



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION I  
2100 RENAISSANCE BLVD., SUITE 100  
KING OF PRUSSIA, PA 19406-2713

February 11, 2016

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

SUBJECT: PILGRIM NUCLEAR POWER STATION – INTEGRATED INSPECTION  
REPORT 05000293/2015004

Dear Mr. Dent:

On December 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Pilgrim Nuclear Power Station (PNPS). The enclosed report documents the inspection results, which were discussed on January 25, 2016, with you and other members of your staff.

NRC Inspectors examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The inspectors documented four findings of very low safety significance (Green) in this report. All four of these findings involve violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at PNPS. In addition, if you disagree with the cross-cutting aspect assigned to any finding, or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at PNPS.

J. Dent

-2-

In accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390 of the NRCs "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Arthur Burritt, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

Docket No. 50-293  
License No. DPR-35

Enclosure:  
Inspection Report 05000293/2015004  
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

J. Dent

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Sincerely,

*/RA/*

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**U.S. NUCLEAR REGULATORY COMMISSION**

## REGION I

Docket No. 50-293

License No. DPR-35

Report No. 05000293/2015004

Licensee: Entergy Nuclear Operations, Inc (Entergy)

Facility: Pilgrim Nuclear Power Station

Location: 600 Rocky Hill Road  
Plymouth, MA 02360

Dates: October 1, 2015 through December 31, 2015

Inspectors: E. Carfang, Senior Resident Inspector  
B. Scrabeck, Resident Inspector  
J. Pflingstien, Reactor Engineer  
S. Elkhiamy, Project Engineer  
B. Dionne, Health Physicist  
J. DeBoer, Emergency Preparedness Inspector  
T. Dunn, Operations Engineer  
T. Hedigan, Operations Engineer  
P. Presby, Operations Engineer  
T. Fish, Senior Operations Engineer

Approved By: Arthur Burritt, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

Enclosure

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## SUMMARY

Inspection Report 05000293/2015004; 10/01/2015 – 12/31/2015; Pilgrim Nuclear Power Station (PNPS); Problem Identification and Resolution and Follow-Up of Events and Notices of Enforcement Discretion.

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. The inspectors identified four non-cited violations (NCVs), all of which were of very low safety significance (Green). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process", dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of U.S. Nuclear Regulatory Commission (NRC) requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

### Cornerstone: Initiating Events

- Green. A self-revealing Green NCV of Title 10 of the *Code of Federal Regulations* (10 CFR) 50, Appendix B, Criterion III, "Design Control," was identified because Entergy did not use the correct work planning and design controls to repair the support for the nitrogen supply line for the 1C inboard main steam isolation valve (MSIV). Specifically, inadequate design controls led to a failed horizontal unistrut support for the nitrogen supply line to the 1C MSIV, resulting in the header resting on the main steam line. This caused vibration-induced cyclic failure of the nitrogen supply line, closure of 1C MSIV, and a plant scram. The damaged line was modified and repaired using an additional unistrut for support as determined by the engineering change process. Entergy entered the issue into the corrective action program (CAP) under condition report (CR) 2015-07285.

This finding is more than minor because it is associated with the Initiating Events cornerstone attribute of equipment performance and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure of the pneumatic supply header support resulted in a plant scram due to the vibration induced cyclic failure of the nitrogen supply line and subsequent closure of 1C MSIV. In accordance with IMC 0609.04 and Exhibit 1 of IMC 0609, Appendix A, the inspectors determined that this finding was of very low safety significance (Green) because the finding did not involve the complete or partial loss of a support system that contributes to the likelihood of, or cause, an initiating event and affect mitigation equipment. The inspectors determined this finding does not have a cross-cutting aspect because the performance deficiency occurred in 2001 and is not indicative of current performance. (Section 4OA3)

## Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," when Entergy did not determine the cause of a significant condition adverse to quality (SCAQ). Specifically, a causal evaluation was not performed for a failed safety-related relay that ensured the automatic operation of the low pressure coolant injection (LPCI) system injection valves in a degraded voltage condition. Entergy replaced the failed relay and restored LPCI to an operable status on May 10, 2015. Entergy entered the issue into the CAP as CR 2015-9762.

This finding is more than minor because it is associated with the Mitigating System cornerstone attribute of equipment performance and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The failure to identify the cause and extent of condition of the relay failure as directed by site procedures could result in repeat events which adversely affect safety system availability. In accordance with IMC 0609.04 and Exhibit 2 of IMC 0609, Appendix A, the inspectors determined that this finding was of very low safety significance (Green) because the finding did not involve the design of a mitigating structure, system, or component (SSC) or a loss of function of a train or system for greater than the technical specification (TS) allowed outage time. The inspectors determined this finding has a cross-cutting aspect in Human Performance, Procedure Adherence, because individuals did not recategorize the CR to a higher level requiring a causal evaluation, as required by EN-LI-102 when a licensee event report (LER) was issued. The site also did not retain the failed safety-related part, as required by EN-MA-101-02. [H.8] (Section 4OA3)

- Green. The inspectors identified an NCV of TS 5.4.1, "Procedures," because Entergy was not adequately maintaining procedures listed in Regulatory Guide (RG) 1.33, Revision 2, Appendix A, February 1978. Specifically, the inspectors identified several examples where Entergy staff inappropriately used Entergy procedure EN-OP-112, "Night and Standing Orders," to implement procedure changes instead of PNPS quality assurance procedure NOP98A1, "Procedure Process." Entergy entered the issue into the CAP as CR 2015-09233.

The performance deficiency was determined to be more than minor because if left uncorrected it has the potential to lead to a more significant safety concern. Specifically, the inspectors determined the issue was similar to Example 4.a of IMC 0612, Appendix E, which states that an insignificant procedure error would be more than minor if the licensee routinely failed to adhere to the applicable procedure. The inspectors evaluated the finding using IMC 0609, Attachment 4 and Appendix A. Using Exhibit 2 of Appendix A, the inspectors determined this finding was of very low safety significance (Green) because it did not involve a design or qualification deficiency, it would not lead to a potential or actual loss of system or safety functions, it did not involve the loss or degradation of equipment or a function specifically designed to mitigate a seismic, flooding, or severe weather initiating event, and it did not involve the total loss of any safety function as identified in Exhibit 4. The inspectors determined that the finding had a cross-cutting aspect in Problem Identification and Resolution, Resolution, because, Pilgrim did not adhere to the CAP evaluation and corrective action program timeliness requirements that would have likely led them to use the appropriate procedure change process. [P.3] (Section 4OA2)

**Cornerstone: Barrier Integrity**

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," because Entergy did not adequately implement corrective actions for an identified condition adverse to quality. Specifically, Entergy did not implement all of the procedure changes needed to ensure shutdown cooling was placed in service in a timely manner after plant shutdown in preparation for or during a severe winter storm. Entergy entered this issue into the CAP as CR 2016-0120 and updated procedure 2.1.42 to meet the requirements of the corrective actions in CR 2015-0558. Inspectors verified that the new procedure revision included the required actions.

The inspectors determined this performance deficiency is more than minor because it is associated with the procedure quality attribute of the Barrier Integrity cornerstone, and adversely affected its objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The inspectors determined that this finding is of very low safety significance (Green) in accordance with IMC 0609, Attachment 4 and Exhibit 3 of Appendix A, because it did not represent an actual open pathway in the physical integrity of reactor containment, containment isolation system, and heat removal components. The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Procedure Adherence, because Entergy staff did not ensure procedure revisions were made in accordance with the requirements of EN-LI-102, "Corrective Action Program." [H.8] (Section 4OA2)



## REPORT DETAILS

### Summary of Plant Status

The unit began the inspection period at 100 percent power. On October 20, 2015, operators reduced power to approximately 50 percent to perform a main condenser thermal backwash. The unit returned to 100 percent power on October 21, 2015 and remained at or near 100 percent power for the remainder of the inspection period.

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

#### 1R01 Adverse Weather Protection (71111.01 – 2 samples)

##### .1 Readiness for Seasonal Extreme Weather Conditions

###### a. Inspection Scope

The inspectors reviewed Entergy's readiness for the onset of seasonal low temperatures. The December 15, 2015, review focused on the cold weather preparations and actions from the January 12, 2015, storm. Walkdowns of the auxiliary boiler and emergency diesel generators (EDGs) were included in the inspection. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), TSs, control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Entergy personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including Entergy's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

###### b. Findings

No findings were identified.

