



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

October 16, 2014

Mr. Mano Nazar  
Executive Vice President  
and Chief Nuclear Officer  
Florida Power and Light Company  
P.O. Box 14000  
700 Universe Boulevard  
Juno Beach, FL 33408-0420

SUBJECT: ST. LUCIE PLANT, UNITS 1 AND 2 - PLAN FOR THE ONSITE AUDIT  
REGARDING IMPLEMENTATION OF MITIGATING STRATEGIES AND  
RELIABLE SPENT FUEL INSTRUMENTATION RELATED TO ORDERS EA-12-  
049 AND EA-12-051 (TAC NOS. MF0984, MF0985, MF0990, AND MF0991)

Dear Mr. Nazar

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. ML13063A020), Florida Power and Light (FPL, the licensee) submitted its OIP for St. Lucie Plant, Units 1 and 2 (St. Lucie), in response to Order EA-12-049. By letters dated August 28, 2013, February 26, and August, 27, 2014 (ADAMS Accession Nos. ML13242A274, ML14064A192, and ML14253A184, respectively), the licensee submitted its first three 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 St. Lucie interim staff evaluation (ISE) and audit report (ADAMS Accession No. ML14002A124) and continues with in-office and onsite portions of this audit.

By letter dated February 28, 2013 (ADAMS Accession No. ML13063A026), the licensee submitted its OIP for St. Lucie in response to Order EA-12-051. By letter dated July 16, 2013 (ADAMS Accession No. ML13196A079), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated July 26, 2013, August 27, 2013, February 28, 2014 and August 27, 2014 (ADAMS Accession Nos. ML13219A838, ML13242A006, ML14064A193, and ML14253A185, respectively), the licensee submitted its RAI responses and first three six-month updates to the OIP.

The NRC staff's review to date led to the issuance of the St. Lucie ISE and RAI dated November 19, 2013 (ADAMS Accession No. ML13274A473). 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 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 the first unit at each site.

This document outlines the on-site audit process that occurs after ISE issuance as licensees provide new or updated information via periodic updates, update audit information on e-portals, provide preliminary Overall Program Documents/Final Integrated Plans, and continue in-office audit communications with staff while proceeding towards compliance with the orders.

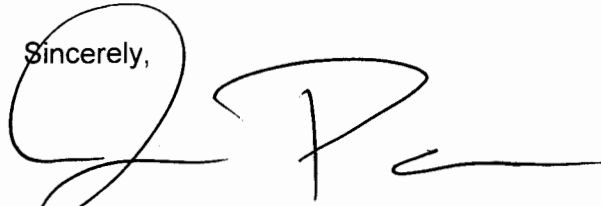
The staff plans to conduct an onsite audit at St. Lucie in accordance with the enclosed audit plan from November 17-21, 2014.

M. Nazar

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If you have any questions, please contact me at 301-415-5888 or by e-mail at Jason.Paige@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to be 'JP', written over a horizontal line.

Jason Paige, Project Manager  
Orders Management Branch  
Japan Lessons-Learned Division  
Office of Nuclear Reactor Regulation

Docket Nos.: 50-335 and 50-389

Enclosure:  
Audit plan

cc w/encl: Distribution via Listserv

**Audit Plan  
St. Lucie Plant, Units 1 and 2**

**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. ML13063A020), Florida Power and Light (FPL, the licensee) submitted its OIP for St. Lucie Plant, Units 1 and 2 (St. Lucie, PSL), in response to Order EA-12-049. By letters dated August 28, 2013, February 26, 2014 and August, 27, 2014 (ADAMS Accession Nos. ML13242A274, ML14064A192, and ML14253A184, respectively), the licensee submitted its first three 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 St. Lucie interim staff evaluation (ISE) and audit report (ADAMS Accession No. ML14002A124) and continues with in-office and onsite portions of this audit.

By letter dated February 28, 2013 (ADAMS Accession No. ML13063A026), the licensee submitted its OIP for St. Lucie in response to Order EA-12-051. By letter dated July 16, 2013 (ADAMS Accession No. ML13196A079), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated July 26, 2013, August 27, 2013, February 28, 2014 and August 27, 2014 (ADAMS Accession Nos. ML13219A838, ML13242A006, ML14064A193, and ML14253A185, respectively), the licensee submitted its RAI responses and first three six-month updates to the OIP. The NRC staff's review to date led to the issuance of the St. Lucie ISE and RAI dated November 19, 2013 (ADAMS Accession No. ML13274A473). 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.

