEE Phase 2 and Recovery Phase 3 Portable Diesel Generators)
- EC-N1111-14001 (EC50275-BDBEE Phase 2 Diesel Generator Protective Device Settings), Rev. 1
- XC-Q1111-14001 (EC50275-BDBEE Control Room Ventilation)
- XC-Q1111-14003 (EC50275-BDBEE RCIC Room Ventilation)
- XC-Q1111-14005 (EC50275-BDBEE Core and Containment Analysis for FLEX Strategy)
- CC-Q1M10-14001 (EC50275-BDBEE Containment Wall Evaluation)
- GOTHIC calculation, MC-QSZ77-09004, "Alternate Ventilation for Safeguard Switchgear and Battery Rooms."
- E0046, Rev.1: Hydrogen Gas Evolution From Class 1E and Non Class 1E Batteries.
- ENTGGG111-CALC-004, Final Calculation- Station Division 1 Battery 1A3 and Division II Battery 1 B3 Discharge Capacity during ELAP.
- Engineering Report GGNS-SA-14-00002, Rev. 0: Further Development of Grand Gulf FLEX Strategy Analytical Bases and Conceptual Design
- SK-ECN59299-001, Rev. 0: FLEX Phase 2 Diesel Generator One-Line Sketch
- EC Drawing No. 50283: E1020, Rev. 7: One Line Meter & Relay Diagram 480V Buses 15BA6 & 16BB6
- EC Drawing No. 52475: E1020, Rev. 7: One Line Meter & Relay Diagram 480V Buses 15BA6 & 16BB6
- E-0658, "Lighting Panel Schedule," Revision 0

- E-1008, Rev. 21: One Line Meter & Relay Diagram 4.16V KV E.S.F. System Buses 15AA & 16AB Unit 1
- E-1013, "One Line Meter and Relay Diagram 480 Volt Bus 13BD1 and 13BD2," Revision 15
- E-1015, "One Line Meter and Relay Diagram 480 Volt Bus 14BE1 and 14BE2," Revision 15
- E-1023, Rev. 34: One Line Meter & Relay Diagram 125V DC Buses 11DA, 11DB, & 11DC
- E-1026, Rev. 14: One Line Meter and Relay Diagram 120V AC ESF Uninterruptible Power Supplies
- E-1030-019, "240V AC BOP Power Panel 1P199 MCC 13B12," Revision 0
- E-1066-001, "MCC Tabulation 480 V. BOP MCC 13B12 Turbine Building," Revision 24
- E-1076-001, "MCC Tabulation 480 V. BOP MCC 14B21 Turbine Building," Revision 22
- E-1186-46, Rev. 3: E61 Combustible Gas Control System Hydrogen Ignition Controls Unit 1
- GGNS-IC-14-00003, "MOHR EFP-IL SFPI System Test Reports, Qualification Reports, and NAI Calculation," Revision 0.
- Calculation CC-N1G41-14001, "Spent Fuel Pool Probe Mounting Bracket Qualification," Revision 0.
- Calculation 425A.4520, "Spent Fuel Pool Display Panel, Battery Enclosure, and Transformer Mounting Qualification for Channel A," Revision 0
- Calculation 425A.4521, "Spent Fuel Pool Display Panel, Battery Enclosure, and Transformer Mounting Qualification for Channel B," Revision 0.
- Calculation XC-N1FLEX-14002, "Spent Fuel Pool Instrumentation Shielding Calculation," Revision 0.
- E-0690, "Raceway Plan Control Bldg. Elev. 148'-0" Area 25A," Revision 42
- E-1681, "Raceway Plan Aux. Bldg. Elev. 139'-0" Area 8 Unit 1," Revision 47
- E-1685, "Raceway Plan Aux. Bldg. Elev. 166'-0" and 170'- 0" Area 8 Unit 1," Revision 37
- E-1689, "Raceway Plan Aux. Bldg. Elev. 185'-0" Area 10 Unit 1," Revision 20
- E-1690, "Raceway Plan Aux. Bldg. Elev. 208'-10" Area 9 Unit 1," Revision 25
- E-1691, "Raceway Plan Aux. Bldg. Elev. 208'-10" Area 10 Unit 1," Revision 27
- 05-1-02-I-4, Off-Normal Event Procedure (ONEP), Loss of AC Power, Rev. 47
- 05-1-02-I-7, Off-Normal Event Procedure (ONEP), Extended Loss of AC Power (ELAP), Draft
- 05-S-01-FSG-001, Long Term Reactor Vessel Cooling, Draft.
- 05-S-01-FSG-002, Alternate RCIC Suction Source, Draft.
- 05-S-01-FSG-003, Alternate Reactor Vessel Cooling, Draft.
- 05-S-01-FSG-004, ELAP DC Bus Load Shed and Management, Draft.
- 05-S-01-FSG-005, Initial Assessment and FLEX Equipment Staging, Draft.
- 05-S-01-FSG-007, Loss of Control/Instrumentation Power, Draft.
- 05-S-01-FSG-011, Alternate Spent Fuel Pool Makeup and Cooling, Draft.
- 05-S-01-FSG-012, Alternate Containment Cooling and Hydrogen Control, Draft.
- 05-S-01-FSG-013, Transition From FLEX Equipment, Draft.
- 05-S-01-FSG-100, Beyond Design Bases External Event (BDBEE) with an Extended Loss of Offsite and Onsite Power (ELAP) Emergency Response, Draft.

