

February 28, 2014

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

**SUBJECT:** Pilgrim Nuclear Power Station's Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)

Pilgrim Nuclear Power Station  
Docket No. 50-293  
License No. DPR-35

LETTER NUMBER 2.14.011

- REFERENCE:**
1. NRC Order Number EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events", dated March 12, 2012 (PNPS Letter 1.12.013)
  2. NRC Interim Staff Guidance JLD-ISG-2012-01, Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, Revision 0, dated August 29, 2012 (ML 12229A174)
  3. Nuclear Energy Institute (NEI) 12-06, Revision 0, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide", dated August 2012
  4. Pilgrim Nuclear Power Station Letter to NRC, "Initial Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)", dated October 29, 2012 (PNPS Letter 2.12.072)
  5. Pilgrim Nuclear Power Station Letter to NRC, "Overall Integrated Plan Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)", dated February 28, 2013 (PNPS Letter 2.13.012)
  6. NRC Order Number EA-12-050, "Order to Modify Licenses With Regard To Reliable Hardened Containment Vents", dated March 12, 2012 (PNPS Letter 1.12.014)

A151  
LIRR



7. NRC Order Number EA-13-109, "Order to Modify Licenses With Regard To Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions", dated June 6, 2013 (PNPS Letter 1.13.028)

8. Pilgrim Nuclear Power Station Letter to NRC, "Pilgrim Nuclear Power Station's First Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)" dated August 28, 2013 (PNPS Letter 2.13.069)

Dear Sir or Madam:

On March 12, 2012, the Nuclear Regulatory Commission ("NRC" or "Commission") issued an Order (Reference 1) to Entergy. Reference 1 was immediately effective and directs Entergy to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of an initial status report 60 days following issuance of the final interim staff guidance (Reference 2) and an overall integrated plan pursuant to Section IV, Condition C. Reference 2 endorses industry guidance document NEI 12-06, Revision 0 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided the Pilgrim Station initial status report regarding mitigation strategies. Reference 5 provided the Pilgrim Overall Integrated Plan.

Reference 1 requires submission of a status report at six-month intervals following submittal of the overall integrated plan. Reference 3 provides direction regarding the content of the status reports. Reference 8 provided the first six-month status report. The purpose of this letter is to provide the second six-month status report pursuant to Section IV, Condition C.2, of Reference 1, that delineates progress made in implementing the requirements of Reference 1. The attached report provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any.

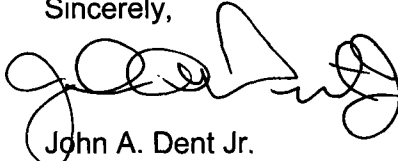
The FLEX strategies in the Overall Implementation Plan presently rely on the current conceptual design of the reliable hardened vent (RHV) system that was developed in response to Reference 6, NRC Order EA-12-050. Reference 7, NRC Order EA-13-109, dated June 6, 2013, rescinds the requirements of NRC Order EA-12-050. Compliance with the requirements of NRC Order EA-12-050, including applicable schedule deadlines for submittals or implementation, is no longer required. The industry, through NEI and the owners' group, is addressing the new requirements provided in NRC Order EA-13-109 on the schedule outlined in NRC Order EA-13-109. Because of the new order (NRC Order EA-13-109), the design of the hardened containment vent is being reevaluated. Any design changes resulting from the revised hardened vent order will be reflected in a future six month status report.

Should you have any questions concerning the content of this letter, please contact Mr. Joseph R. Lynch, Manager, Regulatory Assurance at (508) 830-8403.

This letter contains no new regulatory commitments.

I declare under penalty of perjury that the foregoing is true and correct; executed on February 28, 2014.

Sincerely,



John A. Dent Jr.  
JAD/rmb

Attachment: Pilgrim Nuclear Power Station's Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)

cc: Mr. William M. Dean  
Regional Administrator, Region 1  
U.S. Nuclear Regulatory Commission  
2100 Renaissance Boulevard, Suite 100  
King of Prussia, PA 19406-1415

U. S. Nuclear Regulatory Commission  
Director, Office of Nuclear Reactor Regulation  
One White Flint North  
11555 Rockville Pike  
Washington, DC 20555-0001

Ms. Nadiyah Morgan, Project Manager  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Mail Stop O-8C2A  
Washington, DC 20555

Mr. John Giarrusso Jr.  
Planning, Preparedness & Nuclear Section Chief  
Mass. Emergency Management Agency  
400 Worcester Road  
Framingham, MA 01702

U. S. Nuclear Regulatory Commission  
Attn: Robert J. Fretz Jr.  
OWFN, Mailstop # 4A15A  
11555 Rockville Pike  
Rockville, MD 20852-2378

