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

September 3, 2014

Mr. John Dent, Jr.
Site Vice President
Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
600 Rocky Hill Road
Plymouth, MA 02360-5508

SUBJECT: PILGRIM NUCLEAR POWER STATION - 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. MF0777 AND MF0778)

Dear Mr. Dent:

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-12-049, "Issuance of Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design-Basis External Events" and Order EA-12-051, "Issuance of 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, in part, that all 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. ML13063A063), Entergy Nuclear Operations (Entergy, the licensee) submitted its OIP for Pilgrim Nuclear Power Station (Pilgrim) in response to Order EA-12-049. By letters dated August 28, 2013 and February 28, 2014 (ADAMS Accession Nos. ML13247A411 and ML14069A320, respectively), Entergy submitted its first two 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 Pilgrim interim staff evaluation (ISE) (ADAMS Accession No. ML13225A587) and continues with in-office and onsite portions of this audit.

By letter dated February 28, 2013 (ADAMS Accession No. ML13063A097), Entergy submitted its OIP for Pilgrim in response to Order EA-12-051. By letter dated June 20, 2013 (ADAMS Accession No. ML13165A276), the NRC staff issued a request for additional information (RAI) to the licensee. By letters dated July 19, 2013, August 28, 2013, and February 28, 2014 (ADAMS Accession Nos. ML13207A142, ML13247A411, and ML14069A307, respectively), Entergy submitted its RAI responses and first two six-month updates to the OIP. The NRC staff issued the Pilgrim ISE and RAI on December 5, 2013 (ADAMS Accession No. ML13333A910). 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 Pilgrim in accordance with the enclosed audit plan from October 6-10, 2014.

If you have any questions, please contact me at 301-415-1544 or by e-mail at stephen.monarque@nrc.gov.

Sincerely,

Stephen R Monarque

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

Docket No.: 50-293

Enclosure:
Audit plan

cc w/encl: Distribution via Listserv

Audit Plan
Pilgrim Nuclear Power Station

BACKGROUND AND AUDIT BASIS

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-12-049, "Issuance of Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design-Basis External Events" and Order EA-12-051, "Issuance of 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, in part, that all 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 (hereafter referred to as the Integrated Plan) 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. ML13063A063), Entergy Nuclear Operations (Entergy, the licensee) submitted its Integrated Plan for Pilgrim Nuclear Power Station (Pilgrim, PNPS) in response to Order EA-12-049. By letters dated August 28, 2013 and February 28, 2014 (ADAMS Accession Nos. ML13247A411 and ML14069A320, respectively), Entergy submitted its first two six-month updates to the Integrated Plan. By letter dated August 28, 2013 (ADAMS Accession No. ML13234A503), the NRC notified all licensees and construction permit holders that the staff is conducting audits of their responses to Order EA-12-049 in accordance with NRC Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-111, "Regulatory Audits" (ADAMS Accession No. ML082900195). The purpose of the staff's audit is to determine the extent to which the licensees are proceeding on a path towards successful implementation of the actions needed to achieve full compliance with the order. This audit process led to the issuance of the Pilgrim interim staff evaluation (ISE) (ADAMS Accession No. ML13225A587) and continues with in-office and onsite portions of this audit.

By letter dated February 28, 2013 (ADAMS Accession No. ML13063A097), Entergy submitted its Integrated Plan for Pilgrim in response to Order EA-12-051. By letter dated June 20, 2013 (ADAMS Accession No. ML13165A276), the NRC staff issued a request for additional information (RAI) to the licensee. By letters dated July 19, 2013, August 28, 2013, and February 28, 2014 (ADAMS Accession Nos. ML13207A142, ML13247A411, and ML14069A307, respectively), Entergy submitted its RAI responses and first two six-month updates to the Integrated Plan. The NRC staff issued the Pilgrim ISE and RAI on December 5, 2013 (ADAMS Accession No. ML13333A910). 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.