##### .2 Readiness for Impending Adverse Weather Conditions

###### a. Inspection Scope

The inspectors reviewed Entergy's preparations prior to the potential landfall of Hurricane Joaquin on October 1–2, 2015. The inspectors reviewed the implementation of adverse weather preparation procedures before the onset of and during this adverse weather condition. The review focused on Entergy's preparations for the storm. The inspectors reviewed station procedures including Entergy's coastal storm, high wind, and severe weather procedures. The inspectors performed walkdowns of the site to ensure that station personnel had identified issues that could challenge the operability of systems during high wind and winter storm conditions. The inspectors discussed readiness and staff availability for adverse weather response with operations and work control personnel.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Station blackout diesel generator with the 'B' EDG out of service (OOS) for planned maintenance on October 15, 2015
- 'A' standby gas treatment system while 'B' standby gas treatment was OOS for planned maintenance on November 10, 2015
- Station blackout diesel generator following emergent maintenance on December 18, 2015

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TSs, work orders, CRs, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted the system's performance of its intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Entergy staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

The week of December 21, 2015, inspectors performed a complete system walkdown of accessible portions of the 'B' EDG to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify as-built system configuration matched plant documentation, and that system components and support equipment remained operable. The inspectors confirmed that systems and components were aligned correctly, free from interference from temporary services or isolation boundaries,

environmentally qualified, and protected from external threats. The inspectors also examined the material condition of the components for degradation and observed operating parameters of equipment to verify that there were no deficiencies. For identified degradation, the inspectors confirmed the degradation was appropriately managed by the applicable aging management program. Additionally, the inspectors reviewed a sample of related CRs and work orders to ensure Entergy appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 4 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Entergy controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for OOS, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Standby liquid control pumps and equipment area on October 1, 2015
- Auxiliary boiler room on November 30, 2015
- Main control room on December 3, 2015
- High pressure coolant injection (HPCI) room on December 3, 2015

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on November 10, 2015, that involved a fire in the north yard near the fire water storage tank. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that Entergy personnel identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions as required. The inspectors evaluated the following specific attributes of the drill:

- Proper wearing of turnout gear and self-contained breathing apparatus (SCBA)
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques

- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with Entergy's fire-fighting strategies.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 2 samples)

.1 Internal Flooding Review

a. Inspection Scope

The inspectors reviewed on November 27 – December 3, 2015, the UFSAR, the site flooding analysis, and plant procedures to assess susceptibilities involving internal flooding. The inspectors reviewed the CAP to determine if Entergy identified and corrected flooding problems and whether operator actions for coping with flooding were adequate. The inspectors focused on the HPCI room to verify the adequacy of equipment seals, penetration seals, watertight door seals, common drain lines, level alarms, and flood barriers as described in the design basis documents.

b. Findings

No findings were identified.

.2 Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

On October 26, 2015, the inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could affect risk-significant equipment. The inspectors performed walkdowns of risk-significant areas including manhole 27B, that contains cables for the 'B' residual heat removal pump and 'B' core spray pump, and manhole 'L', which contains cables important to safety for the station blackout EDG, to verify that the cables were not submerged in water, that cables and/or splices appeared intact, and to observe the condition of cable support structures. When applicable, the inspectors verified proper sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure that the cables will not be submerged. The inspectors also ensured that drainage was provided and functioning properly in areas where dewatering devices were not installed. For those cables found submerged in water, the inspectors verified that Entergy had conducted an operability evaluation for the cables and were implementing appropriate corrective actions.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance  
(71111.11Q – 2 samples, 71111.11A – 1 sample, 71111.11B - 1 sample)

.1 Quarterly Review of Licensed Operator Regualification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on November 16, November 30, and December 7, 2015, in which there was a loss of offsite power (LOOP) with the A8 electrical bus OOS for maintenance, requiring the declaration of an Unusual Event when emergency power was supplied to the safety busses. A breaker failure resulted in the HPCI system being unavailable for injection. Subsequent to the LOOP, there was a small break loss of coolant accident (LOCA) of continually increasing severity, resulting in the declaration of an Alert due to loss of reactor vessel integrity. The 'A' EDG failed to automatically start on the LOOP, requiring manual action to power the A5 vital bus. The increasing severity of the LOCA exceeded the capacity of the high pressure injection sources, requiring an emergency depressurization of the reactor. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal operating procedures (AOPs) and emergency operating procedures (EOPs). The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed and reviewed the calibration of a reactor water cleanup area temperature indication used in EOP and emergency action level (EAL) evaluation on October 27, 2015. The inspectors observed the evolution briefing, shift briefing, and reactivity control briefings to verify that the briefings met the criteria specified in EN-OP-115, "Conduct of Operations," Revision 16. Additionally, the inspectors observed work performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

.3 Operator Requalification

a. Inspection Scope

The following inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 10, and Inspection Procedure 71111.11, "Licensed Operator Requalification Program."

Examination Results

Requalification exam results for 2015 were reviewed to determine if pass/fail rates were consistent with the guidance of IMC 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The review verified that the failure rate (individual or crew) did not exceed 20 percent.

- The overall individual failure rate was 0.0 percent
- The crew failure rate was 0.0 percent

Written Examination Quality

The inspectors reviewed three comprehensive written exams previously administered to the operators in August and September 2014.

Operating Test Quality

The inspectors reviewed annual operating tests (scenarios and job performance measures (JPMs)) associated with two different examination weeks.

Licensee Administration of Operating Tests

The inspectors observed facility training staff administer dynamic simulator exams and JPMs. These observations included facility evaluations of crew and individual operator performance during the simulator exams and individual performance of JPMs.

Exam Security

The inspectors assessed whether facility staff properly safeguarded exam material, and whether test item repetition was excessive.

Remedial Training Program

The inspectors reviewed two remediation packages, including re-tests, associated with operators who failed their 2014 biennial written exam.

### Conformance with License Conditions

License reactivation and license proficiency records were reviewed to ensure that 10 CFR 55.53 license conditions and applicable program requirements were met. The

inspectors also reviewed a sample of records for requalification training attendance, and a sample of medical examinations for compliance with license conditions and NRC regulations.

### Simulator Performance

Simulator performance and fidelity were reviewed for conformance to the reference plant control room. A sample of simulator deficiency reports (DRs) was also reviewed to ensure facility staff addressed identified modeling problems.

### Problem Identification and Resolution

The inspectors reviewed recent operating history documentation found in inspection reports, LERs, Entergy's CAP, NRC end-of-cycle and mid-cycle reports, and the most recent NRC plant issues matrix. The resident staff was also consulted for insights regarding licensed operators' performance. The inspectors focused on events associated with operator errors that may have occurred due to possible training deficiencies.

#### b. Findings

No findings were identified.

### 1R12 Maintenance Effectiveness (71111.12Q – 2 samples)

#### a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on SSC performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance work orders, and maintenance rule basis documents to ensure that Entergy was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by Entergy staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that Entergy staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Maintenance Rule 50.65 (a)(3) Periodic Assessment from November 19 – December 3, 2015
- Review of Maintenance Rule Functional Failure determinations and the (a)(1) action plan for the Main Steam system on December 14–22, 2015

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 4 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Entergy performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Entergy personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Entergy performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Unplanned maintenance of the Bus A6 undervoltage relays on October 2, 2015
- Planned maintenance on LPCI with increased trip risk due to post-storm salt buildup on switchyard insulators on October 6, 2015
- Unplanned maintenance on the 'A' EDG on October 26, 2015.
- Missed surveillance test for reactor core isolation cooling system (RCIC) steamline primary containment isolation valve on November 30 and December 1, 2015

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 5 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions based on the risk significance of the associated components and systems:

- Degraded lateral support for salt service water (SSW) piping on October 14, 2015
- 'B' standby liquid control pump oil leak on November 13, 2015
- SSW pump 'A' stabilizer arms unable to be installed following pump maintenance on November 18, 2015
- HPCI pump elevated vibrations during quarterly surveillance test on November 19, 2015
- 'A' EDG trouble alarm for fuel oil strainer high differential pressure on November 26, 2015 (operator workaround)



The inspectors evaluated the technical adequacy of the operability determination to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and USFAR to Entergy's evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations. Where compensatory measures were required to maintain operability, such as in the case of operator workarounds, the inspectors determined whether the measures in place would function as intended and were properly controlled by Entergy. Based on the review of the selected operator workaround listed above, the inspectors verified that Entergy identified operator workarounds at an appropriate threshold and addressed them in a manner that effectively managed operator workaround-related adverse effects on operators and SSCs.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modifications listed below to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted a field walkdown of the modification to verify that the temporary modification did not degrade the design bases, licensing bases, and performance capability of the affected systems.

- Engineering change temporary modification 61530 – Cross-connection of city water to support 10-inch header meter test on November 20, 2015

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 7 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, observed the pre-job brief and post-job critique where

possible, confirmed work site cleanliness was maintained, and witnessed the test or reviewed test data to verify quality control hold points were performed and checked and that results adequately demonstrated restoration of the affected safety functions.

