



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

June 18, 2015

Mr. Joseph E. Pacher  
Vice President  
R.E. Ginna Nuclear Power Plant  
R.E. Ginna Nuclear Power Plant, LLC  
Exelon Generation Company, LLC  
1503 Lake Road  
Ontario, NY 14519

SUBJECT: R. E. GINNA NUCLEAR POWER PLANT - 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. MF1152 AND MF1147)

Dear Mr. Pacher:

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 March 8, 2013 (ADAMS Accession No. ML13074A056), Constellation Energy Group, LLC, acting for R. E. Ginna Nuclear Power Plant, LLC (the licensee), submitted its OIP for R. E. Ginna Nuclear Power Plant (Ginna) in response to Order EA-12-049. Subsequently, Exelon Generation Company, LLC (the licensee or Exelon) purchased Ginna, and is now licensed as the operating authority in conjunction with R.E. Ginna Nuclear Power Plant, LLC. By letters dated August 27, 2013, February 27, 2014, August 26, 2014, and February 20, 2015 (ADAMS Accession Nos. ML13254A278, ML14069A318, ML14245A051, and ML15057A044, respectively), the licensee 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 Ginna interim staff evaluation (ISE) dated February 19, 2014 (ADAMS Accession No. ML14007A704), and continues with in-office and onsite portions of this audit.

By letter dated February 28, 2013 (ADAMS Accession No. ML13066A172), the licensee submitted its OIP for Ginna in response to Order EA-12-051. By letter dated August 29, 2013 (ADAMS Accession No. ML13226A382), the NRC staff sent requests for additional information (RAIs) to the licensee. By letters dated September 23, 2013, August 27, 2013, February 24, 2014, August 26, 2014, and February 20, 2015 (ADAMS Accession Nos. ML13269A011,

ML13254A279, ML14069A180, ML14241A015, and ML15056A696, 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 Ginna ISE and RAI dated December 5, 2013 (ADAMS Accession No. ML13337A625). 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 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 will occur prior to declarations of compliance for Ginna.

In support of the ongoing audit of the licensee's OIPs, as supplemented, the NRC staff conducted an onsite audit at Ginna from May 4-7, 2015, per the audit plan dated March 31, 2015 (ADAMS Accession No. ML15082A131). 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.

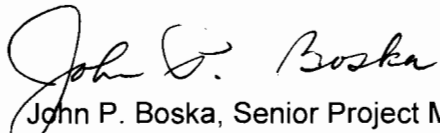
The enclosed audit report provides a summary of the activities for the onsite audit portion. Additionally, this report contains an attachment listing all open audit items currently under NRC staff review.

J. Pacher

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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, reading "John P. Boska". The signature is fluid and cursive, with the first name "John" and last name "Boska" clearly legible.

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

Docket No.: 50-244

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  
EXELON GENERATION COMPANY, LLC  
R. E. GINNA NUCLEAR POWER PLANT  
DOCKET NO. 50-244

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 March 8, 2013 (ADAMS Accession No. ML13074A056), Constellation Energy Group, LLC, acting for R. E. Ginna Nuclear Power Plant, LLC (the licensee), submitted its OIP for R. E. Ginna Nuclear Power Plant (Ginna) in response to Order EA-12-049. Subsequently, Exelon Generation Company, LLC (the licensee or Exelon) purchased Ginna, and is now licensed as the operating authority in conjunction with R.E. Ginna Nuclear Power Plant, LLC. By letters dated August 27, 2013, February 27, 2014, August 26, 2014, and February 20, 2015 (ADAMS Accession Nos. ML13254A278, ML14069A318, ML14245A051, and ML15057A044, respectively), the licensee submitted its first four six-month updates to the OIP. By letter dated