U. S. Nuclear Regulatory Commission  
Attn: Robert L. Dennig  
OWFN, Mailstop # 10E1  
11555 Rockville Pike  
Rockville, MD 20852-2378

U. S. Nuclear Regulatory Commission  
Attn: Ms. Jessica A. Kratchman  
OWFN, Mailstop # 9D2  
11555 Rockville Pike  
Rockville, MD 20852-2378

U. S. Nuclear Regulatory Commission  
Attn: Mr. Eric E. Bowman  
OWFN, Mailstop # 12D20  
11555 Rockville Pike  
Rockville, MD 20852-2378

NRC Resident Inspector  
Pilgrim Nuclear Power Station

**ATTACHMENT**

**To**

**PNPS Letter 2.14.011**

**PILGRIM NUCLEAR POWER STATION'S  
SECOND SIX-MONTH STATUS REPORT IN RESPONSE TO MARCH 12, 2012  
COMMISSION ORDER MODIFYING LICENSES WITH REGARD TO  
REQUIREMENTS FOR MITIGATION STRATEGIES FOR BEYOND-DESIGN-  
BASIS EXTERNAL EVENTS  
(ORDER NUMBER EA-12-049)**

## **Attachment**

### **Pilgrim Nuclear Power Station's Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)**

#### **1. Introduction**

Entergy Nuclear Operations, Inc. (Entergy) developed an Overall Integrated Plan (Reference 1) for Pilgrim Nuclear Power Station (PNPS), documenting the diverse and flexible strategies (FLEX), in response to Reference 2. This attachment provides an update of milestone accomplishments since submittal of the Overall Integrated Plan, including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

#### **2. Milestone Accomplishments**

The following milestone(s) have been completed since July 31, 2013, and are current as of January 31, 2014.

- First Six-Month Status Report — August 2013
- Second Six-Month Status Report — Complete with submission of this document in February 2014.

#### **3. Milestone Schedule Status**

The following provides an update to Attachment 2 of the Overall Integrated Plan. It provides the activity status of each item, and whether the expected completion date has changed. The dates are planning dates subject to change as design and implementation details are developed.

- No new additions or changes to target completion dates for this report.

PNPS's Second Six Month Status Report for the Implementation of FLEX  
February 28, 2014

Milestone	Target Completion Date*	Activity Status	Revised Target Completion Date
Submit 60 Day Status Report	October 2012	Complete	
Submit Overall Integrated Implementation Plan	February 2013	Complete	
Submit Six-Month Status Report	August 2013	Complete	
Submit Six-Month Status Report	February 2014	Complete	
Modifications Approved for Implementation	February 2014	In Progress	
Develop Training Plan	March 2014	Not Started	
Submit Six-Month Status Report	August 2014	Not Started	
Procedure Changes Training Material Complete	October 2014	Not Started	
Submit Six-Month Status Report	February 2015	Not Started	
Implement Training (Schedule LORT Plan to Support Implementation)	March 2015	Not Started	
Modification Implementation Complete	May 2015	Not Started	
Demonstration / Functional Test	June 2015	Not Started	
Submit Six-Month Status Report	August 2015	Not Started	
Submit Completion Report	December 2015	Not Started	

\*Target Completion Date is the last submitted date from either the overall integrated plan or previous six-month status report.

#### 4. Changes to Compliance Method

There are no changes to the compliance method as documented in the Overall Integrated Plan (Reference 1).

#### 5. Need for Relief/Relaxation and Basis for the Relief/Relaxation

PNPS expects to comply with the order implementation date and no relief/relaxation is required at this time.

#### 6. Open Items from Overall Integrated Plan and Interim Staff Evaluation

The following tables provide a summary and status of any open items documented in the Overall Integrated Plan and any open items or confirmatory items documented in the Interim Staff Evaluation (ISE). A fourth table includes a listing of Audit Questions which require additional information for complete closure.

PNPS's Second Six Month Status Report for the Implementation of FLEX  
February 28, 2014

Overall Integrated Plan Open Item	Status
1. Beyond-design-basis external event impact on requirements in existing licensing documents will be determined based on input from the industry groups and direction from the NRC.	Not Started
2. Structure, content and details of the Regional Response Center playbook will be determined.	Not Started

Interim Staff Evaluation Open Items	Status
3.2.1.4.A — On pages 16, 23, and 63 of the Integrated Plan regarding Portable Equipment to Maintain Core Cooling, the licensee describes the use of portable pumps to provide RPV injection. No technical basis or a 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 hoses 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.	<p>Pilgrim calculation M1384, Rev. 0 documents the plant hydraulic analysis that incorporates the plant FLEX design modifications and the use of two diesel-driven pumps as described in the Integrated Plan.</p> <p>The approval of this calculation is pending based on the approval of EC 45558, which is used for calculation input.</p>