- Replacement of the 'A' reactor building closed cooling water pump mechanical seal on September 10, 2015
- Replacement of electrolytic capacitors, cooling fan, and the K1 relay in the RCIC alternate shutdown inverter on September 30, 2015
- Replacement of Bus A6 undervoltage relay 127A-A6/2 on October 2, 2015
- 'B' EDG maintenance outage on October 16, 2015
- 'A' feedwater regulating valve packing leak adjustment on October 21, 2015
- 'A' EDG damper 208A repair on October 26, 2015
- Overhaul of the 'A' SSW pump on November 19, 2015

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 2 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and Entergy procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- SSW pump quarterly and biennial (comprehensive) operability and valve operability tests for the 'B' SSW pump on October 27, 2015
- HPCI quarterly surveillance test on November 9, 2015

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04 – 1 sample)

a. Inspection Scope

Entergy implemented various changes to the PNPS EALs, Emergency Plan, and Implementing Procedures. Entergy had determined that, in accordance with 10 CFR 50.54(q)(3), any change made to the EALs, Emergency Plan, and its lower-tier

implementing procedures, had not resulted in any reduction in effectiveness of the Plan, and that the revised Plan continued to meet the standards in 50.47(b) and the requirements of 10 CFR 50 Appendix E.

The inspectors performed an in-office review of all EAL and Emergency Plan changes submitted by Entergy as required by 10 CFR 50.54(q)(5), including the changes to lower-tier emergency plan implementing procedures, to evaluate for any potential reductions in effectiveness of the Emergency Plan. This review by the inspectors was not documented in an NRC Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety. The requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 – 2 samples)

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine Entergy emergency drill on October 27, 2015, to identify any weaknesses and deficiencies in the classification and notification activities. The inspectors observed alert and site area emergency response operations in the simulator and emergency operations facility to determine whether the event classification and notifications were performed in accordance with procedures.

The inspectors evaluated the conduct of a routine Entergy emergency drill on December 2, 2015, to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed a notice of unusual event, alert, and general emergency response in the simulator, technical support center, and emergency operations facility to determine whether the event classifications, notifications, and protective action recommendations were performed in accordance with procedures.

The inspectors attended the station drill critiques to compare inspector observations with those identified by Entergy staff in order to evaluate Entergy critique and to verify whether the Entergy staff was properly identifying weaknesses and entering them into the CAP.

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

### Cornerstone: Occupational and Public Radiation Safety

#### 2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

##### a. Inspection Scope

On November 16–19, 2015, the inspectors reviewed Entergy’s performance in assessing and controlling radiological hazards in the workplace. The inspectors used the requirements contained in 10 CFR 20, TS, applicable RGs, and the procedures required by TS as criteria for determining compliance.

##### Contamination and Radioactive Material Control

The inspectors observed the monitoring of potentially contaminated material leaving the radiological control area and inspected the methods and radiation monitoring instrumentation used for control, survey, and release of that material. The inspectors selected several sealed sources from inventory records and assessed whether the sources were accounted for and were tested for loose surface contamination. The inspectors evaluated whether any recent transactions involving nationally tracked sources were reported in accordance with requirements.

##### b. Findings

No findings were identified.

#### 2RS2 Occupational ALARA Planning and Controls (71124.02 – 1 sample)

##### a. Inspection Scope

On November 16–19, 2015, the inspectors assessed performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used the requirements in 10 CFR Part 20, RG 8.8, RG 8.10, TS, and Entergy’s procedures required by TS as criteria for determining compliance.

##### Radiological Work Planning

The inspectors compared the results achieved (dose rate reductions, actual dose) with the intended dose established in Entergy’s ALARA planning for current radiological work activities. The inspectors compared the person-hour estimates provided by maintenance planning and other groups to the radiation protection (RP) group actual person-hours for the work activity, and evaluated the accuracy of these time estimates. The inspectors assessed the reasons for any inconsistencies between intended and actual work activity doses. The inspectors determined whether post-job reviews were conducted to identify lessons learned. If problems were identified, the inspectors verified that worker suggestions for improving dose and contamination reduction techniques were entered into Entergy’s CAP.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 – 1 sample)

a. Inspection Scope

On November 16–19, 2015, the inspectors reviewed the control of in-plant airborne radioactivity and the use of respiratory protection devices in these areas. The inspectors used the requirements in 10 CFR 20, RG 8.15, RG 8.25, NUREG/CR-0041, TS, and procedures required by TS as criteria for determining compliance.

Engineering Controls

The inspectors reviewed the adequacy of airborne radioactivity monitoring in the plant based on location, sensitivity, and alarm setpoints.

Use of Respiratory Protection Devices

The inspectors reviewed the adequacy of Entergy’s use of respiratory protection devices in the plant to include applicable ALARA evaluations, respiratory protection device certification, respiratory equipment storage, air quality testing records, and individual qualification records.

Self-Contained Breathing Apparatus for Emergency Use

The inspectors reviewed the following: the status and surveillance records for three SCBAs staged in-plant for use during emergencies; SCBA procedures and maintenance and test records; the refilling and transporting of SCBA air bottles; SCBA mask size availability; and the qualifications of personnel performing service and repair on this equipment.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04 – 1 sample)

a. Inspection Scope

On November 16–19, 2015, the inspectors reviewed the monitoring, assessment, and reporting of occupational dose. The inspectors used the requirements in 10 CFR 20, RGs, TS, and procedures required by TS as criteria for determining compliance.

External Dosimetry

The inspectors reviewed: dosimetry National Voluntary Laboratory Accreditation Program accreditation status; onsite storage of dosimeters; the use of “correction factors” to align electronic personal dosimeter results with National Voluntary Laboratory

Accreditation Program dosimetry results; dosimetry occurrence reports; and CAP documents for adverse trends related to external dosimetry.

#### Internal Dosimetry

The inspectors reviewed: internal dosimetry procedures; whole body counter measurement sensitivity and use; adequacy of the program for whole body count monitoring of plant radionuclides; adequacy of the program for dose assessments based on air sample monitoring and the use of respiratory protection; and internal dose assessments for any recorded internal exposures.

#### Special Dosimetric Situations

The inspectors reviewed external dose monitoring of workers in large dose rate gradient environments and dose assessments performed since the last inspection that used multi-badging, skin dose, or neutron dose assessments.

#### b. Findings

No findings were identified.

### 4. **OTHER ACTIVITIES**

#### 4OA1 Performance Indicator Verification (71151 – 4 samples)

##### .1 Mitigating Systems Performance Index

#### a. Inspection Scope

The inspectors reviewed Entergy's submittal of the Mitigating Systems Performance Index for the following systems for the period of October 1, 2014, through September 30, 2015.

- Emergency alternating current power system
- Cooling water system

To determine the accuracy of the performance indicator (PI) data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed Entergy's operator narrative logs, CRs, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

#### b. Findings

No findings were identified.

.2 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors reviewed Entergy submittals for the occupational radiological occurrence PIs for the fourth quarter 2014 through the third quarter 2015. The inspectors used PI definitions and guidance contained in NEI Document 99-02, Revision 7, to determine the accuracy of the PI data reported. The inspectors reviewed electronic personal dosimetry accumulated dose alarms, dose reports, and dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized PI occurrences. The inspectors also conducted walkdowns of various locked high radiation area entrances and very high radiation area entrances to determine the adequacy of the controls in place for these areas.

b. Findings

No findings were identified.

.3 Radiological Effluent TS/Offsite Dose Calculation Manual Radiological Effluent Occurrences

a. Inspection Scope

The inspectors reviewed Entergy submittals for the radiological effluent TS/Offsite Dose Calculation Manual radiological effluent occurrences PI for the fourth quarter 2014 through the third quarter 2015. The inspectors used PI definitions and guidance contained in NEI Document 99-02, Revision 7, to determine if the PI data was reported properly. The inspectors reviewed the public dose assessments for the PI for public radiation safety to determine if related data was accurately calculated and reported.

The inspectors reviewed the CAP database to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous and liquid effluent summary data and the results of associated offsite dose calculations to determine if PI results were accurately reported.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 7 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify Entergy entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures

and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, Entergy performed an evaluation in accordance with 10 CFR Part 21.

.2 Semi-Annual Trend Review (1 sample)

a. Inspection Scope

The inspectors performed a semi-annual review of site issues to identify trends that might indicate the existence of more significant safety concerns. As part of this review, the inspectors included repetitive or closely-related issues documented by Entergy in trend reports, site PIs, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or CAP backlogs. The inspectors also reviewed Entergy's CAP database for the third and fourth quarters of 2015 to assess CRs written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily CR review (Section 40A2.1). The inspectors reviewed the Entergy trend reports to verify that Entergy personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

No findings were identified.