Enclosure

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By letter dated February 28, 2013 (ADAMS Accession No. ML13066A172), the licensee submitted its OIP for Ginna in response to Order EA-12-051. By letter dated August 29, 2013 (ADAMS Accession No. ML13226A382), the NRC staff sent requests for additional information (RAIs) to the licensee. By letters dated September 23, 2013, August 27, 2013, February 24, 2014, August 26, 2014, and February 20, 2015 (ADAMS Accession Nos. ML13269A011, ML13254A279, ML14069A180, ML14241A015, and ML15056A696, 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 Ginna ISE and RAI dated December 5, 2013 (ADAMS Accession No. ML13337A625). 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 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 Ginna from May 4-7, 2015, per the audit plan dated March 31, 2015 (ADAMS Accession No. ML15082A131). 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.

Following the licensee's declarations of order compliance, the NRC staff will evaluate the OIPs, as supplemented; the resulting site-specific Overall Program Documents (OPDs) and Final Integrated Plans (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 using the Nuclear Energy Institute (NEI) developed 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). For Order EA-12-051, the

staff will make a safety determination using the NEI developed 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 for compliance, additional staff review will be required to evaluate the alternative strategy in reference to the applicable order.

## AUDIT ACTIVITIES

The onsite audit was conducted at the Ginna facility from May 4, 2015, through May 7, 2015. The NRC audit team staff was as follows:

<b>Title</b>	<b>Team Member</b>	<b>Organization</b>
Team Lead/Project Manager	John Boska	NRR/JLD
Technical Support – Electrical	Kerby Scales	NRR/JLD
Technical Support – Reactor Systems	Joshua Miller	NRR/DSS
Technical Support – Reactor Systems	Austin Roberts	NRR/JLD
Technical Support – Balance of Plant	On Yee	NRR/JLD
Technical Support - SFPI	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 (May 4, 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 a BDBEE, 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 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. Results of these technical reviews and 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 coolant pump (RCP) seals, the use of the two standby auxiliary feedwater (SAFW) pumps to maintain level in the steam generators (SGs) for reactor decay heat removal using a water supply from the SAFW deionized water storage tank (DWST), and the addition of water to the reactor coolant system (RCS) using the FLEX RCS pump located in the SAFW building. A portable FLEX SG makeup pump will also be stored in the SAFW annex building. A portable FLEX RCS makeup pump will be stored in the L building. 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 (such as Lake Ontario), 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 FLEX electrical generators. In order to provide electrical power, the primary 480 volt (480 V) air-cooled FLEX generator is permanently installed in the SAFW annex building, and is used to power the SAFW pumps and other equipment. The SAFW annex building was added for FLEX response adjacent to the SAFW building, with plans for a doorway to connect the two buildings. The primary FLEX diesel generator (DG) (one megawatt, 480 V) has enough diesel fuel for several hours of operation, and will be refueled after that. The backup (N+1) FLEX generator (100 kilowatt) will be stored in the L building, which is not fully robust considering the BDBEE hazards. The staff reviewed the licensee's load and sizing calculations for the FLEX generators and did not identify any issues.

### 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. The NRC staff also reviewed the available 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 where the FLEX equipment would be located or stored (for portable equipment). The staff walked down equipment haul routes from the storage locations 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, SFP inventory, and containment cooling functions. This included the usage of the portable FLEX pumps, hose routing and 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 licensee's cooldown strategy relies on operation of the SG atmospheric dump valves (ADV's). The NRC staff reviewed the capability to operate the ADV's during an extended loss of alternating current (ac) power (ELAP).
- e. The NRC staff reviewed the licensee's plans to ensure adequate communications, lighting, personnel access, and equipment access, to successfully implement the strategies. The staff interviewed plant personnel responsible for these areas, and observed lighting and communication needs during plant walkdowns.