Enclosure

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 the first unit at each site.

This document outlines the onsite audit process that occurs after ISE issuance as licensees provide new or updated information via periodic updates, update audit information on e-portals, provide preliminary Overall Program Documents (OPDs)/Final Integrated Plans (FIPs), and continue in-office audit communications with staff while proceeding towards compliance with the orders.

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

As discussed, onsite audits will be performed per NRR Office Instruction LIC-111, "Regulatory Audits," to support the development of safety evaluations. Site-specific OIPs and OPDs/FIPs rely on equipment and procedures that apply to all units at a site, therefore, audits will be planned to support the "first unit at each site." On-site audits for subsequent units at a site will be on an as-needed basis.

The purpose of the audits is to obtain and review information responsive to the St. Lucie OIPs, as supplemented, open and confirmatory items from the mitigation strategies ISE, RAI responses from the SFPI ISE, and to observe and gain a better understanding of the basis for the site's overall programs to ensure the licensee is on the correct path for compliance with the Mitigation Strategies and SFPI orders. These may include, but are not limited to:

- Onsite review and discussion for the basis and approach for detailed analysis and calculations (Orders EA-12-049, EA-12-051);
- Walk-throughs of strategies and laydown of equipment to assess feasibility, timing, and effectiveness of a given mitigating strategy or integration of several strategies (Order EA-12-049);
- Storage, protection, access, and deployment feasibility and practicality for onsite portable equipment (Order EA-12-049);
- Evaluation of staging, access, and deployment of offsite resources to include Regional Response Center (RRC) provided equipment (Order EA-12-049); and
- Review dimensions and sizing of the SFP area, placement of the SFP level instrumentation, and applicable mounting methods and design criteria (Order EA-12-051).

**NRC AUDIT TEAM**

<b>Title</b>	<b>Team Member</b>
Team Lead/Project Manager	Jason Paige
Technical Support	Garry Armstrong
Technical Support	Matthew McConnell
Technical Support	Stephen Wyman
Technical Support	Reed Anzalone

**NRC AUDIT TEAM – SUPPLEMENTAL MEMBERS**

<b>Title</b>	<b>Team Member</b>
Branch Chief (A)	Carla Roque-Cruz
Branch Chief	Stewart Bailey

**LOGISTICS**

The audit will be conducted onsite at St. Lucie on November 17-21, 2014. Entrance and exit briefings will be held with the licensee at the beginning and end of the audit, respectively, as well as daily briefings of team activities. Additional details will be addressed over the phone. A more detailed schedule is provided below.

A private conference room is requested for NRC audit team use with access to audit documentation upon arrival and as needed.

## DELIVERABLES

An audit report/summary will be issued to the licensee within 45 days from the end of the audit.

## INFORMATION NEEDS

- Materials/documentation provided in responses to open or confirmatory items and RAIs in the ISEs;
- OPD/FIP (current version), operator procedures, FLEX Support Guidelines (FSGs), operator training plans, RRC (SAFER) St. Lucie Response Plan; and
- Materials/documentation for staff audit questions and/or licensee OIP identified open items as listed in the Part 2 table below

To provide supplemental input to the ongoing audit of documents submitted to the NRC and made available via e-portal, the onsite audit will have three components: 1) a review of the overall mitigating strategies for the site, including, if needed, walk-throughs of strategies and equipment laydown of select portions; 2) a review of material relating to open or confirmatory items and RAIs from the ISEs, staff audit questions, and licensee open items; and 3) additional specific issues requested by NRC technical reviewers related to preparation of a safety evaluation. Each part is described in more detail below:

### Part 1 - Overall Mitigating Strategies and Program Review:

During the onsite audit, please be prepared to conduct a tabletop discussion of the site's integrated mitigating strategies and SFPI compliance program. This discussion should address the individual components of the plans, as well as the integrated implementation of the strategies including a timeline. The licensee team presenting this should include necessary representatives from site management, engineering, training, and operations that were responsible for program development, and will be responsible for training and execution.