Inspectors reviewed the trend reports covering April 2015 through September 2015. In September 2015, Pilgrim shifted from quarterly to trimester aggregate performance review meetings, as directed by EN-LI-121, "Trending and Performance Review Process," Revision 18. In the second quarter trend review, Entergy noted that CR 2014-380 regarding the four NRC cross-cutting aspects in the area of Problem Resolution was a resolved item. Inspectors reviewed the actions and did not identify concerns, but found that the effectiveness review for the CR remained open due to the repetition of cross-cutting aspects in the area of Problem Resolution. The inspectors also observed incorrect categorizations of CRs for two SCAQs.

A negative trend in operability evaluations over the course of 2015 was identified by Entergy. In the Operations Department Performance Review Meeting Report for November and December 2015, Nuclear Internal Oversight designated operability determinations as an issue requiring increased awareness due to several issues with adequacy. Entergy has added the issue to the Operations department Excellence Plan. The site has developed additional training for licensed operators for operability determinations. In 2015 the plant received four NRC-identified NCVs related to operability determinations.

.3 Annual Sample: Five year review of Pilgrim root cause evaluations (1 sample)

a. Inspection Scope

The inspectors performed an in-depth review of Entergy's root cause evaluation and corrective actions associated with CR 2015-0375, Failure to Meet Three of Four of the



NRC's 95002 Inspection Objectives, which was written on January 26, 2015. The inspectors assessed Entergy's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and timeliness of corrective actions to determine whether Entergy was appropriately identifying, characterizing, and correcting problems associated with the issue. Inspectors focused on the corrective action to review all root causes from 2010 to 2014 for quality issues. The inspectors compared the actions taken to the requirements of 10 CFR 50, Appendix B.

b. Findings and Observations

No findings were identified.

A contributing cause in CR 2015-0375 was identified regarding the quality of CAP products. This led to an extent of cause corrective action to review all root cause evaluations from the past five years and 25 percent of apparent cause evaluations from the past three years. In total, 27 root cause evaluations and 31 apparent cause evaluations were reviewed by an independent third party for errors and omissions related to cause derivation, extent of condition, extent of cause, and adequate corrective actions.

Among the 55 evaluations reviewed, Entergy identified 13 instances of behavioral/organizational weaknesses that were not addressed in approved evaluations and one root cause evaluation (CR 2013-4190) that required updating based on the results of a vendor report from a turbine auxiliary oil pump motor fire in 2013. In response to the gaps identified in behavioral/organizational performance evaluation, Entergy expanded the review to include previous evaluations for equipment failures involving human performance errors from January 1, 2015, through October 9, 2015. These reviews were ongoing at the time of the inspection.

Overall, inspectors determined that the adverse conditions associated with the applicable root cause evaluations were corrected; however, organizational behaviors were not addressed in accordance with CAP requirements for causal evaluations. The expansion of the review provides an opportunity to identify organization trends that may indicate underlying programmatic weaknesses that should be addressed.

.4 Annual Sample: Winter Storm Preparations (1 sample)

a. Inspection Scope

The inspectors performed an in-depth review of Entergy's associated actions related to switchyard vulnerabilities during severe winter storms. The inspectors reviewed the interim corrective actions taken by Entergy to address severe storm vulnerabilities. Entergy reviewed historical data for winter storm-related LOOPs to determine the range of parameters for which vulnerabilities existed, and corrective actions were established to revise Entergy procedure 2.1.42, "Operation During Severe Weather," to incorporate guidance to place the plant in cold shutdown in advance of an anticipated LOOP. Based on wind speed, wind direction, temperature, snowfall rate, National Weather Service forecasts, and switchyard indications, actions ranging from controlled shutdown to immediate plant scram are prescribed, dependent on conditions observed at the plant

and National Weather Service forecasts. The inspectors' review of these changes focused on ensuring that appropriate guidance was available for plant operators to operate safely during severe winter storms.

In addition to the primary interim corrective action of a procedurally directed shutdown, the inspectors reviewed an engineering change intended to mitigate snow and ice accumulation on switchyard insulator surfaces by the deployment of heat lamp towers to be used during adverse weather conditions. This engineering change includes individual heat lamp towers installed in several locations in the switchyard to provide direct heating to vulnerable areas to reduce the likelihood of flashover due to snow and ice accumulation. These towers are powered by portable diesel generators and therefore are independent of plant power supplies. Additional procedural requirements have been established to test equipment prior to the winter weather season, as well as before impending severe weather, to ensure availability if called upon. The inspectors performed a walkdown of the installed equipment to verify it was installed in accordance with the approved engineering change. A total of nine heat lamps were installed in the switchyard.

b. Observations

The inspectors reviewed the interim corrective actions to address severe storm vulnerabilities. They identified weaknesses that are discussed in the finding below. Entergy updated the procedure to correct these weaknesses. The inspectors did not identify additional issues with the interim corrective actions, and concluded that they are reasonable.

c. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," because Entergy did not adequately implement corrective actions for an identified condition adverse to quality. Specifically, Entergy did not implement all of the procedure changes needed to reduce plant risk by ensuring shutdown cooling was placed in service in a timely manner after plant shutdown in preparation for or during a severe winter storm.

Description. On January 27, 2015, Winter Storm Juno resulted in a loss of transmission capability from both 345kV transmission lines. This resulted in a full load reject of the main generator, a subsequent reactor scram, and loss of the startup transformer. Entergy entered this issue into their CAP (CR 2015-0558), and performed a root cause evaluation. The station's root cause evaluation identified inadequate analysis of available weather-related data and insufficient procedural guidance for operator's regarding the decision making needed to maneuver the plant in a timely manner during blizzard conditions. Specifically, Procedure 2.1.42, "Operation During Severe Weather," did not provide the actions necessary to preclude the automatic scram and reduce risk from LOOP conditions.

Entergy's corrective actions for this issue directed revising procedure 2.1.42, "Operation During Severe Weather," to ensure operators were provided appropriate direction for maneuvering the plant in response to challenges during storm conditions. The corrective action directed that once the reactor was shutdown, the procedure should tell operators to commence a normal depressurization until shutdown cooling was placed in

service and should include required action times for placing the system in service. The intent of these actions was to prevent putting heat directly into containment when the LOOP occurred which would reduce the risk significance of the LOOP.

The inspectors reviewed the station's root cause and corrective actions and the revised procedures. They determined that the completed corrective action was not adequately implemented in accordance with EN-LI-102, "Corrective Action Program." EN-LI-102, requires, in part, that "individuals closing corrective actions verify that the required action has been taken ensuring that the response is adequate, answers all aspects of the assigned action, and the intent of the action is met." The logical sequence of the revised Section 7.12 of Procedure 2.1.42, "Operation During Severe Weather," Revision 28, did not require operators to place shutdown cooling in service as part of the normal or controlled shutdown procedure steps and required action times were only included for commencement of shutdown, not for placing shutdown cooling in service. The revision only included a note that stated that the objective of the section was to complete a controlled shutdown and be in shutdown cooling prior to a LOOP.

Entergy entered this issue into the CAP as CR 2016-0120 and updated procedure 2.1.42 to meet the requirements of the corrective actions to prevent recurrence designated in CR 2015-0558. Inspectors verified that the new procedure revision includes the required actions.

Analysis. The inspectors determined that not adequately implementing corrective actions directed by the CAP was a performance deficiency. The inspectors determined this performance deficiency is more than minor because it is associated with the procedure quality attribute of the Barrier Integrity cornerstone, and adversely affected its objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, insufficient guidance led to improper decision making during Winter Storm Juno, and, absent adequate procedure changes, vulnerability continued to exist for reducing risk and challenging containment integrity (not putting heat directly in containment) following a similar type of event. The inspectors determined that this finding screened to very low safety significance (Green) in accordance with IMC 0609, Attachment 4 and Exhibit 3 of Appendix A, because the finding did not represent an actual open pathway in the physical integrity of reactor containment, containment isolation system, and heat removal components.