### 4.0 Exit Meeting (May 7, 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 were 14 FLEX issues and no SFPI issues 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 March 31, 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 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. 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

Austin Roberts	NRR/JLD/JERB
Khoi Nguyen	NRR/JLD/JERB
On Yee	NRR/JLD/JCBB

#### Ginna Staff:

George Wrobel	Fukushima Project Manager
Chris Bradshaw	Regulatory Affairs
Edward Groh	Fukushima Project
Doug Gomez	Fukushima Project
Matt Zweigle	Fukushima Project
John Traynor	Fukushima Project
Chris Downs	Engineering
Erik Durkish	Engineering
Dale Bisaillon	Fukushima Project
Robert Cavalier	Fukushima Project
J. Adams	Engineering
Patrick Shipp	Engineering
Barry Thurston	Corporate Engineering

## Documents Reviewed

- EP-3-P-0504, Rev. 01501: Electrical/I&C Analyses Impact Form and Load Growth Control Program (EDOC-MISC-2013-0044 274 000)
- RWA-1316-001, "FLEX Intermediate Building GOTHIC Heat Up Analysis," Rev. 0
- RWA-1323-003, Ginna RELAP5 ELAP Analysis for Mode 1," Rev 0.
- RWA-1403-001, "GOTHIC FLEX Containment Analysis," Rev. 0
- RWA-1433-001, "Ginna Standby Auxiliary Feedwater Room Heat-Up Analysis," Rev. 0
- CALC-2013-0001, "Ginna Spent Fuel Pool Area Dose Rates at Severely Reduced Water Levels," Rev. 0
- CALC-2014-0002, "Cycle 38 Reactor Engineering Calculations"
- CALC-2014-0006, "Auxiliary Building Environmental Conditions During ELAP," Rev. 0
- 13Q4212-RPT-001, "Ginna Nuclear Power Plant – Liquefaction Evaluation and Slope Stability Analysis," Rev 000
- 13Q4212-CAL-001, "Ginna Nuclear Power Plant – Liquefaction Evaluation and Slope Stability – Liquefaction Evaluation Near Slope Northwest of Turbine Building, Rev.000
- 13Q4212-CAL-002, "Ginna Nuclear Power Plant – Liquefaction Evaluation and Slope Stability – Stability of Slope Northwest of Turbine Building," Rev.000
- 13Q4212-CAL-003, "Ginna Nuclear Power Plant – Liquefaction Evaluation and Slope Stability – Liquefaction Evaluation Near Slope East of Screenhouse," Rev.000
- 13Q4212-CAL-004, "Ginna Nuclear Power Plant – Liquefaction Evaluation and Slope Stability – Stability of Slope East of Screenhouse," Rev.000
- DA-EE-97-069, "Sizing of Vital Batteries A and B," Rev. 6
- DA-EE-99-047, "125 VDC System Loads and Voltages," Rev. 1
- DA-EE-99-068, "Vital Battery Room Hydrogen Analysis," Rev. 3
- DA-EE-2001-028, "Vital Battery 8 Hour Capacity," Rev. 1
- DA-ME-99-033, "Vital Battery Temperatures During Station Blackout Event," Rev. 0
- DA-ME-13-015, " Seismic Evaluation for SFP Level Indication Radar System Guide Pipe and Supports," Rev.0
- DA-ME-14-003, "FLEX Fuel Consumption Analysis," Rev 1
- DA-ME-14-005, "Reasonable Protection Evaluation Of Offsite Fuel Storage Tanks," Rev. 0
- DA-ME-14-020, "Deionized Water Tank Inventory Requirements," Rev. 0.
- DA-ME-15-005, "FLEX RHR/CCW/SW Hydraulic Model," Rev. 0
- DA-ME-15-006, "Fukushima Timeline Analysis," Rev. 1 (Draft)
- ADC-14-000599-CN-001, "SAFW Pump Flow"
- ECP-11-000104-015-7-01, "Design Change Technical Evaluation for Diesel Driven Standby Aux Feedwater Project - De-Ionized Water Tank Installation," Rev. 2
- ECP-11-000104-015-7B-01, "Design Change Technical Evaluation for Diesel Driven Standby Aux Feedwater Project – De-Ionized Water Tank Criteria," Rev. 2
- ECP-12-000459, "FLEX Generator Installation in SAFW Annex"
- ECP-13-000421, "DDSAFW Project - Standby Auxiliary Feedwater Building Annex"
- ECP-13-000424, "DDSAFW Project - Piping Design and Installation"
- ECP-13-000483, "FLEX Connection on SAFW Discharge"