Interim Staff Evaluation Confirmatory Items	Status
3.1.1.1.A — The Integrated Plan does not specify procedures and programs will provide for securing large portable equipment to protect them during a seismic event or to ensure unsecured and/or non-seismic components do not damage the equipment as is specified in NEI 12-06, Section 5.3.1, considerations 2 and 3.	In Progress
3.1.1.2.A — The licensee identified that access to at least one connection point for the equipment will requires access through routes that are not FSAR Seismic Class I, however they have been evaluated and the potential for large scale debris field that would prevent access to the equipment needed to be repowered is not present. Their evaluation should be validated during the site audit.	In Progress
3.1.1.3.A — The licensee was requested to 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.	In Progress



PNPS's Second Six Month Status Report for the Implementation of FLEX  
February 28, 2014

Interim Staff Evaluation Confirmatory Items	Status
<p>3.1.3.1.A — The storage of the FLEX equipment is in sea vans. The licensee is in the process of 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.</p>	In Progress
<p>3.1.3.2.A — During the audit process, the licensee identified that there are existing plant procedures that address hurricanes. The procedures need to be evaluated for conformance to NEI 12-06, considerations 1, 2, and 5.</p>	In Progress
<p>3.2.1.1.A — From the June 2013 position paper, benchmarks must be identified and discussed which demonstrate that the Modular Accident Analysis Program (MAAP) 4 is an appropriate code for the simulation of an Extended Loss of AC Power (ELAP) event at your facility.</p>	In Progress
<p>3.2.1.1.B — The collapsed level must remain above Top of Active Fuel (TAF) and the cool down rate must be within technical specification limits.</p>	In Progress
<p>3.2.1.1.C — MAAP4 must be used in accordance with Sections 4.1, 4.2, 4.3, 4.4, and 4.5 of the June 2013 position paper.</p>	In Progress
<p>3.2.1.1.D — 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" (Electric Power Research Institute Report 1 020236). 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 that licensee's plant.</p>	In Progress
<p>3.2.1.1.E — 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 ePortal 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 tech spec limits.</p>	In Progress

PNPS's Second Six Month Status Report for the Implementation of FLEX  
February 28, 2014

Interim Staff Evaluation Confirmatory Items	Status
<p>3.2.1.2.A —The following is requested:</p> <ol style="list-style-type: none"> <li>1. Justification for the assumptions made regarding primary system leakage from the recirculation pump seals and other sources.</li> <li>2. Assumed pressure-dependence of the leakage rate.</li> <li>3. 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.</li> </ol>	In Progress
<p>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. The licensee needs to identify the instrumentation that will be used to monitor portable FLEX electrical power equipment.</p>	In Progress
<p>3.2.4.2.A — The licensee was requested to provide the maximum calculated MCR temperature and a detailed summary of the analysis used to determine the temperature and the procedure for control of MCR temperature. The licensee response was that existing procedure 2.4.149 addresses "Loss of MCR H&amp;V". The procedure is symptom driven, containing temperature limits to perform actions, and it is not time driven. Pilgrim will provide the referenced "GOTHIC" evaluation. Evaluation of the "GOTHIC" analysis is needed to evaluate the MCR temperature.</p>	In Progress
<p>3.2.4.4.A — The licensee needs to provide complete details of portable lighting.</p>	In Progress
<p>3.2.4.4.B — The licensee provided its communications assessment in letters dated October 31, 2012 and February 21, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML12321A051 and ML13058A032) in response to the NRC letter dated March 12, 2012, 50.54(f) request for information letter. The NRC staff provided its evaluation on May 21, 2013 (ADAMS Accession No. ML13127A179). The NRC staff has 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. This has been identified for confirmation that upgrades to the site's</p>	In Progress

PNPS's Second Six Month Status Report for the Implementation of FLEX  
February 28, 2014

Interim Staff Evaluation Confirmatory Items	Status
communications systems have been completed.	
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 that 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 addressing DDBEE perimeters, the site declaration of 50.54(x), and recognizing resource needs, including Security, and compensatory measures based on the event.	In Progress
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 & EC45556), will be posted to the ePortal. The NRC staff will complete the review after they are posted.	Markup of one-line diagrams E13 and E14Sh1 was provided on the Entergy ePortal 10/07/2013 (Audit Question PNPS-066).
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 FLEX diesel generator sizes need to be verified after the loading calculations are finalized.	In Progress
3.2.4.10.A — Attachment 1 A of the Integrated Plan notes that at one hour, the ELAP decision is made and deep 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.	In Progress
3.2.4.10.B — The licensee was requested to provide a detailed discussion on the loads that will be shed from the dc bus, the equipment location (or location where the required action needs to be taken). During the audit	In Progress