The inspectors determined that this finding has a cross-cutting aspect in the area of Human Performance, Procedure Adherence, in that individuals follow processes, procedures, and work instructions. Specifically, Entergy staff did not ensure procedure revisions were made in accordance with EN-LI-102, "Corrective Action Program." Consequently, the corrective actions to prevent reoccurrence were closed out without proper instruction for placing shutdown cooling in service prior to a LOOP or partial LOOP. [H.8]

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, measures should be established to ensure that conditions adverse to quality are identified and corrected. Contrary to this, Entergy's CAP did not assure that a condition adverse to quality associated with site operating procedures was corrected. Specifically, Entergy did not adequately implement procedure changes needed to ensure shutdown cooling was placed in service in a timely manner after the plant was shutdown to reduce

risk in preparation for an approaching winter storm. Because this finding was of very low safety significance (Green), and has been entered into the CAP as CR 2016-0120, this violation is being treated as an NCV, consistent with section 2.3.2.a of the Enforcement Policy. **(05000293/2015004-01: Inadequate Implementation of Corrective Action following Winter Storm Juno)**

.5 Annual Sample: Occupational Radiation Protection Program (1 sample)

a. Inspection Scope

On November 16–19, 2015, the inspectors performed an in-depth review of the adverse trend in radiation worker practices documented in CR 2014-2304. The inspectors reviewed Entergy’s evaluations and corrective actions for issues associated with the Occupational RP Program against the regulations in 10 CFR 20, “Standards for Protection against Radiation,” and the procedures required by PNPS TSs. The inspectors reviewed RP events documented in the CRs to assess Entergy’s performance relative to initiating corrective/compensatory actions, prioritizing actions, timeliness, and addressing adverse trends. In addition, two telephone interviews were conducted with the PNPS RP Manager and the RP Department Performance Improvement Coordinator on December 17 and 22, 2015, to further investigate the RP Program performance. The inspectors also conducted walkdowns in the radiological control area, interviewed plant personnel, and reviewed recent RP audits/self-assessments and CRs, as well as any associated apparent cause evaluations.

b. Findings and Observations

No findings were identified.

The inspectors determined that Entergy’s problem identification for RP, evaluation, extent of condition, and corrective actions were thorough, and the causes were appropriately identified. The inspectors also determined that the corrective actions were reasonable and met the requirements for the occupational radiation safety program.

Entergy had conducted a thorough review of the RP CRs, self-assessments, observations, quality assurance audits, and NRC radiation safety inspections for 2013 and 2014 to determine generic problem areas. An RP department improvement plan was developed, reviewed, and approved in June 2014. This report identified gaps in RP performance and provided a comprehensive corrective action plan addressing each. The inspectors reviewed the status of the corrective actions from this plan and determined that all corrective actions were being tracked and completed under work ticket WT-WTPNP-2014-00224.

In March 2015, Entergy initiated another corrective action plan entitled, “2015-2016 Pilgrim Nuclear Power Station Radiation Protection Department ‘Pursuit of Excellence’ Plan.” This report identified seven RP initiatives and associated corrective actions to further drive performance improvement. The inspectors reviewed the status of the corrective actions from this plan and determined that the corrective actions were being tracked and completed under work ticket WT-WTPNP-2015-00104.

The inspectors concluded that Entergy's problem identification, evaluation, and completed corrective actions for the occupational radiation safety program were appropriate and thorough.

.6 Annual Sample: Operator Human Performance, Simulator Training and Control Room Activities (3 samples)

a. Inspection Scope

On October 27–29, November 3–5, and November 9–12, the inspectors performed three separate inspection samples related to operator human performance, simulator training, and control room activities. These samples included observations of the following activities: an emergency plan drill in the simulator, two weekly training scenarios, an evaluated simulator training scenario, an operating crew simulator examination, and multiple control room observations during which various evolutions were in progress. The inspectors also evaluated the operating crew's simulator exam self-evaluation, the examination evaluation team's assessment of crew performance regarding critical tasks, and individual and crew weaknesses to assure they were captured and tracked to improve performance.

The inspectors reviewed Entergy's implementation of several station programs including: Operator Compensatory Measures, Operations Decision Making Instructions, SOs, EOP and Severe Accident Guideline (SAG) controls, and compliance with operator license restrictions. The inspectors also evaluated whether station personnel were identifying issues at an appropriate level and correctly using station processes to address issues consistent with their relative safety significance. This evaluation included interviews of various licensed operators, as well as a review of corrective actions related to weaknesses in EOP execution during a reactor scram on January 27, 2015.

b. Observations

The inspectors determined that the formality in the control room and simulator was appropriate and that in general, the operators appropriately used human performance tools such as briefs and three way communications, procedure place keeping, and peer checking. Additionally, overall, the inspectors concluded that training was being performed in accordance with Pilgrim's training program. The inspectors did note some minor observations, which are discussed below.

Peer Checking

During observation of 'B' EDG monthly surveillance testing in the main control room, the inspectors noted that operator peer checks for control board manipulations did not meet management's expectations, as described in procedure EN-OP-117. Although a peer check was used, the direction of the switch manipulations and the check to assure the procedure directed the action were not performed on two control board switch actions. The Shift Manager was informed, he provided crew coaching on the spot, and initiated CR 2015-09192. The inspectors determined that this performance deficiency was minor because the manipulation of controls were in accordance with the 'B' EDG monthly surveillance test procedure, and failure to perform the peer check in accordance as identified in EN-OP-117 criteria did not invalidate the surveillance test results.

### Pre-Job Briefing

The inspectors observed a control room pre-job briefing prior to maintenance personnel disconnecting a temperature element input to a recorder to support planned troubleshooting activities. This instrument is used for entry conditions to EOPs and emergency planning. Pilgrim procedure EP-AD-270, "Equipment Important to Emergency Response," allows instrumentation to be removed from service for maintenance or testing without compensatory measures in place provided: 1) personnel removing the equipment from service remain in the immediate area, and 2) the equipment can be restored to service promptly. The senior reactor operator who led the brief mentioned they would use other indicators if needed. However, the temperature indication work was for the clean-up filter area, and there were no other temperature elements in the area. The affected temperature element could have been reconnected in a short time period, however this was not discussed in the pre-job brief. Therefore, this activity did not represent a procedural violation, however the inspector determined that the brief would have been enhanced if the senior reactor operator had identified what entry conditions and emergency declarations this instrument is used for and the expectations to restore the indication if necessary. Entergy wrote CR 2015-09140 to evaluate this issue.

### Operator Compensatory Measures

The inspectors reviewed 24 open Operator Compensatory Measures. The facility's program as documented in procedure 1.3.34.4, "Compensatory Measures," establishes a hierarchy in level of importance from highest to lowest as 1) workaround, 2) burden, 3) tour item. At the time of the inspection, Entergy was tracking one operator workaround, one burden, and 22 tour items. The inspectors determined that the operator burden should be classified as an operator workaround. Entergy agreed and changed the classification. Additionally, the inspectors questioned if one of the tour items should be reclassified at a higher level of importance as a burden or an operator workaround. Entergy wrote CR 2015-08940 and CR 2015-08847 to evaluate the condition. The inspectors determined that this issue was minor because the incorrect classification of the deficiency did not adversely affect the capability of operators to implement abnormal and emergency procedures.

### Simulator Deficiency Reports

The inspectors reviewed the simulator group activities related to issues that were documented in simulator DRs and in Simulator Performance Analysis 15-001 from the Winter Storm Juno event of January 27, 2015. The inspectors concluded that a generally thorough evaluation by Entergy simulator staff generated numerous simulator DRs and at least one CR to fix a plant problem identified during the comparison of simulator to plant response. The inspectors identified two issues with Entergy's resolution of DRs as described below:

- DR B5-025 documented an action that lowered the rate of instrument air system pressure drop in the simulator to match plant response, as observed during the Winter Storm Juno event. Post-DR testing in the simulator failed to evaluate the impact of this modeling change on the normal system compressor loading/unloading rate. Entergy staff agreed the modeling change likely adversely affected fidelity of the normal simulator response and generated a new DR to investigate.

- DR B5-017 documented that SSW bay level indication on the simulator failed to drop to zero on loss of air pressure and also that bay low level alarms should not occur on the loss of air pressure. The support staff misunderstood the DR initiator to only include alarms on the process computer associated with the bay level indicators and closed the DR after fixing the level indicators with no action taken on the overhead annunciators associated with bay low level. In response to inspector questioning, simulator support staff determined the overhead annunciators should not alarm on loss of air pressure, just as stated by the original DR initiator. They re-opened the DR to correct the problem.

The inspectors determined that these issues were minor violations of 10 CFR 55.46.d.2, "Simulation Facilities," because the inspectors determined that the impact of the negative training provided by these discrepancies did not adversely affect operator response to an event..

#### Operator Training Corrective Actions

The inspectors reviewed Entergy's corrective actions from the Winter Storm Juno event related to operator training and concluded the training adequately addressed the event. Entergy conducted two hours of classroom and two hours of simulator training for licensed operators on the event, covering plant response, operator actions, lessons learned, and changes to the loss of air AOP. Entergy also conducted cyclic training on subsequent revisions to the AOP. All appropriate licensed operator EOP training on lessons learned from this event (CR 2015-00813) was completed by July 25, 2015, and evaluated as satisfactory. Additionally, Entergy issued Revision 7 to Procedure 5.3.35, "Pilgrim Nuclear Power Station Operations Emergency and Transient Response Strategies," which added information related to critical parameter control strategies as a result of operating experience from the Winter Storm Juno event.