- ECP-13-000547, "Spent Fuel Pool Level Instruments," Rev. 1
- ECP-13-000975-015-7B-01, "Mechanical and Structural Design Input SAFW Annex"
- ECP-14-000169-015-7B-01, "Alternate Charging System"
- ECP-14-000727, "Intermediate Building Block Wall Reinforcement"
- ECP-14-000749-CN-001, "SAFW Cross Connect Modification," Rev. 0
- GNP011-C-2, "Standby Auxiliary Feedwater Annex Design"
- RE-103, "Control of Reload Core Design"
- 109682-M-021, "Spent Fuel Pool Cooling System EPU Evaluation," Rev. 0
- 12574-1, "Analysis of Tornado Generated Missiles Impacting a Water Storage Tank," Rev. 2
- 13318-2, "Missile Impact Evaluation of Ginna Refueling Water Storage Tank," Rev. 2
- 175180-000-SP-CL-00001, "Design Calculation for 36' diameter X 34'-9" High DRT [Deionized Reserve Tank]," Rev 1.
- 03200-0102, "AC Power Distribution Panels One-Line Diagram," Rev.33
- 11302-0458/9, "Instrument Loop Drawing – Spent Fuel Pool Level"
- 33013-1238, "Standby Auxiliary Feedwater," Rev. July 2014
- 33013-2539, "AC System Plant Load Distribution One Line Wiring Diagram," Rev.28
- 33013-2539-1-BD: "AC System Plant Load Distribution Beyond Design Basis One Line Wiring Diagram"
- 33013-2722, "Residential AC Power Distribution Circuit One-Line Diagram," Sheet 1, Rev.38
- 33013-2722, "Residential AC Power Distribution Circuit One-Line Diagram," Sheet 4, Rev.16
- 33013-2918, Sheet 1 through 9 – "Intermediate Building Block Wall Reinforcement"
- 33013-3131, "1-1-BD: 480 Single-Line Diagram Beyond Design Basis Flowpath"
- 33013-3131, "2-1-BD: 480 Single-Line Diagram Beyond Design Basis Flowpath"
- 33013-3131, "3-1-BD: 480 Single Line Diagram Beyond Design Basis Flowpath"
- 33013-3131, "4-1-BD: 480 Single Line Diagram Beyond Design Basis Flowpath"
- 33013-3131, "5-1-BD: 480 Single Line Diagram Beyond Design Basis Flowpath"
- 33013-3131, "6-1-BD: 480 Single Line Diagram Beyond Design Basis Flowpath"
- 33013-3131, "7-1-BD: 480 Single Line Diagram Beyond Design Basis Flowpath"
- 33013-3160 Sheet 1, "SAFW Annex Building Access Door"
- 03202-0102, 125 VDC Power Distribution System, Rev. 22
- CC-AA-118, "Site Implementation of Diverse and Flexible Coping Strategies (FLEX) and Spent Fuel Pool Instrumentation Program," Exelon Corporate Document
- CC-GI-118, "Site Implementation of Diverse and Flexible Coping Strategies (FLEX) and Spent Fuel Pool Instrumentation Program," (Draft)
- A-52.12, "Nonfunctional Equipment Important to Safety" (Draft)
- CH-S-BULK-FO, "Sampling Off-Site Diesel Fuel Oil Bulk Storage Tanks," Rev. 00500
- CH-240, "Sampling Handling and Evaluation of On-Site Diesel Fuel Oil Storage Tanks," Rev. 0200
- ECA-0.0, "Loss of All AC Power" (Draft)
- EOP ATT-5.5, "Attachment SAFW with Suction from DI Water Storage Tank During SBO" (Draft)
- EOP ATT-8.0, "Attachment DC Loads"