Following the tabletop discussion, please be prepared to conduct walk-throughs of procedures and demonstrations of equipment as deemed necessary by NRC audit team members. Include representatives from engineering and operations that will be responsible for training and execution. At this time we expect, at a minimum, to walk-through the items below. Based on the tabletop presentations and audit activities, this list may change.

**WALK-THROUGH LIST:**

1. Walk-through a sample of strategies that will be delineated by specific NRC technical staff audit team members.
2. Walk-through of portable (FLEX) diesel generator (DG) procedures, to include power supply pathways, areas where manual actions are required, and electrical isolation.
3. Walk-through of building access procedures, to include any unique access control devices.
4. Strategy walk-through of transfer routes from staging and storage areas to deployment locations for both onsite and offsite equipment.
5. Strategy walk-through for core cooling and reactor coolant system (RCS) inventory, to include portable pumping equipment, flow paths, and water storage locations and the related reactor systems analysis and calculations.
6. Walk-through of communications enhancements.
7. Walk-through of SFP area, SFP instrumentation locations, and related equipment mounting areas. Assess the potential of electromagnetic interference (EMI).

Part 2 – Specific Technical Review Items:

During the visit, the following audit items will be addressed from the licensee's ISEs open items (OIs), confirmatory items (CIs), and SFPI RAIs; audit question list (AQ); licensee OIP, as supplemented, open items; and draft safety evaluation (SE) additional questions. Please provide documents or demonstrations as needed to respond to each item.

<b>Audit Item Reference</b>	<b>Item Description</b>
ISE OI 3.2.1.8.A	Provide confirmation that St. Lucie will apply the generic resolution for boron mixing under natural circulation conditions potentially involving two-phase flow, in accordance with the conditions provided in the NRC endorsement letter dated January 8, 2014, or alternatively, justify the boric acid mixing assumptions that will ensure adequate shutdown margin exists through all 3 phases of an [Extended loss of alternating current (ac) power] ELAP event.
ISE OI 3.2.1.8.B	The St. Lucie RCS Inventory coping strategy involves an alternate approach relying on repowering one of three installed charging pumps in each unit using a portable 480 VAC FLEX generator. Justify how these installed pumps will be capable of performing their mitigating strategies function following an undefined ELAP event, in contrast to using a portable FLEX pump.



Audit Item Reference	Item Description
ISE CI 3.1.1.2.A	Consistent with Consideration 2 of NEI 12-06, Section 5.3.2, provide confirmation that the routes for deployment of FLEX equipment provide for at least one connection point for the FLEX equipment that will only require access through seismically robust structures.
ISE CI 3.1.1.4.A Licensee OIP Identified Item 3, 4, and 5	Provide a description of the deployment routes and methods to be used to enable delivery of resources from the RRC staging area to the site following a BDBEE.
ISE CI 3.2.1.1.A	The NRC staff endorsed the [Pressurized-Water Reactor Owners Group] PWROG position paper on the use of the Combustion Engineering Nuclear Transient (CENTS) code in the ELAP analysis for Combustion Engineering plants, with the limitation that it can only be applied to the flow conditions prior to reflux boiling initiation. Provide justification that the applicable ELAP analyses for St. Lucie meet the above limitation on the use of CENTS.
ISE CI 3.2.1.2.A ISE CI 3.2.1.2.B	Provide the plant-specific [reactor coolant pump] RCP seal leakage rates assumed for St. Lucie from time zero to the time when sub-cooling in the RCS cold-legs decreases to 50 degrees °F, and justify the impact of these leakage rates on the plant-specific time constraints and sequence of events (SOE).
ISE CI 3.2.1.5.A	Provide confirmation that the Rosemount pressure transmitters credited in an ELAP event will continue to function in the anticipated environmental conditions.
ISE CI 3.2.1.9.A	Justify the use of the NOTRUMP computer code to determine the integrated flow rate required to remove decay heat and sensible heat.
ISE CI 3.2.1.9.B	Provide justification that the revised calculation for RCS makeup flow demonstrates that the FLEX strategies and equipment can provide sufficient flow to accommodate the sensible heat resulting from cooldown in the 2-6 hour time frame.
ISE CI 3.2.1.9.C	Provide justification that the pump criteria and the associated analysis support the adequacy of the RRC-supplied pumps to reestablish Shutdown Cooling for Phase 3.
ISE CI 3.2.4.2.A	Provide a calculation that the electrical equipment room equipment is analyzed for operation up to a temperature of 129 degrees °F for 72 hours, or that portable fans will be used to provide adequate room ventilation.
ISE CI 3.2.4.4.A	The NRC staff has reviewed the licensee communications assessment (ADAMS Accession Nos. ML12307A116 and ML13057A033) and has determined that the assessment for communications is reasonable (ADAMS Accession No. ML13134A050). Provide confirmation that the upgrades to the site's communications systems have been completed.
ISE CI 3.2.4.6.A	Provide justification that the measures to provide main control room ventilation under high ambient temperatures during an ELAP event are sufficient to mitigate room heat-up and allow operators to perform their functions.
ISE CI 3.2.4.7.A AQ 40	Provide confirmation of the availability of secondary sources of water to provide makeup to the condensate storage tanks and refueling water storage tanks during Phase 2 following a high wind missile event.