Enclosure

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 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 (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 Integrated Plan 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) 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 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). For Order EA-12-051, the staff will make a safety determination regarding order compliance using the NEI developed 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). Should the licensee propose an alternative strategy or other method deviating from the guidance, as endorsed, for compliance, additional staff review will be required to evaluate the alternative strategy in reference to 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 Integrated Plan 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 Pilgrim Integrated Plan, 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 Spent Fuel Instrumentation 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

Title	Team Member
Lead Project Manager	Stephen Monarque
Technical Support	Brett Titus
Technical Support	Michael Levine
Technical Support	Matthew McConnell
Technical Support	Carla Roque-Cruz
Technical Support	Josh Miller

NRC AUDIT TEAM – SUPPLEMENTAL TEAM MEMBERS

Title	Team Member
Branch Chief	Stewart Bailey
Project Manager	Charles Norton

LOGISTICS

The audit will be conducted onsite at Pilgrim on October 6-9, 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 Pilgrim ISEs;
- OPD/FIP (current version), operator procedures, operator training plans, RRC (SAFER) playbook; and
- Materials/documentation for staff audit questions and/or licensee Integrated Plan 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, 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 primary system 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, SFPI locations, and related equipment mounting areas

8. Walk-through of the containment venting strategy, to include portable equipment, manual actions, and procedures to employ this strategy

Part 2 – Specific Technical Review Items:

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

Audit Item Reference	Item Description
ISE CI 3.1.1.2.A	The licensee identified that access to at least one connection point for the equipment will require access through routes that are not seismic class 1. However, the licensee has evaluated these routes and determined the potential for large scale debris field that would prevent access to the equipment, needed to be repowered, will not be present. Validate this evaluation.
ISE CI 3.1.1.3.A	Provide additional information concerning coping strategies for the failure of seismically qualified electrical equipment that can be affected by beyond design basis seismic events as discussed in NEI 12-06, Section 5.3.3, Consideration 1.
ISE CI 3.1.3.1.A	The storage of the flex equipment is in sea vans. The licensee is performing a calculation to demonstrate conformance with NEI 12-06, section 7.3.1.b, bullet 4 related to adequate tie down of the sea vans. Evaluation of the completed calculation must be completed to determine if it demonstrates conformance to guidance in NEI 12-06, section 7.3.1.b, bullet 4.
ISE CI 3.1.3.2.A	The licensee identified existing plant procedures that address hurricanes. These procedures need to be evaluated for conformance to NEI 12-06, Sections 7.3.2, Considerations 1, 2, and 5.

Audit Item Reference	Item Description
ISE CI 3.2.1.1.A	Based on the Electric Power Research Institute (EPRI) June 2013 report titled, "Use of Modular Accident Analysis Program (MAAP) in Support of Post-Fukushima Applications," (ADAMS Accession No. ML13190A201), and the NRC staff's position paper, dated October 3, 2013 (ADAMS Accession No. ML13275A318), benchmarks must be identified and discussed, which demonstrate that the MAAP 4 is an appropriate code for the simulation of an [Extended loss of alternating current power] ELAP event at Pilgrim.
ISE CI 3.2.1.1.B	Based on the two documents described in ISE CI 3.2.1.1.A, the collapsed level must remain above the Top Active Fuel (TAF) and the cool down rate must be within the Technical Specification limits.
ISE CI 3.2.1.1.C	Based on the two documents described in ISE CI 3.2.1.1.A, MAAP4 must be used in accordance with Sections 4.1, 4.2, 4.3, 4.4, and 4.5 of NEI's June 2013 position paper.
ISE CI 3.2.1.1.D	Based on the two documents described in ISE CI 3.2.1.1.A, in using MAAP4, the licensee must identify and justify the subset of key modeling parameters cited from Tables 4-1 through 4-6 of the "MAAP4 Application Guidance Desktop Reference for Using MAAP4 Software, Revision 2" (EPRI Report 1020236). This should include response at a plant specific level regarding specific modeling options and parameter choices for key models that would be expected to substantially affect the ELAP analysis performed for Pilgrim.
ISE CI 3.2.1.1.E	Based on the two documents described in ISE CI 3.2.1.1.A, the specific MAAP4 analysis case that was used to validate the timing of mitigating strategies in the integrated plan must be identified and should be available on the e-portal for NRC staff to view. Alternately, a comparable level of information may be included in the supplemental response. In either case, the analysis should include a plot of the collapsed vessel level to confirm that TAF is not reached (the elevation of the TAF should be provided) and a plot of the temperature cool down to confirm that the cool down is within the Technical Specifications limits.
ISE CI 3.2.1.2.A	The licensee is requested to provide the following information: Justification for the assumptions made regarding primary leakage from the recirculation pump seals and other sources; Assumed pressure dependence of the leakage rate; and Clarification on whether the leakage was determined or assumed to be single phase liquid, two phase mixture, or steam at the donor cell, and discuss how mixing of the leakage flow with the drywell atmosphere is modeled.
ISE OI 3.2.1.4.A	Pages 16, 23, and 63 of the Integrated Plan [NRC Order EA-12-049), dated February 28, 2013, ADAMS Accession No. ML13063A063], regarding Portable Equipment to Maintain Core Cooling, the licensee describes the use of potable pumps to provide [reactor pressure vessel] RPV injection. No technical basis or supporting analysis was provided for the diesel driven FLEX pump capabilities, considering the pressure within the RPV and the loss of pressure along with details regarding the FLEX pump supply line routes, length of hose runs, connecting fittings, and elevation changes, to show that the pump is capable of injecting water into the RPV with a sufficient rate to maintain and recover core inventory for both the primary and alternate flow paths.