- FSG 1, "Long Term RCS Inventory Control" (Draft)
- FSG 2, "Alternate SAFW Suction Source" (Draft)
- FSG 3, "Alternate Low Pressure Feedwater" (Draft)
- FSG 4, "ELAP DC Bus Load Shed/Management" (Draft)
- FSG 5, "Initial Assessment and FLEX Equipment Staging" (Draft)
- FSG 6, "Alternate SAFW DI Water Storage Tank Makeup" (Draft)
- FSG 7, "Loss of Vital Instrumentation or Control Power" (Draft)
- FSG 8, "Alternate RCS Injection" (Draft)
- FSG 9, "Low Decay Heat Temperature Control" (Draft)
- FSG 10, "Passive RCS Injection Isolation" (Draft)
- FSG 11, "Alternate SFP Makeup and Cooling" (Draft)
- FSG 12, "Alternate Containment Cooling" (Draft)
- FSG 13, "Transition From FLEX Equipment" (Draft)
- FSG 14, "Shutdown RCS Makeup," (Draft)
- Technical Procedure ER-SC.2, "High Water (Flood) Plan," Rev. 01001
- SC-3.17, "Auxiliary Building Flood Barrier Installation/Removal/Inspection," Rev. 00301
- Factory Acceptance Test Report 66-9218244, "Through Air Radar Spent Fuel Pool Level Indication (SFPLI) Instrument Factory Acceptance Test (FAT) Report," Rev. 000
- Site Acceptance Test Report 66-9221608, "Spent Fuel Pool Level Indication Site Acceptance Test Report," Rev. 002
- CPI-LVL-310, "Calibration of SFP Level Northeast Channel Loop LT-310"
- CPI-LVL-311, "Calibration of SFP Level Southeast Channel Loop LT-311"
- Preventive Maintenance P105831 and P105832, "SFP Level Channels"
- Procedure O-6.1, "Equipment Operator Rounds and Log Sheets"
- OU-AA-103, "Shutdown Safety Management Program," Rev. 15

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

**Audit Items Currently Under NRC Staff Review, Requiring Licensee Input As Noted**

<b>Audit Item Reference</b>	<b>Item Description</b>	<b>Licensee Input Needed</b>
ISE CI 3.2.1.B	Consider the prioritization of staging portable equipment that may be required to isolate/vent the accumulators when certain cooldown maneuvers are necessary. The licensee's plan was to enter containment and locally close the accumulator isolation valves. The NRC staff asked for an alternate plan in case the containment building had an adverse environment.	The staff requests that the licensee make available for audit their plan to isolate or vent the RCS cold leg accumulators to avoid injecting nitrogen into the RCS.
ISE CI 3.2.1.2.B	Confirm that the RCP seal O-rings will maintain their integrity at the temperature conditions experienced during the ELAP event, and that the RCP seal leakage rate used in the ELAP analysis is adequate and acceptable.	The staff requests that the licensee make available for audit a list of where the B type O-rings are located and an evaluation of the impact of high temperatures on those O-rings.
ISE CI 3.2.4.8.A	Confirm that the final electrical design has the necessary electrical isolations and protections. The NRC staff determined that the auto start feature of the 1 MW FLEX DG in the SAFW Annex, which automatically energizes the bus, is an alternative to NEI 12-06, as is the use of a permanently installed FLEX DG. The staff accepted the permanent DG in the ISE review, but was unaware of the auto start feature at that time. Also, the staff needs to evaluate the connection points for the 4160V FLEX DG from the NSRC.	The staff requests that the licensee make available for audit the reasons why an auto start and load feature could be an acceptable alternative to NEI 12-06, and provide a list of connection points for the 4160V FLEX DG.