Audit Item Reference	Item Description
ISE CI 3.2.4.10.A AQ 46	The revised battery load shed strategy is to initially secure one battery, load shed and operate on the other battery, and return the secured battery to service before the first battery is depleted, thereby extending the available coping time. Provide confirmation that this revised strategy is sufficient to power all critical loads during Phase 1, and can be implemented consistent with the assumed time constraints and sequence of events.
ISE CI 3.3.2.A	Provide confirmation that Considerations 1 and 3 of Section 11.8 of NEI 12- 06 will be addressed, so that: 1) a historical record of previous mitigating strategies and the basis for changes will be maintained, and 2) a mitigating strategies change process will be adopted which provides a documented engineering basis that ensures that any change in FLEX strategy continues to ensure the key safety functions are met; or provide an appropriate alternative.
AQ 2	FPL's integrated plan did not address the procedural interfaces considerations for seismic hazards associated with 1) large internal flooding sources that are not seismically robust and do not require ac power, and 2) the use of ac power to mitigate ground water in critical locations as required by NEI 12-06 Section 5.3.3, Considerations 2 and 3. Provide a discussion regarding any large internal flooding sources that are not seismically robust and do not require ac power, and 2) the use of ac power to mitigate ground water in critical locations. If these considerations are not applicable to PSL, then provide a discussion regarding why they are not applicable to PSL.
AQ 3	FPL's integrated plan did not specifically address NEI 12-06 Section 6.2.3.2, Consideration 7 regarding the potential need for dewatering or extraction pumps, and Consideration 8 regarding the potential need for temporary flood barriers. Provide a discussion of these flood mitigation considerations (7 and 8) if they are applicable to PSL or provide a discussion of why these flood mitigation provisions are not needed at PSL.
AQ 4	FPL's integrated plan provided some plans for procedures to be used to deploy portable equipment during flood conditions. For Considerations 1 and 2, of NEI 12-06 section 6.2.3.3 FPL identified several procedures to be developed regarding deployment of FLEX equipment and connection point considerations. Provide a reference to procedures regarding deployment of temporary flood barriers, per Consideration 3 of NEI 12-06 Section 6.2.3.3, or discuss why these procedures are not required at PSL.
AQ 6	If it is intended to credit significant improvement for ELAP related to the isolation of controlled bleed-off (CBO) lines, provide confirmation that CBO isolation procedures, human factors requirements, and equipment qualifications are applicable to the ELAP event and are able to be achieved within the time frames described in section 5.3.1 of WCAP-16175.