Audit Item Reference	Item Description
ISE CI 3.2.1.5.A	The Integrated Plan does not identify non-powered local instrumentation other than Containment pressure and RPV level and pressure. The integrated plan identifies that Phase 2 equipment will have installed local instrumentation needed to operate the equipment. Identify the instrumentation that will be used to monitor portable FLEX electrical power equipment.
ISE CI 3.2.4.4.A	Provide complete details of portable lighting.
ISE CI 3.2.4.4.B	The licensee provided its communications assessment in letters dated October 31, 2012 and February 21, 2013([ADAMS Accession Nos]. ML12321A051 and ML13058A032), in response to the NRC letter dated March 12, 2012, [Title 10 of the *Code of Federal Regulations* (10 CFR)] 50.54(f) request for information letter. The NRC provided its evaluation on May 21, 2013 [(ADAMS Accession No.] (ML13127A179). The staff determined that the assessment for communications is reasonable, and the analyzed existing systems, proposed enhancements and interim measures will help to ensure that communications are maintained. Confirm that upgrades to the site's communications systems have been completed.
ISE CI 3.2.4.5.A	The Integrated Plan does not identify procedures/guidance with regard to the access to the Protected Area and internal locked areas. During the audit process, the licensee identified existing security doors provide egress capability and have key access in the event of a power loss. Operations and Security are currently researching options, the intention is to include it in the [emergency procedures] EP addressing BDBEE perimeters, the site declaration of 50.54X, and recognizing resource needs, including Security, and compensatory measures based on the event. Discuss the results.
ISE CI 3.2.4.8.A	During the audit process, the licensee was requested to provide electrical Single Line Diagrams showing the proposed connections of Phase 2 and 3 electrical equipment to permanent plant equipment. The licensee responded that Engineering Change markup of the One-Line Diagrams E13 and E14Sh1 (EC45555 and EC45556) will be posted to the ePortal. Provide these documents.
ISE CI 3.2.4.8.B	During the audit process, the licensee identified Engineering Changes are being developed to support the FLEX project which requires electrical studies to be performed. This includes the electrical diesel loading and load flow studies. The addition of the transfer switches and additional cable lengths are being incorporated into the Pilgrim design calculations (load flow, short circuit and coordination.) The staff needs to verify the FLEX diesel generator sizes after the loading calculations are finalized. Discuss the results of the design calculations.
ISE CI 3.2.4.10.A	Attachment 1 A of the Integrated Plan notes that at one hour, the ELAP decision is made and deep [direct current] dc load shedding begins at one hour (item 3), and at 2 hours the dc load shed is complete (item 4). The licensee was requested to provide the dc load profile with the required loads for the mitigating strategies to maintain core cooling, containment, and spent fuel pool cooling. During the audit process, the licensee responded that the dc load flow profiles are being developed as part of a new electrical battery FLEX extended operation load flow and battery sizing study PS258. The licensee is requested to provide a dc system analysis that shows the details of the load shedding and the available capacities of the batteries.