Audit Item Reference	Item Description	Licensee Input Needed
ISE CI 3.3.1.A	Confirm sufficient quantities of FLEX equipment to meet N+1, and identify their storage locations.	The staff requests that the licensee make available for audit the location where each piece of FLEX equipment will be stored and the associated protection from external events at these storage locations.
AQ 1-B	Provide information to demonstrate conformance to the storage guidance of NEI 12-06 for FLEX equipment, especially Section 7.3.1, or justify an alternative to NEI 12-06. The licensee's plan is to store N+1 equipment in a commercial building which is not fully robust.	The staff requests that the licensee make available for audit a justification for using an alternative to the guidance of NEI 12-06. This configuration is a design that is used at most Exelon plants. The NRC staff previously discussed this with Exelon following the NRC FLEX audit at Byron Station. The NRC is pursuing a resolution with the licensee.
SE 1-E	The final validation and verification and timeline checks of procedures and operator actions during an ELAP need to be performed when procedures are completed. The staff is especially concerned with the timeline for initiating feedwater to the SGs.	The staff requests that the licensee make available for audit the validation and verification of the procedures and timeline that shows the actions for an ELAP can be completed as planned.
SE 7-E	In planning operator actions for ELAP, the licensee relies on an analysis of plant response using the modeling code RELAP5/MOD3.3. The NRC staff needs to evaluate the results obtained by the licensee.	No input is needed at this time. The NRC staff will evaluate the licensee's results.
SE 11-E	Discuss all areas where local manual actions are performed and evaluate the ability to perform these tasks based on local conditions such as heat, cold, humidity, radiation, lighting, and communications.	The NRC staff requests that the licensee make available for audit a list of all local manual actions and evaluate if the conditions allow for the task to be accomplished in accordance with the event timeline.
SE 12-E	Discuss strategies involving RCS makeup and boration to verify shutdown margin is maintained and methods of venting the RCS to permit injection flow.	The NRC staff requests that the licensee make available for audit an evaluation of shutdown margin and the ability to inject borated water into the RCS without taking the pressurizer solid.

Audit Item Reference	Item Description	Licensee Input Needed
SE 13-E	Provide justification for the ability of the RCP seals to limit the leakage from the RCS during ELAP conditions to the leakage values assumed in the plant analyses.	The staff acknowledges that this is applicable to all pressurized-water reactors with standard Westinghouse RCP seals. The staff has pursued this with the Pressurized-Water Reactor Owners Group without reaching a resolution. The NRC staff requests that the licensee make available for audit an evaluation of compensatory margins in the analysis that could compensate in the event that RCP seal leakage is greater than assumed in the analysis.
SE 14-E	Determine if all components in the RCP seal leakoff line that function to limit seal leakage flow are capable of withstanding the pressure predicted during an ELAP event, or evaluate the new leakage flow that would result from a failure of the seal leakoff line.	No input is needed at this time. The NRC staff will evaluate the licensee's response.
SE 16-E	Provide the plan for maintenance and testing of FLEX equipment which conforms to the guidance of NEI 12-06, Section 11.5.	The NRC staff understands that Exelon is preparing a corporate response to this issue. Please provide the corporate response, and any specific maintenance and testing requirements for your specific FLEX equipment.
SE 17-E	RCS injection does not have primary and alternate injection points as specified by NEI 12-06, Section 3.2.2 and Table D-1.	The NRC staff requests that the licensee make available for audit a strategy for RCS injection that conforms to NEI 12-06, or provides justification for an alternative to NEI 12-06.
SE 18-E	The portable FLEX SG injection pump does not have primary and alternate injection points to the SGs as specified by NEI 12-06, Section 3.2.2 and Table D-1.	The NRC staff requests that the licensee make available for audit a strategy for SG injection that conforms to NEI 12-06, or provides justification for an alternative to NEI 12-06.



J. Pacher

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

Sincerely,

**/RA/**

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Docket No.: 50-244

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