Audit Item Reference	Item Description
AQ 14	FPL's strategy for providing air flow to remove steam generated from pool boiling include securing open all Fuel Handling Building (FHB) doors, opening the large L-shaped door (no power required) and staging hoses for portable makeup or spray from the SFP FLEX pump. The open FHB doors will provide a ventilation pathway for steam from the SFP in addition to a pathway for laying hoses. It is not clear from this discussion what the actual flow path of steam and condensate will be since the elevations of the various doors was not discussed. No elevation diagrams were included in the integrated plan. Provide a discussion regarding SFP door location and elevations that details how moisture will be vented from the SFP building if boiling occurs.
AQ 18 AQ 45	NEI 12-06, Section 3.2.2, Paragraph (3) provides that plant procedures/guidance should specify actions necessary to assure that equipment functionality can be maintained (including support systems or alternate method) in an ELAP/[LUHS] or can perform without ac power or normal access to the ultimate heat sink (UHS), such systems as auxiliary building cooling water, service water, or component cooling water cooling when ac power is lost during the ELAP for Phase 1 and 2. For example, the potential need for cooling water for the TDAFW pump bearings was not discussed. Provide additional information regarding plans to provide ventilation and cooling to credited equipment when normal cooling will not be available during the ELAP.
AQ 19 AQ 44	Provide a discussion of battery room ventilation to prevent hydrogen accumulation while recharging the batteries in phase 2 or 3. In your response, include a description of the exhaust path if it is different from the design basis.
AQ 22	NEI 12-06, Section 3.2.2, Paragraph (12) provides that: Plant procedures/guidance should consider loss of heat tracing effects for equipment required to cope with an ELAP. Alternate steps, if needed, should be identified to supplement planned action. Provide a discussion of the need for heat tracing for equipment required to cope with an ELAP.
AQ 23	NEI 12-06, Section 3.2.2, Paragraph (8) provides that: Plant procedures/guidance should identify the portable lighting (e.g., flashlights or headlamps) and communications systems necessary for ingress and egress to plant areas required for deployment of FLEX strategies. On page 80 of 102 of the integrated plan, FPL noted in Figure 3, PSL FLEX Electrical Connections (Phase 1-3 Strategy Table), that emergency lighting and plant communications would be powered from the 480 VAC FLEX portable generators. The sequence of events timetable on page 74, Action Item 5 notes that the 480 VAC generator will be deployed and connected between 6-8 hours into the event. Provide plans for the availability of installed lighting and communications equipment prior to the connection of the 480 VAC portable generators.
AQ 24	NEI 12-06, Section 3.2.2, Paragraph (9) provides that: Plant procedures and guidance should consider the effects of ac power loss on area access, as well as the need to gain entry to the Protected Area and internal locked areas where remote equipment operation is necessary. Provide plans for access to the protected area and internal locked areas of the plant considering loss of power to security systems.

Audit Item Reference	Item Description
AQ 25	Describe how electrical isolation will be maintained such that (a) Class 1E equipment is protected from faults in portable/FLEX equipment and (b) multiple sources do not attempt to power electrical buses.
AQ 28	NEI 12-06, Section 3.2.2, guideline (15) and Section 11.5, specify requirements regarding maintenance, equipment unavailability, and testing. In its integrated plan, FPL described establishing a maintenance program plan based on EPRI guidelines and using existing plant maintenance programs to identify and document maintenance and testing requirements. Please confirm your intention to commit to the generic EPRI industry program for maintenance and testing of FLEX electrical equipment such as batteries, cables, and diesel generators. [See NRC endorsement letter dated October 7, 2013; NRC ADAMS Accession No. ML13276A224]
AQ 31	Identify the installed non-safety related systems or equipment that are credited in establishing the mitigation strategies. For the identified systems or equipment, discuss the intended mitigation functions, and justify that they are available and reliable to provide the desired functions on demand during the ELAP conditions.
AQ 39	Provide a summary of the sizing calculation for the FLEX generators to show that they can supply the loads assumed in phases 2 and 3.
AQ 42	On Page 24 of the Mitigation Plan, under PWR Portable Equipment Phase 2, the licensee described the portable diesel driven pump (SG FLEX pump) being deployed for injection into the steam generators (SGs) in the event that the turbine-driven auxiliary feedwater (TDAFW) pump fails. The licensee indicated that the time and resources to make connections of the SG FLEX pump will be validated. Provide a milestone for completing its validation for connection of the SG FLEX pump for Phase 2 when needed.
AQ 48	Motive Force for the atmospheric dump valve (ADV) Operations: (a) Specify the size of the ADV backup nitrogen supply source and the required time for its use as motive force to operate the ADVs for mitigating an ELAP event; (b) Discuss the analysis determining the size of the subject nitrogen supply to show that the nitrogen sources are available and adequate, lasting for the required time; (c) Discuss the electrical power supply that is required for operators to throttle steam flow through the ADVs within the required time and show that the power is available and adequate for the intended use before the operator takes actions to manually operate the ADVs; and (d) Discuss the operator actions that are required to operate ADVs manually and show that the required actions can be completed within the required time.