Audit Item Reference	Item Description
ISE CI 3.2.4.A	The licensee's plans for the use of offsite resources did not address considerations 2 through 10 of NEI 12-06, section 12.2
AQ 2	Entergy stated that protection of associated portable equipment from seismic hazards would be provided as follows: The HCVS is currently installed but will be enhanced in accordance with NRC Order EA-12-050, Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents and guidance in JLD-ISG-2012-02. The HCVS will meet the design requirements as specified for reasonable protection per NEI 12-06. The meaning and relevance of this statement is unclear as the requirement pertains to portable equipment. No portable equipment was identified as being required to maintain containment functions in any Phases of an ELAP (p. 39). The operation of Hardened Containment Vent System (HCVS) requires 125 VDC, which in phase 2 needs the FLEX DGs. Provide clarification of this statement and its relevance and intent to of NEI 12-06, Section 5.3.1.
AQ 4	On page 58 of 83 in the Integrated Plan, Section titled [boiling-water reactor] 'BWR Portable Equipment Phase 2,' Entergy identified two pickup trucks (¾ Ton) with trailer towing attachments and bed mounted 100 gallon fuel storage tank with transfer pump. Entergy's Integrated Plan does not provide a discussion of the protection to be afforded the trucks from any hazard. Provide additional information to demonstrate conformance to NEI 12-06, Section 5.3.2 consideration 5.
AQ 7	Entergy's flooding screen determination is not consistent with a known BDBEE. The Entergy Flooding Walk down Report (ADAMS Accession No. ML12333A321) dated November 27, 2012, evaluated the Probable Maximum Precipitation (PMP) event as part of the IPEEE in response to Generic Letter 88-20. It was determined that the PMP event exceeded the current licensing basis (CLB) flood level and produced water depths of 24.5 feet msl at buildings on the south side of the power block, and 22.5 feet msl at buildings on the north side of the power block. The use of this known BDBEE would result in the Pilgrim plant not screening to be a dry site since the PNPS Site general elevation is 23 ft msl. Provide additional details to demonstrate conformance to NEI 12-06, Section 6.2.1.

Audit Item Reference	Item Description
AQ 8	Entergy used design basis information from its Final Safety Analysis Report (87 mph) to determine that they did not need to screen in hurricanes. NEI 12-06, Section 7.2.1 provides the NRC-endorsed screening process for evaluation of high wind hazards. The screening for high wind hazards associated with hurricanes should be accomplished by comparing the site location to NEI 12-06, Figure 7-1 (Figure 3-1 of U.S. NRC, "Technical Basis for Regulatory Guidance on Design Basis Hurricane Wind Speeds for Nuclear Power Plants," NUREG/CR-7005, December, 2009 [Reference 21]); if the resulting frequency of recurrence of hurricanes with wind speeds in excess of 130 mph exceeds 10E-6 per year, the licensee is requested to address hazards due to extreme high winds associated with hurricanes. Since NEI 12-06 Figure 7-1 indicates hurricane wind speeds of approximately 160 to 170 mph at the Pilgrim site, the hurricane hazard should not have been screened out. Provide additional details to demonstrate conformance to NEI 12-06, Section 7.2.1.
AQ 9	The storage of portable equipment other than in existing safety-related structures requires that equipment exposed to the wind should be adequately tied down. Loose equipment should be in protective boxes that are adequately tied down to foundations or slabs to prevent protected equipment from being damaged or becoming airborne. The Integrated Plan does not discuss the anchoring of the equipment storage facilities e.g., sea vans. Provide additional details to demonstrate conformance to NEI 12-06, Section 7.3.1.b, bullet 4 and/or 7.3.1.c, bullet 2.
AQ 10	Per NEI 12-06, Section 7.3.2, the following three considerations for the deployment of portable equipment in high wind events should be addressed (numbering from NEI 12-06): 1, 2, and 5. The Integrated Plan inappropriately screened out hurricanes (see Open Item 3.1.3.A.), and therefore the three considerations listed above were not addressed. Provide additional details to demonstrate conformance to NEI 12-06, Section 7.3.2 considerations 1, 2, and 5.
AQ 12	Per NEI 12-06, Section 7.3.2, the following consideration for the deployment of portable equipment in high wind events should be addressed (numbering from NEI 12-06): 3. Deployment following a hurricane or tornado may involve the need to remove debris. Consequently, the capability to remove debris caused by these extreme wind storms should be included. The Integrated Plan, Attachment 1A, 'Sequence of Events Timeline,' (SOE) identifies the movement of DGs at before 8 hours and FLEX pumps at 6 – 9 hours. Until the arrival of the heavy duty debris removal equipment in Phase 3 from offsite, the only debris removal identified is a single on-site "Debris Removal Wheel Loader." It is not clear that one piece of debris removal equipment will be adequate to facilitate clear transport of FLEX equipment within the needed time constraint. Provide additional details to demonstrate conformance to NEI 12-06, Section 7.3.2 consideration 3.