PNPS's Second Six Month Status Report for the Implementation of FLEX  
February 28, 2014

Interim Staff Evaluation Confirmatory Items	Status
process, the licensee responded by identifying that a tentative list of loads proposed to isolate, isolation time and panel locations are available and provided in the ePortal. The licensee will finalize the load-shed list after a review by Operations.	
3.4.A — The licensee's plans for the use of off-site resources did not address considerations 2 through 10 of NEI 12-06, Section 12.2.	In Progress

Audit Questions	Status	Completion or Target Date
PNPS-002	Closed	
PNPS-003	Closed	
PNPS-004	Closed	
PNPS-006	Closed	
PNPS-007	Closed	
PNPS-008	Closed	
PNPS-009	In progress	August 2014
PNPS-010	Closed	
PNPS-011	Closed	
PNPS-012	Closed	
PNPS-014	Closed	
PNPS-015	In progress	August 2014
PNPS-016	In progress	August 2014
PNPS-017	In progress	August 2014
PNPS-018	Closed	
PNPS-019	In progress	August 2014
PNPS-020	Closed	
PNPS-021	Closed	
PNPS-022	Closed	
PNPS-024	Closed	
PNPS-025	Closed	
PNPS-026	In progress	August 2014
PNPS-027	Closed	
PNPS-030	Closed	
PNPS-032	Closed	
PNPS-033	In progress	August 2014
PNPS-034	Closed	
PNPS-035	Closed	
PNPS-036	Closed	
PNPS-037	Closed	
PNPS-038	Closed	
PNPS-039	Closed	
PNPS-040	Closed	

PNPS's Second Six Month Status Report for the Implementation of FLEX  
February 28, 2014

Audit Questions	Status	Completion or Target Date
PNPS-042	Closed	
PNPS-043	Closed	
PNPS-044	Closed	
PNPS-046	Closed	
PNPS-047	In progress	August 2014
PNPS-049	Closed	
PNPS-053	Closed	
PNPS-054	In progress	August 2014
PNPS-055	In progress	August 2014
PNPS-056	Closed	
PNPS-057	In progress	August 2014
PNPS-058	Closed	
PNPS-059	Closed	
PNPS-060	Closed	
PNPS-065	In progress	August 2014
PNPS-066	Complete	Markup of one-line diagrams E13 and E14Sh1 provided on the Entergy ePortal 10/07/2013
PNPS-067	Closed	
PNPS-068	Closed	
PNPS-070	Closed	
PNPS-071	Closed	

## 7. Potential Interim Staff Evaluation Impacts

Entergy has reviewed the Pilgrim FLEX ISE (Reference 6) and identified one topic in the Technical Evaluation Report (TER) that requires clarification. A summary is provided below.

- TER Section 3.2.1.1, Page 24 of 63 — The second paragraph of this section includes a statement that the Sequence of Events (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.” These statements should be clarified. As previously discussed during the audit process, Entergy stated that the Pilgrim SOE is based on a conservative simplified heat balance calculation rather than a MAAP analysis. A MAAP analysis was also performed. This analysis was considered a validation of the simplified calculation because the MAAP results were more favorable. Even though the MAAP results were more favorable, Entergy uses the more conservative simplified calculation as the basis for the FLEX strategy. Entergy does plan to revise the Pilgrim MAAP analysis in order to address the generic MAAP concerns. The revision will be performed in accordance with the NRC staff endorsement (Reference 7) of NEI’s position paper on MAAP (Reference 8). The results of the analysis will be made available on the Entergy ePortal by the next six-month status report (August 2014).

PNPS's Second Six Month Status Report for the Implementation of FLEX  
February 28, 2014

## 8. References

The following references support the updates to the Overall Integrated Plan described in this enclosure.

1. Pilgrim Nuclear Power Station's "Overall Integrated Plan in Response To March 12, 2012, Commission Order Modifying Licenses With Regard To Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," dated February 28, 2013.
2. NRC Order Number EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012.
3. NRC Order Number EA-12-050, Order to Modify Licenses with Regard to Reliable Hardened Containment Vents, dated March 12, 2012.
4. NRC Order Number EA-13-109, Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions, dated June 6, 2013.
5. Pilgrim Nuclear Power Station Letter to NRC, "Pilgrim Nuclear Power Station's First Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)" dated August 28, 2013 (PNPS Letter 2.13.069).
6. NRC Letter, "Pilgrim Nuclear Power Station - Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies) (TAC No. MF0777)," dated December 16, 2013.
7. NRC Letter to NEI (ML13275A318), dated October 3, 2013.
8. "Use of Modular Accident Analysis Program (MAAP4) in Support of Post-Fukushima Applications," Report No. 3002001785, EPRI, June 2013 (ML13190A201).