Audit Item Reference	Item Description
AQ 49	Uncontrolled Cooldown - Clarify whether the ADVs or upstream associated piping is protected from external events such as tornado missiles. If not, address the following questions: (a) Clarify whether damage to the ADV or upstream associated piping could occur during an ELAP that would result in an uncontrolled cooldown of the reactor coolant system; (b) Clarify whether postulated damage would be limited to a single ADV and/or associated piping, or whether failures could be postulated resulting in an uncontrolled cooldown affecting both steam generators; (c) If ELAP scenarios involving the uncontrolled cooldown of one or more steam generators may be postulated, describe key operator actions that would be taken to mitigate these events; (d) If ELAP scenarios involving the uncontrolled cooldown of one or more steam generators may be postulated, provide an analysis demonstrating that the intended mitigating actions would lead to satisfaction of the requirements of Order EA-12-049 for these cases; and (e) As applicable, if the operator actions to mitigate an ELAP event involving an uncontrolled cooldown results in an asymmetric cooldown of the reactor coolant system, address the consequences of the asymmetric cooldown on the mixing of boric acid that is added to the reactor coolant system to ensure sub-criticality.
AQ 51	Clarify whether you plan to abide by the NEI position paper addressing mitigating strategies in shutdown and refueling modes that is dated September 18, 2013 (ADAMS Accession No. ML13273A514), which has been endorsed by the NRC staff (ADAMS Accession No. ML13267A382). If not, clarify how mitigating strategies for shutdown and refueling modes will be addressed and provide justification for the planned approach.
Licensee OIP Identified Item 15	Provide boron batching alternatives.
Licensee OIP Identified Item 25	Provide the technical basis for WCAP-1760 1-P deviations to NRC during six month updates.
SFPI RAI 2	Provide the following: a) The design criteria that will be used to estimate the total loading on the mounting device(s), including static weight loads and dynamic loads. Describe the methodology that will be used to estimate the total loading, inclusive of design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces; b) A description of the manner in which the level sensor (and stilling well, if appropriate) will be attached to the refueling floor and/or other support structures for each planned point of attachment of the probe assembly. Indicate in a schematic the portions of the level sensor that will serve as points of attachment for mechanical/mounting or electrical connections; and c) A description of the manner by which the mechanical connections will attach the level instrument to permanent SFP structures so as to support the level sensor assembly.
SFPI RAI 3	Provide the results of the analyses used to verify the design criteria and methodology for seismic testing of the SFP instrumentation and the electronics units, including, design-basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces.

Audit Item Reference	Item Description
SFPI RAI 5 SFPI RAI 6	Provide the following: a) A description of the specific method or combination of methods that will be applied to demonstrate the reliability of the permanently installed equipment under [beyond-design-basis] BDB ambient temperature, humidity, shock, vibration, and radiation conditions; b) A description of the testing and/or analyses that will be conducted to provide assurance that the equipment will perform reliably under the worst-case credible design-basis loading at the location where the equipment will be mounted. Include a discussion of this seismic reliability demonstration as it applies to 1) the level sensor mounted in the SFP area, and 2) any control boxes, electronics, or read-out and re-transmitting devices that will be employed to convey the level information from the level sensor to the plant operators or emergency responders; and c) A description of the specific method or combination of methods that will be used to confirm the reliability of the permanently installed equipment such that following a seismic event the instrument will maintain its required accuracy. Provide the results from the selected methods, tests and analyses used to demonstrate the qualification and reliability of the installed equipment in accordance with the Order requirements.
SFPI RAI 7	Provide the NRC staff with the final configuration of the power supply source for each channel, as well as cable and conduit separation, so that the staff may conclude that the two channels are independent from a power supply assignment perspective.
SFPI RAI 11	Provide the following: a) A description of the capability and provisions the proposed level sensing equipment will have to enable periodic testing and calibration, including how this capability enables the equipment to be tested in-situ; b) A description of how such testing and calibration will enable the conduct of regular channel checks of each independent channel against the other, and against any other permanently installed SFP level instrumentation; c) A description of how calibration tests and functional checks will be performed and the frequency at which they will be conducted. Discuss how these surveillances will be incorporated into the plant surveillance program; d) A description of what preventive maintenance tasks are required to be performed during normal operation, and the planned maximum surveillance interval that is necessary to ensure that the channels are fully conditioned to accurately and reliably perform their functions when needed.
SFPI RAI 12	Provide the time available for personnel to access the display as credited in the evaluation, as well as the actual time (e.g., based on walk-throughs) that it will take for personnel to access the display. Additionally, include a description of the radiological and environmental conditions on the paths personnel might take. Describe whether the display location remains habitable for radiological, heat and humidity, and other environmental conditions following a BDB event.
SFPI RAI 13	Provide a list of the procedures addressing operation (both normal and abnormal response), calibration, test, maintenance, and inspection procedures that will be developed for use of the SFP instrumentation. The licensee is requested to include a brief description of the specific technical objectives to be achieved within each procedure.