- 05-S-01-FSG-101, Emergency Communications For Beyond Design Basis External Events, Draft.
- AREVA Document No. 38-9246940-000, "Grand Gulf Nuclear Station SAFER Response Plan", GGNS-SA-15-00001, Revision 1, dated September 8, 2015.
- EN-OU-108, Shutdown Safety Management Program (SSMP), Revision 8

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

Audit Item Reference	Item Description	Licensee Input Needed
ISE CI 3.1.1.1.A	<p>The NRC staff noted that the two FSBs are designed to the ASCE 7-10 standard with a design seismic acceleration level of .059g, while the site's current licensing basis for the safe shutdown earthquake is a seismic acceleration level of 0.15g. This does not meet the definition of a robust structure as defined on p. A-2 of NEI 12-06, Rev. 0, nor does it conform to the protection level stated in section 5.3.1.2 of NEI 12-06.</p>	<p>The NRC staff notes that the licensee stated that the seismic criteria was not the limiting criteria in the building design. The staff requests that the licensee make available for audit an analysis of the ability of the FSBs to survive a safe shutdown earthquake, or the ground motion response spectrum from the Grand Gulf seismic hazard and screening report dated March 31, 2014.</p>
SFPI RAI 23-D	<p>During the onsite audit, the NRC staff noted that the metal conduits for the two SFP level channels were routed within 3 feet of each other (and sometimes less than that) on the north and west walls of the SFP operating floor in the auxiliary building. This does not appear to meet the requirements of Order EA-12-051 that:</p> <p>“The spent fuel pool level instrument channels shall be arranged in a manner that provides reasonable protection of the level indication function against missiles that may result from damage to the structure over the spent fuel pool. This protection may be provided by locating the primary instrument channel and fixed portions of the backup instrument channel, if applicable, to maintain instrument channel separation within the spent fuel pool area, and to utilize inherent shielding from missiles provided by existing recesses and corners in the spent fuel pool structure.”</p>	<p>The NRC staff has reviewed the licensee's rationale for this design and has determined that the licensee should provide additional protection for at least one of the conduits, or provide additional separation of the conduits.</p>

If you have any questions, please contact me at 301-415-2901 or by e-mail at John.Boska@nrc.gov.

Sincerely,

/RA/

John P. Boska, Senior Project Manager
Orders Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure:
Audit report

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RidsRgn4MailCenter
JBoska,
MHalter
AProffitt
LGibson

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