Audit Item Reference	Item Description
AQ 24	The constraint for establishment of Spent Fuel Pool (SFP) ventilation is "as water temperature approaches 200°F [no time is identified]. The Integrated Plan, SOE Timeline in Attachment 1A, requires ventilation at 32 hours which is the calculated time that the SFP boils. The time to reach 212°F from 200°F is several hours. Provide clarification in the timeline as to the expected time for needed action.
AQ 25	Depending on primary containment environmental conditions during the event, safety/relief valve (SRV) actuation may require a higher than nominal dc voltage to actuate the SRVs. The SRV pilot solenoid coil electrical resistance will increase due to a higher containment temperature with a longer duration event than an existing station blackout coping time. Therefore, to achieve the necessary coil current, a higher voltage is needed to overcome the increase in the coil's resistance. The licensee is requested to evaluate their SRVs' qualification against the predicted containment response with FLEX implementation to ensure there will be sufficient dc bus voltage during the ELAP event. SRVs with shuttle valves may also require additional pneumatic supply pressure to actuate. This may require a higher pneumatic pressure and the ability to implement would be a plant specific action. Provide site-specific timing requirements needed for resources and installation of portable pneumatic supplies and potential higher voltage dc power to reliably actuate SRVs.
AQ 26	On page 55 of 83 of the Integrated Plan, the licensee identified Two 120/240 VAC 1-PH 12 kW generators, and Four 120/240 VAC 1-PH 6 kW generators to be deployed in Phase 2 for instrumentation. Please include in the SOE timelines when these will be deployed.
AQ 27	NEI 12-06 Section 3.2.1.7 states that: Actions specified in plant procedures/guidance for loss of ac power are predicated on use of instrumentation and controls powered by station batteries. In order to extend battery life, a minimum set of parameters necessary to support strategy implementation should be defined. The parameters selected must be able to demonstrate the success of the strategy. Typically, these parameters would include the following for BWR's: RPV Level, RPV Pressure, Containment Pressure, Suppression Pool Level, Suppression Pool Temperature, and SFP Level. The following dc powered instrumentation was listed by the licensee: Reactor Water Level, Reactor Pressure, Drywell Pressure, Reactor Core Isolation Cooling (RCIC) Suction Pressure and high pressure coolant injection (HPCI) Suction Pressure. Provide justification as to why battery powered instrumentation is not available for Suppression Pool Level, Suppression Pool Temperature, and Suppression Pool Pressure.

Audit Item Reference	Item Description
AQ 34	On pages 43 of 62, Entergy stated: Battery Room Ventilation The equipment and procedures to establish ventilation of the 125V & 250V Battery Rooms using portable fans to exhaust from the top of the room volumes to outside air using existing ventilation ducts will be provided to prevent H2 gas accumulation resulting from battery charging. On page 81 of 83 of the Integrated Plan, Entergy stated: Two 12" Duct Intrinsically Safe Portable Ventilation Fans are to be deployed, one in each DC Power System Battery Room, to provide forced exhaust ventilation to prevent the accumulation of Hydrogen gas that evolves from lead-acid battery charging. The fans are 120 VAC 1-PH AC Motor driven and can be powered from the 120 VAC outlets on the 480 VAC 3-PH 100 kVA DG that is charging the batteries or from any one of the small 120/240 VAC 1-PH 6 kW or 12 kW DGs. Provide justification on why the staging and use of the ventilation fans is not identified in the Integrated Plan, Attachment 1A SOE.
AQ 35	Entergy has not provided analysis on the hydrogen gas ventilation. Provide a discussion on the accumulation of hydrogen with respect to national standards and codes which limit hydrogen concentration to less than 1% (according to the National Fire Code and Regulatory Guide 1.128, "Installation Design and Installation of Vented Lead-Acid Storage Batteries for Nuclear Power Plants," which endorses Institute of Electrical and Electronics Engineers Standard 484, with exceptions) when the batteries are being recharged during Phase 2 and 3.
AQ 36	Page 7 of 83 indicates one of the DGs is pre-staged in the Turbine Building Truck Lock area. It is not clear if this is the location that the other one or two DGs will be staged and operated. Please provide additional detail on the need or means to ventilate the DG exhaust to facilitate personnel access.
AQ 37	Provide (1) Summary of sizing of FLEX diesel generators, and (2) Clarify, if the first FLEX DG staged in the Turbine Building Truck Lock becomes unavailable due to the Event and the other two FLEX DGs are dedicated to repowering both 125V DC batteries chargers simultaneously for next 8 hours, how will the 250 VDC battery be charged after first 8 hours of Phase 1.
AQ 38	The Integrated Plan does not identify any procedures/guidance that addresses the effects of loss of power to heat tracing. Information is not identified in the Integrated Plan as to whether or not freezing of piping or instrument lines have been addressed. Provide additional information to demonstrate compliance with NEI 12-06, Section 3.2.2, Guideline (12).
AQ 42	The location and elevation of the emergency diesel generator Fuel Storage Tanks are not specified. It cannot be determined if the tanks are inundated by the flood (see Open Item 3.1.2.A.) or if they are qualified for the other BDBEEs. Access by the FLEX Truck is not described. Provide the detailed fuel oil supply plan, and additional detail to conform to the guidance of NEI 12-06 Section 3.2.1.3.