#### Review of EOPs and SAGs

The inspectors reviewed EOP and SAG flowchart document revisions to assure that the latest revisions were available in the technical support center, main control room, and simulator. Minor discrepancies were identified by the inspectors, as discussed below:

- The inspectors identified a discrepancy between EOP-01, "RPV [reactor pressure vessel] Control Instructor Guide" (O-RO-03-04-03, Revision 11,) and the actual wording of EOP-01, Step L-6. The instructor guide states "If RPV water level drops to -45", then the operator is directed to Inhibit ADS". EOP-01, step L-6 states, "BEFORE RPV water level drops to -45" then continue to Inhibit ADS." Entergy documented this discrepancy in CR 2015-09202.
- During a main control room observation on November 10, 2015, the inspectors identified a lack of approval and effective date on the SAG-01 flowchart located in the main control room. Entergy entered this issue into their CAP as CR 2015-09193 and replaced the effective date and signature sticker.

The inspectors determined that these issues were minor since these discrepancies did not negatively impact the operation of plant systems.

c. Findings

Introduction. The inspectors identified a Green NCV of TS 5.4.1, "Procedures," because Entergy was not adequately maintaining procedures listed in RG 1.33, Revision 2, Appendix A, February 1978. Specifically, the inspectors identified several examples where Entergy staff inappropriately used Entergy procedure EN-OP-112, "Night and Standing Orders," to implement procedure changes instead of PNPS quality assurance procedure NOP98A1, "Procedure Process."

Description. On November 12, 2015, the inspectors identified five examples where Entergy inappropriately used the SO process, described in EN-OP-112, to implement procedure changes for procedures required by TS 5.4.1. PNPS quality assurance program procedure procedure NOP98A1, "Procedure Process," specifies the requirements for reviewing, approving, and implementing procedure changes for TS 5.4.1 procedures. EN-OP-112 also states that SOs shall not be used as a substitute for procedures or temporary procedure changes. NOP98A1 procedure development and review requirements include 50.59 and 50.54q(2) screening and reviews; change in intent reviews; time limits and level of use designations; and owner and concurrence reviews. The SO approval process only requires a single approver, Operations manager or designee signature. The inspectors determined that not complying with the NOP98A1 requirements was a performance deficiency. The multiple examples of this performance deficiency identified by the inspectors included the items listed below. Based on the number of examples identified, the inspectors concluded that Entergy routinely failed to perform procedure changes in accordance with quality assurance procedure NOP98A1.

- SO # 15-01: Provided operators supplementary instructions to take when transferring condensate demineralizer, Rad demineralizer, and Thermax polisher resin beds to the spent resin storage tank to prevent the tank from overflowing.
- SO# 15-02: Directed operators to manipulate the HPCI gland seal condenser blower controls when operating HPCI with a concurrent loss of instrument air.
- SO # 15-14: Directed operators to declare the shutdown transformer inoperable and take action in accordance with TS limiting condition for operation 3.9.B when the shutdown transformer was supplied by Line 71.
- SO # 15-16: Directed operators to proceed to cold shutdown if the probability was greater than 50 percent that sustained wind speeds will be above 75 mph on-site within the next 12 hours.
- SO # 14-10: Directed reactor engineering to calculate reactor thermal power MFLCPR using a corrected value of minimum critical power ratio operating limit when reactor power was stabilized in the range of 25 - 32.5 percent due to GE discovering that the calculation for minimum critical power ratio operating limit was incorrectly crediting automatic reactor feed pump trip at reactor water level of +60 inches.

Analysis. The inspectors determined that not implementing the procedure change process as described in PNPS procedure NOP98A1 was a performance deficiency that was reasonably within Entergy's ability to foresee and prevent. Specifically, Entergy staff used Entergy procedure EN-OP-112, "Night and Standing Orders," to implement procedural changes instead of using PNPS procedure NOP98A1, "Procedure Process." The performance deficiency was determined to be more than minor because if left uncorrected, the practice of utilizing the SO process as a substitute for procedure or



temporary procedure changes has the potential to lead to a more significant safety concern. Specifically, the inspectors determined the issue was similar to Example 4.a of IMC 0612, Appendix E, which states that an insignificant procedure error would be more than minor if the licensee routinely failed to adhere to the applicable procedure. The inspectors evaluated the finding using IMC 0609, Appendix 0609.04, "Initial Characterization of Findings," which directed the use of IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Using Exhibit 2, "Mitigating Systems Screening Questions," of IMC 0609, Appendix A, the inspectors determined this finding was not a design or qualification deficiency and would not lead to a potential or actual loss of system or safety functions. The inspectors also determined that the finding did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather initiating event, and did not involve the total loss of any safety function as identified in Exhibit 4, and is therefore of very low safety significance (Green).

The inspectors determined that this finding had a cross-cutting aspect in Problem Identification and Resolution, Resolution, because Entergy did not properly evaluate and develop effective corrective actions to address degraded equipment in a timely manner commensurate with their safety significance. Specifically, Pilgrim did not adhere to the CAP evaluation and corrective action program timeliness requirements that would have likely led them to use the appropriate procedure change process. [P.3]

Enforcement. TS Section 5.4.1, "Procedures," states: "Written procedures shall be established, implemented, and maintained covering the activities recommended in RG 1.33, Revision 2, Appendix A, February 1978." PNPS procedure NOP98A1, "Procedure Process," includes the requirements for maintaining TS required procedures. Contrary to this, between November 14, 2014, and November 12, 2015, Entergy did not implement the requirements of PNPS procedure NOP98A1 to maintain procedures affecting the operation of HPCI, the transfer of radioactive spent resin, the shutdown transformer, the calculation of core thermal power limits, and operator response to adverse weather. Because this finding was of very low safety significance (Green) and has been entered into the CAP as CR 2015-09233, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC's Enforcement Policy. **(NCV 05000293/2015004-02, Failure to Properly Implement Procedure Changes in accordance with TS 5.4.1a)**

40A3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 3 samples)

.1 (Closed) LER 05000293/2015-004-00: 480V Bus B6 Auto Transfer Function Degraded

a. Inspection Scope

The inspectors reviewed Entergy's actions and reportability criteria associated with LER 05000293/2015-004-00, which is addressed in CR 2015-3454, CR 2015-9580, and CR 2015-9762. On April 23, 2015, Entergy discovered the time delay relay 27A-BX1/TDDO had failed to close during scheduled calibration of the relay. The relay provides degraded voltage protection for the B6 480V bus. The B6 bus provides power to the LPCI system injection valves to the recirculation piping. The relay failure resulted in a condition prohibited by TS for the inoperability of LPCI greater than seven days and could have prevented the fulfillment of a safety function of an SSC needed to remove residual heat and mitigate the consequences of an accident. The performance

deficiency associated with this violation is discussed below. Corrective actions taken included immediately replacing the relay and performing an equipment apparent cause evaluation. This LER is closed.

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," when Entergy failed to determine the cause of an SCAQ. Specifically, a causal evaluation was not performed for a failed safety-related relay that ensured the automatic operation of the LPCI injection valves in a degraded voltage condition.

Description. On April 23, 2015, the unit was in a refueling outage and the calibration of Agastat relay 27A-B1X identified that a normally de-energized relay contact failed to close when the relay coil was energized. The relay's function is to transfer the B6 480V bus from the normal power source (B1 480V bus) to the alternate power source (B2 480V bus) during a degraded voltage condition. The B6 bus provides power to the LPCI motor operated injection valves, which require power to open during accident conditions. Under degraded voltage conditions (less than 92 percent but above 58 percent of normal rated voltage) the motor operated valves may not have had sufficient voltage to open. Therefore, with the degraded voltage relay failed, LPCI could not perform its function under all design conditions and was inoperable. Entergy replaced the failed relay and restored LPCI to an operable status on May 10, 2015.

As a failure identified during calibration, Entergy entered the issue into the CAP on April 23, 2015, as a 'C' level CR. A 'C' level condition is defined in EN-LI-102, "Corrective Action Program," as a "condition with low significance due to low risk, low actual or potential consequence. A cause evaluation is not required. Corrective actions are taken to correct the condition." The site replaced the relay and determined no additional actions were required. The failed relay was immediately discarded during the refueling outage, contrary to procedure EN-MA-101-02, "Control of Material Outside Facility Warehouse," and was not available for analysis. This procedure requires that non-conforming parts be segregated and tagged until dispositioned by engineering in accordance with EN-LI-102, "Corrective Action Program."