<b>Audit Item Reference</b>	<b>Item Description</b>
SFPI RAI 14	Provide the following: a) Further information describing the maintenance and testing program the licensee will establish and implement to ensure that regular testing and calibration is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. Include a description of your plans for ensuring that necessary channel checks, functional tests, periodic calibration, and maintenance will be conducted for the level measurement system and its supporting equipment; b) A description of how the guidance in NEI 12-02 Section 4.3 regarding compensatory actions for one or both non-functioning channels will be addressed; and c) A description of the compensatory actions to be taken in the event that one of the instrument channels cannot be restored to functional status within 90 days.

Audit Item Reference	Item Description
SE Review Item 1	<p>1. (RCS Venting) The generic analysis in WCAP-17601-P strictly addressed ELAP coping time without consideration of the actions directed by a site's mitigating strategies. WCAP-17792-P extends these analytical results through explicit consideration of mitigating strategies involving RCS makeup and boration. In support of the RCS makeup and boration strategies proposed therein, a generic recommendation is made that PWRs vent the RCS while makeup is being provided. Provide the following information in regard to this topic:</p> <ul style="list-style-type: none"> <li>a. Will the mitigating strategy include venting of the RCS?</li> <li>b. If so, please provide the following information: <ul style="list-style-type: none"> <li>i. The vent path to be used and the means for its opening and closure.</li> <li>ii. The criteria for opening the vent path.</li> <li>iii. The criteria for closing the vent path.</li> <li>iv. Clarification as to whether the vent path could experience two-phase or single-phase liquid flow during an ELAP. If two-phase or liquid flow is a possibility, clarify whether the vent path is designed to ensure isolation capability after relieving two-phase or liquid flow.</li> <li>v. If relief of two-phase or liquid flow is to be avoided, discuss the availability of instrumentation or other means that would ensure that the vent path is isolated prior to departing from single-phase steam flow.</li> <li>vi. If a pressurizer power-operated relief valve (PORV) is to be used for RCS venting, clarify whether the associated block valve would be available (or the timeline by which it could be repowered) in the case that the PORV were to stick open. If applicable, further explain why opening the pressurizer PORV is justified under ELAP conditions if the associated block valve would not be available.</li> <li>vii. If a pressurizer PORV is to be used for RCS venting, clarify whether FLEX RCS makeup pumps and FLEX steam generator makeup pumps will both be available prior to opening the PORV. If they will not both be available, provide justification.</li> </ul> </li> <li>c. If RCS venting will not be used, provide the following information: <ul style="list-style-type: none"> <li>i. The expected RCS temperature and pressure after the necessary quantity of borated makeup has been added to an unvented RCS.</li> <li>ii. Justification that the potential impacts of unvented makeup will not adversely affect the proposed mitigating strategy (e.g., FLEX pump discharge pressures will not be challenged, plant will not reach water solid condition, adequate boric acid can be injected, increased RCS leakage will not adversely affect the integrated plan timeline, etc.).</li> </ul> </li> </ul>
SE Review Item 2	<p>(Timeline to reflux cooling) Clarify whether procedural guidance for the timing of providing makeup to the reactor coolant system is based on analysis in WCAP-17792-P, pages 3-10 through 3-16. If so, provide justification for basing the timing of primary makeup on the assumption that reactor coolant pump seal leakage rates that are less than the maximum expected value under ELAP conditions will not increase.</p>
SE Review Item 3	<p>Provide confirmation that appropriate human factors are applied for the implementation of the FLEX strategies.</p>
SE Review Item 4	<p>Provide information on the refueling strategy for diesel powered FLEX equipment.</p>