Audit Item Reference	Item Description
AQ 43	On page 7 of 83, of its Integrated Plan, General Integrated Plan Elements, Number 4 describing time constraints, Entergy stated: It is anticipated that the decision to deploy the FLEX DGs will be made during the initial response phase; however battery durations are calculated to last at least 8 hours without credit for load shed during the initial Phase 1 response (Reference 14, 15, and 16). Please provide access to References 14, 15, and 16.
AQ 44	On page 63 of 83, in the section of its Integrated Plan describing the SOE timeline (Attachment 1A), Entergy stated: Item 6 at 4 hours: Pre-staged FLEX 100 kVA 480 VAC 3-PH Diesel Generator in Turbine Bldg. deployed and available to repower any one of the 125 or 250 VDC Battery Chargers. Item 8 at 8 hours: Transition from Phase 1 to Phase 2. At this time, at least two FLEX 100 kVA 480 VAC 3-PH DGs will have been deployed to repower the 125 & 250 VDC Battery Chargers to maintain the station dc Power Systems operating indefinitely. Clarify how the two FLEX generators will be connected to the 125V dc and 250 V dc battery chargers at 8 hours.
AQ 46	On page 65 of 83 in the Integrated Plan Sequence of Events section, for item 22, Entergy described transition from Phase 2 to Phase 3 at 72 hours post event. A determination cannot be made from the information in the Integrated Plan as to when the Regional Response Center assistance would be requested (not on the timeline) and what administrative procedure or program would trigger that request. Because additional information is required to assess this issue, a conclusion cannot be made that there is reasonable assurance the Integrated Plan satisfies the guideline of NEI 12-06 Section 12.2.
AQ 47	Review of the licensee's use of off-site resources, as described in the Integrated Plan, provides reasonable assurance that the proposed arrangement will conform to the guidance found in NEI 12-06, Section 12.2, with regard to the capability to obtain equipment and commodities to sustain and backup the site's coping strategies (guideline 1). However, there is insufficient information on how that guidance will be established to conform to the remaining items of NEI 12-06, Section 12.2 (guidelines 2 through 10). Provide additional information in the plan to demonstrate conformance with NEI 12-06, Section 12.2, guidelines 2 through 10.
AQ 58	Provide a detailed summary of the analysis and/or technical evaluation performed to demonstrate the adequacy of the ventilation provided in the RCIC pump room to support equipment operation throughout all phases of an ELAP.
AQ 59	Provide information on the adequacy of the ventilation provided in the battery room to protect the batteries from the effects of extreme high and low temperatures.