During the past operability and reportability review for the 'C' level CR, Entergy determined that LPCI was inoperable for greater than the allowed outage time and that a safety system functional failure had occurred, which made the issue reportable under 10 CFR 50.73. However, Entergy made no changes to the actions required to address this concern.

Inspectors determined through their review of the issue that LPCI being inoperable for two years was a SCAQ. As defined in Entergy procedure EN-LI-102, a SCAQ is a malfunction that adversely affects the safety-related functions of SSCs deemed significant based on actual or potential consequences to nuclear safety. In this case, with the relay failure, in a degraded voltage condition during a design basis accident, the automatic injection of LPCI could have been prevented due to insufficient power to the B6 bus. As a SCAQ, the inspectors concluded that in accordance with 10 CFR 50, Appendix B, Criterion XVI, Entergy was required to identify the cause of the failure and take correct action to preclude recurrence. In addition, Entergy procedure EN-LI-102 states that equipment failures that result in a loss of safety function should be an 'A' level

CR and events resulting in a LER or TS violation should be a 'B' level CR. Both 'A' and 'B' level CRs require a causal evaluation and extent of condition reviews.

The inspectors discussed the need for a causal evaluation and extent of condition review with the plant staff on July 6, 2015. In response, to restore compliance with the CAP, Entergy completed a 'B' level equipment apparent cause evaluation, which included an extent of condition review, on July 31, 2015.

The cause evaluation completed in response to the inspectors questions determined that since a cause could not be determined, because the relay was discarded, the failure was a single random failure. The inspectors questioned the basis for the single random failure conclusion documented in the cause evaluation and Entergy provided the following additional information that supported this conclusion:

- A review of past operating history identified no other failures for this make and model of relay at PNPS
- The relay was installed in the plant for 14 years, which was less than the vendor recommended lifetime for the relay
- A review of maintenance and calibration history for the relay did not identify indications of degradation and also determined that Entergy had complied with all vendor recommended calibration and testing frequencies

The inspectors also questioned the adequacy of the documented extent of condition for this failure. The results inappropriately relied upon a PNPS CAP search and a search for industry operating experience. Entergy procedure EN-LI-118, "Cause Evaluation Process," defines extent of condition as the extent to which the actual condition exists within other plant processes, equipment, and human performance. Based on this definition, the inspectors questioned if these relays were used in other locations in the plant that could be exposed to a similar failure mode. Entergy completed a review in response to this question and determined that the original extent of condition only reviewed six relays of the 48 Agastat 7000 series installed in the plant. The extent of condition was expanded to include an additional ten safety-related relays based on the failure mechanism observed during testing. The additional ten relays reviewed are designed with a time-delay drop out function, which is the function that failed in the 27A-B1X relay. No additional concerns were identified based on this review.

Entergy documented the inspector concerns regarding cause evaluation and extent of condition review in CR 2015-9762. Entergy documented the failure to retain the failed relay for additional analysis in CR 2015-9580.

Analysis. The inspectors determined that not identifying the cause or extent of condition for a SCAQ in accordance with the requirements of Entergy procedure EN-LI-102, "Corrective Action Program," was a performance deficiency reasonably within Entergy's ability to foresee and correct. Specifically, Entergy did not perform a causal evaluation to determine the cause of a relay failure that resulted in LPCI being declared inoperable for two years or identify the extent of condition for the failed relay until the inspectors raised questions regarding the relay failure. This finding is associated with the Mitigating System cornerstone attribute of equipment performance and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The failure to identify the cause and extent of condition of the relay failure as

directed by site procedures could result in repeat events which adversely affect safety system availability.

In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 2 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined that this finding was of very low safety significance (Green) because the finding did not involve the design of a mitigating SSC or a loss of function of a train or system for greater than the TS allowed outage time. The inspectors determined this finding has a cross-cutting aspect in Human Performance, Procedure Adherence, because individuals did not follow processes, procedures, and work instructions. Specifically, personnel did not recategorize the CR to a higher level requiring a causal evaluation, as required by EN-LI-102 when a LER was issued. The site also did not retain the failed safety-related part, as required by EN-MA-101-02. [H.8]

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that for a SCAQ, measures shall assure that the cause of the condition is determined and corrective actions taken to preclude recurrence. Contrary to this, on April 23, 2015, for a SCAQ associated with the LPCI system, Entergy did not assure that the cause of the condition was determined. Entergy entered the issue into the CAP as CR 2015-9762 and completed a causal evaluation that confirmed that the issue was a single random failure requiring no additional action to preclude recurrence. Because this violation is of very low safety significance (Green) and has been entered into Entergy's CAP as CR 2015-9762, this finding is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(05000293/2015004-03: Failure to Identify the Cause of a Significant Condition Adverse to Quality)**

.2 (Closed) LER 05000293/2015-006-00: Ultimate Heat Sink and Salt Service Water System Declared Inoperable

The inspectors reviewed Entergy's actions and reportability criteria associated with LER 05000293/2015-006-00, which is addressed in CR 2015-6987. On August 9, 2015, during a period of hot summer weather conditions, PNPS declared the ultimate heat sink and SSW systems inoperable due to exceeding the high sea water inlet temperature limit of 75°F. This was due to a combination of increased sea water surface temperature in Cape Cod bay and the contribution of recirculation water from the plants outfall due to wind and tidal conditions. Operators reduced power to restore sea water inlet temperature to the allowed levels. The inspectors reviewed the sequence of events and the operator and plant equipment response to the event. No performance deficiencies or violations were identified. Entergy's planned corrective actions include implementing a plant modification to lower the SSW loop temperature alarm setpoints and evaluating potential changes to the SSW system operating procedure to direct actions for the lower alarm setpoint and the rate of temperature increase. This LER is closed.

.3 (Closed) LER 05000293/2015-007-00: Single Main Steam Isolation Valve Closure Resulting in Automatic Reactor Scram

a. Inspection Scope

The inspectors reviewed Entergy's actions and reportability criteria associated with LER 05000293/2015-007-00, which is addressed in CR 2015-7285. On August 22, 2015, PNPS experienced a reactor scram due to an Average Power Range Monitor High Flux

signal following the closure of AO-203-1C (1C inboard MSIV). The cause of the event was determined to be inadequate worker practices resulting in an excessive load being applied to the unistrut enclosed pneumatic line (during or prior to 2001) causing it to lay on a Main Steam Line subject to vibration. The excessive load caused an initiating crack in the nipple threads that over time resulted in a shear of the line. Corrective actions that have been completed include replacing the pneumatic supply line nipple, supporting the line, and performing a leak check of all fittings to the inboard MSIVs. The inspectors assessed the accuracy of the LER, timeliness of corrective actions, and whether violations of requirements occurred. This LER is closed.

b. Findings

Introduction. A self-revealing Green NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified because Entergy did not use the correct work planning and design controls to repair the support for the nitrogen supply line for the 1C inboard MSIV. Specifically, inadequate design controls led to a failed horizontal unistrut support for the nitrogen supply line to the 1C MSIV, resulting in the header resting on the main steam line. This caused vibration-induced cyclic failure of the nitrogen supply line, closure of 1C MSIV, and a plant scram.

Description. On May 14, 2001, Entergy identified that the horizontal unistrut support for the 1C MSIV nitrogen supply line had failed, due to excessive load, and was no longer providing support for the line. The need for additional support for the nitrogen supply line was identified in Maintenance Request 01109717 in 2001, and a vertical unistrut support was added for the MSIV nitrogen supply line. This repair was insufficient to ensure that the pneumatic supply line was adequately supported. Failure of this repair resulted in the nitrogen supply line resting on the main steam line, and the eventual vibration-induced cyclic failure of the line. Because the 1C MSIV is normally maintained open by nitrogen pressure supplied by this line, the failure caused the closure of the 1C MSIV, and a reactor scram on August 22, 2015.

Upon further review of the issue, the inspectors determined that Entergy incorrectly classified and performed the work to install the vertical unistrut support as "minor maintenance", which is defined, in part, as repairs for hardware deficiencies that are easily corrected and do not affect the ability of a safety-related system to perform its intended function. The inspectors determined that a design change per Entergy procedure EN-DC-115, "Engineering Change Process," was more appropriate in this instance. EN-DC-115 states that a design change involves configuration changes to SSCs beyond the scope of engineering evaluations (i.e., equivalency evaluations). In this case, a configuration change to the nitrogen line support was required to ensure the function of the MSIV was maintained.

Entergy performed an immediate extent of condition review after the scram. The pneumatic lines to the other seven MSIVs and the four safety relief valves were verified to be properly supported. The damaged line was modified and repaired, using an additional unistrut for support as determined by the EN-DC-115 engineering change process. Entergy performed a root cause evaluation for this issue in CR 2015-7285.