Part 3 – Specific Topics for Discussion:

1. Draft of St. Lucie's OPD/FIP
2. Reactor systems analyses to include a discussion of applicability to WCAP-17601-P, boron mixing, WCAP-17792-P, and Nuclear Safety Advisory Letter (NSAL) 14-1
3. Training
4. Portable (FLEX) equipment maintenance and testing
5. RRC (SAFER) Response Plan for St. Lucie

### Proposed Schedule

#### Onsite Day 1, Monday, November 17, 2014

- 0800 Check in at site:  
Badging  
Dosimetry and whole body count for RCA entrance
- 0930 Entrance meeting
- 1000 Licensee presentation of strategies
- 1200 Lunch
- 1300 NRC Audit Team Activities:
- Technical area break-out discussions between NRC and licensee staff in the areas of reactor systems, electrical, balance-of-plant/structures, SFPI, and others
  - Review documents relating to open or confirmatory items, RAIs, codes, analyses, etc.
- 1600 NRC Audit Team meeting
- 1630 Team lead daily debrief/next day planning with licensee

#### Onsite Day 2, Tuesday, November 18, 2014

- 0830 NRC Audit Team Activities:
- Technical area break-out discussions between NRC and licensee staff in the areas of reactor systems, electrical, balance-of-plant/structures, SFPI, and others
  - Review documents relating to open or confirmatory items, RAIs, codes, analyses, etc.
- 1230 Lunch
- 1330 Continue NRC Audit Team Activities:
- Technical area break-out discussions between NRC and licensee staff in the areas of reactor systems, electrical, balance-of-plant/structures, SFPI, and others
  - Review documents relating to open or confirmatory items, RAIs, codes, analyses, etc.
- 1600 NRC Audit Team meeting
- 1630 Team lead daily debrief/next day planning with licensee

**Onsite Day 3, Wednesday, November 19, 2014**

0830 Check in at site; meet with Senior Resident/Resident

0900 NRC Audit Team Activities:

- Review documents relating to open or confirmatory items, RAIs, codes, analyses, etc.
- Mitigating Strategies/SFPI walk-throughs with licensee

1200 Lunch

1300 Continue NRC Audit Team Activities

1600 NRC Audit Team meeting

1630 Team lead daily debrief/next day planning with licensee

**Onsite Day 4, Thursday, November 20, 2014**

0830 Continue NRC Audit Team Activities

1200 Lunch

1300 Continue NRC Audit Team Activities

1600 NRC Audit Team meeting

1630 Team lead daily debrief/next day planning with licensee

**Onsite Day 5, Friday, November 21, 2014**

0830 NRC Audit Team meeting

0900 NRC/Licensee pre-exit meeting

1000 NRC/Licensee exit meeting

1030 Audit closeout/departure

M. Nazar

- 3 -

If you have any questions, please contact me at 301-415-5888 or by e-mail at Jason.Paige@nrc.gov.

Sincerely,

*/RA/*

Jason Paige, Project Manager  
Orders Management Branch  
Japan Lessons-Learned Division  
Office of Nuclear Reactor Regulation

Docket Nos.: 50-335 and 50-389

Enclosure:  
Audit plan

cc w/encl: Distribution via Listserv

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DATE	10/15/14	10/15/14	10/16/14	10/16/14
OFFICE	NRR/JLD/JERB/BC	NRR/JLD/JOMB/BC(A)	NRR/JLD/JOMB/PM	
NAME	BPham	CRoque-Cruz	JPaige	
DATE	10/16/14	10/16/14	10/16/14	

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