Audit Item Reference	Item Description
AQ 60	Describe plans for supplying fuel oil to FLEX equipment (i.e., fuel oil storage tank volume, supply pathway, etc.). Also, explain how fuel quality will be assured if stored for extended periods of time.
AQ 67	The licensee relies on General Electric Task Report 0000-0143-0382-R0 (RCIC System Operation in Prolonged Station Blackout - Feasibility Study, January 2012) and concludes that RCIC will continue to operate with suction from the suppression pool with temperatures up to 230 degrees F°. The staff requests the licensee to provide additional information to justify RCIC will continue to operate with a suppression pool suction greater than 200 degrees F°.
AQ 69	The licensee plans to use ground water well pumps during phases 2 and 3. The staff requests that the licensee provided information on the seismic qualification of the pumps.
SFPLI RAI 1	Provide plan view of SFP area showing SFP inside dimensions, planned locations/placement of primary and backup SFP level sensor, proposed routing of cables that will extend from these sensors toward location of display device.
SE Number 1	As a result of the staff's vendor audit, the staff wants to examine the licensee's coping strategy for electromagnetic compatibility.
SE Number 2	In the February 2014 six month update, Entergy reviewed the Pilgrim FLEX ISE (Reference 6) and identified one topic in the Technical Evaluation Report (TER) that needed clarification. TER Section 3.2.1.1, page 24 of 63. The second paragraph of this section includes a statement that the SOE "is based on an analysis using the industry developed MAAP Version 4 computer code." The third paragraph includes a similar statement: "The licensee has decided to use the MAAP4 computer code for simulating the ELAP event". Confirm the licensee's strategy is based on the simplified calculation instead of MAAP, and review the simplified calculation for adequacy.
SE Number 3	Verify that appropriate human factors are applied for the implementation of the FLEX strategies.
SE Number 4	Please address the following items regarding the use of raw water sources for mitigating an ELAP event: a. Please discuss the quality of the water (e.g., suspended solids, dissolved salts) that will be used for primary makeup during ELAP events, accounting for the potential for increased suspended or dissolved material in some raw water sources during events such as flooding or severe storms. b. Please discuss whether instrumentation available during the ELAP event is capable of providing indication that inadequate core cooling exists for one or more fuel assemblies due to blockage at fuel assembly inlets or bypass leakage flow paths. c. As applicable, please provide justification that the use of the intended raw water sources will not result in blockage of coolant flow across fuel assemblies and applicable bypass leakage flow paths to an extent that would inhibit adequate core cooling. If deleterious blockage at the core inlet cannot be precluded under ELAP conditions, then please discuss alternate means for assuring the adequacy of adequate core cooling in light of available indications. For example, will ELAP mitigation procedures be capable of ensuring top-down cooling of the reactor core?

Audit Item Reference	Item Description
SE Number 5	The NRC staff needs to review the Ventilation analysis for areas containing electrical equipment to ensure that the electrical equipment can perform as expected during a loss of ventilation as a result of ELAP (Primary areas will include HPCI/RCIC Pump Rooms, Switchgear Rooms, Main Control Room, and Battery Rooms).

Part 3 – Specific Topics for Discussion:

1. Draft of Pilgrim OPD/FIP

2. Reactor Systems Analyses, including calculations with the MAAP code and simplified hand calculations.

3. Training

4. Portable (FLEX) equipment maintenance and testing

5. RRC (SAFER) Response Plan for Pilgrim

Proposed Schedule

Onsite Day 1, Monday October 6, 2014

0800 Check in at site; Badging and dosimetry

0930 Entrance meeting

0945 Entergy Presentation of strategies

1130 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, and others.
- Review documents relating to open or confirmatory items, request for additional items, codes, analyses, etc.

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 2, Tuesday, October 7, 2014

0800 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 3, Wednesday, October 8, 2014

0800 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 4, Thursday, October 9, 2014

0800 Continue NRC Audit Team Activities

1200 Lunch

1300 Continue NRC Audit Team Activities

1400 NRC Audit Team Meeting

1500 NRC/Licensee pre-exit meeting

1530 NRC/Licensee exit meeting

1600 Audit closeout/departure

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 Pilgrim in accordance with the enclosed audit plan from October 6-10, 2014.

If you have any questions, please contact me at 301-415-1544 or by e-mail at stephen.monarque@nrc.gov.

Sincerely,
/RA/
Stephen Monarque, Project Manager
Orders Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No.: 50-293

Enclosure:
Audit plan
cc w/encl: Distribution via Listserv

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DATE	08/20/14	08/29/14	08/29/14	08/21/14
OFFICE	NRR/JLD/JOMB/(A)BC	NRR/JLD/JOMB/PM		
NAME	MHalter	SMonarque		
DATE	09/03/14	09/03/14		

OFFICIAL AGENCY RECORD