Analysis. The inspectors determined that the failure to make repairs to the 1C MSIV nitrogen line support using the design change process in EN-DC-115, "Engineering Change Process," was a performance deficiency that was reasonably within Entergy's

ability to foresee and correct and should have been prevented. Specifically, had Entergy used the appropriate process for repair, the station would have ensured the pneumatic line was adequately supported and prevented the future failure of the pneumatic line. This finding is more than minor because it is associated with the Initiating Events cornerstone attribute of equipment performance and affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure of the pneumatic supply header support resulted in a plant scram due to the vibration induced cyclic failure of the nitrogen supply line and subsequent closure of 1C MSIV. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 1 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined that this finding was of very low safety significance (Green) because the finding did not involve the complete or partial loss of a support system that contributes to the likelihood of, or cause, an initiating event and affect mitigation equipment. The inspectors determined this finding does not have a cross-cutting aspect because the performance deficiency occurred in 2001 and is not indicative of current performance.

Enforcement. 10 CFR 50, Appendix B, Criterion III, "Design Control," requires, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, and that design control measures shall be applied to items such as maintenance and repair. Contrary to the above, on May 14, 2001, Entergy did not apply appropriate design control measures to a 1C MSIV nitrogen line unistrut support repair. The minor maintenance process that Entergy used to perform the repair did not verify or check the adequacy of the design. As a result, the inadequate support led to failure of the line, closure of the 1C MSIV, and subsequent reactor scram. Entergy performed a root cause evaluation, is in the process of updating procedures and processes to improve worker practices, and has performed inspections and repairs on the failed pneumatic supply header. Because this violation is of very low safety significance (Green) and has been entered into Entergy's CAP as CR 2015-07285, this finding is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(05000293/2015004-04: Inadequate Design Control of MSIV Nitrogen Supply Line Support leads to Scram)**

#### 4OA5 Other Activities

##### Repetitive Degraded Cornerstone Column (Column 4) Follow-Up Activities

###### Background

As described in the mid-cycle assessment letter, dated September 1, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15243A259), the NRC determined that performance at PNPS was in the Repetitive Degraded Cornerstone Column (Column 4) of the NRC's Action Matrix, following completion of the final significance determination of a White finding under the Mitigating Systems cornerstone. This final significance determination is referenced in a separate letter, also issued on September 1, 2015 (ADAMS Accession No. ML15230A217).

### Completed Activities

Regional NRC management conducted weekly teleconferences with PNPS's Recovery Manager to discuss the station's progress related to Column 4 recovery efforts. Additionally, regional management conducted multiple site visits to Pilgrim to meet with senior PNPS management, as well as to provide oversight for various inspections conducted during the fourth quarter, including the Inspection Procedure 95003 Phase 'A' inspection.

Inspectors conducted the Inspection Procedure 95003 Phase 'A' inspection from January 11–15, 2016. The purpose of this inspection was to review various aspects of the station's CAP to determine whether PNPS continues to operate safely and whether additional regulatory actions are required to arrest declining performance. The results of this inspection will be documented in a stand-alone inspection report, which will be issued on or before February 29, 2016.

The inspectors also completed three operations-focused problem identification and resolution samples in the fourth quarter of 2015. The results of these inspection samples are documented in Section 4OA2.6 of this inspection report.

### Planned Activities

As discussed in a Notification of Inspection letter issued on December 18, 2015 (ADAMS Accession No. ML15352A128), the NRC plans to conduct Inspection Procedure 95003 Phase 'B' at PNPS from April 4–8, 2016. This inspection will review overall CAP performance since the last problem identification and resolution inspection completed in August 2015, focusing on improvements made to the program as a result of Entergy's recovery efforts.

#### 4OA6 Meetings, Including Exit

On January 25, 2016, the inspectors presented the inspection results to Mr. John Dent, Site Vice President, and other members of the PNPS staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

## **ATTACHMENT: SUPPLEMENTARY INFORMATION**

**SUPPLEMENTARY INFORMATION****KEY POINTS OF CONTACT**Licensee Personnel

J. Dent, Site Vice President  
 S. Verrochi, General Manager of Plant Operations  
 G. Blackenbiller, Chemistry Manager  
 B. Chenard, Director of Engineering  
 K. Connerton, Senior Reactor Operator  
 J. Cotter, Operations Training Supervisor  
 J. Falconeri, Electrical Engineer  
 G. Flynn, Assistant Operations Manager  
 J. Gerety, System Engineering Manager  
 K. Gracia, Shift Manager M. Lynch, Engineering Response Supervisor  
 M. Jacobs, Nuclear Oversight Manager  
 M. Landry, Fire Protection Engineer  
 C. McMorrow, Fire Marshall  
 P. Miner, Licensing Engineer  
 R. Morris, EDG Engineer  
 A. Niederberger, Ventilation Engineer  
 D. Noyes, Director of Recovery  
 J. Ohrenberger, Maintenance Manager  
 B. O'Neil, Senior Reactor Operator  
 E. Perkins, Regulatory Assurance Manager  
 M. Romeo, Director of Regulatory Assurance and Performance  
 K. Sejkora, Sr HP/Chemist Specialist  
 J. Taylor, LORT Supervisor  
 J. Tucker, Senior Engineer  
 A. Zeile, Radiation Protection Manager

**LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED**Opened/Closed

05000293/2015004-01	NCV	Inadequate Implementation of Corrective Action following Winter Storm Juno (Section 4OA2)
05000293/2015004-02	NCV	Failure to Properly Implement Procedure Changes in accordance with TS 5.4.1a (Section 4OA2)
05000293/2015004-03	NCV	Failure to Identify the Cause of a Significant Condition Adverse to Quality (Section 4OA3)



05000293/2015004-04	NCV	Inadequate Design Control of MSIV Nitrogen Supply Line Support leads to Scram (Section 4OA3)
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Closed

05000293/2015-004-00	LER	480V Bus B6 Auto Transfer Function Degraded (Section 4OA3)
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05000293/2015-006-00	LER	Ultimate Heat Sink and Salt Service Water System Declared Inoperable (Section 4OA3)
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05000293/2015-007-00	LER	Single Main Steam Isolation Valve Closure Resulting in Automatic Reactor Scram (Section 4OA3)
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**LIST OF DOCUMENTS REVIEWED****Section 1R01: Adverse Weather Protection**Procedures

2.1.42, Operation During Severe Weather, Revision 28  
 2.1.37, Coastal Storm – Preparations and Actions, Revision 37  
 5.2.2, High Winds (Hurricane), Revision 39  
 EN-FAP-EP-010, Severe Weather Response, Revision 2  
 2.1.5, Controlled SD From Power, Revision 128  
 2.4.144, Degraded Voltage, Revision 44  
 2.1.14, Power Changes, Revision 113  
 2.1.42, Adverse Weather, Revision 28  
 8.C.40, Cold Weather Surveillance, Revision 33

Condition Reports

2015-0558	2015-0743	2015-9158
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Maintenance Orders/Work Orders

00401050	00378376
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Miscellaneous

ESOMS Narrative Log  
 On Line Risk Assessment for the Week of 9/27/15  
 EC 54453, EDG 'A' Room Temperature Indicators  
 EC 51182, EDG 'B' Room Temperature Indicators

**Section 1R04: Equipment Alignment**Procedures

2.2.146, Station Blackout Diesel Generator, Revision 44  
 2.2.50, Standby Gas Treatment, Revision 69

2.2.8, Standby AC Power Systems, Revision 111  
 2.2.146, Station Blackout Diesel Generator, Revision 44

Condition Reports

2014-6935

Drawings

M264, P&ID Station Blackout Diesel Generator Set, Revision 18  
 M219, Diesel Generator Air Start System, Revision 24  
 M223, Diesel Oil and Storage Transfer System, Revision 33  
 M259, Diesel Generator Turbo Air Assist System, Revision E10  
 M271, Diesel Generator Lube Oil System, Revision 6  
 M272, Diesel Generator Jacket Water System, Revision 9

**Section 1R05: Fire Protection**

Procedures

5.5.2, Special Fire Procedure, Attachment 11, Turbine Bldg. El. 51, Revision 52  
 EN-TQ-125, Fire Brigade Drills, Revision 3  
 EN-DC-161, Control of Combustibles, Revision 13  
 SEP-FPP-PNP-001, Fire Protection Plan, Revision 3  
 Fire Hazards Analysis, Engineering Evaluation 59, Acceptability of Penetration Configurations  
 1.3.135, Control of Doors, Revision 8  
 8.C.42, Sub compartment Barrier Control Surveillance, Revision 26

Condition Reports \*NRC Identified

2015-8273*	2015-8086	2015-8513
2014-6787	2015-8551	

Miscellaneous

Fire Hazards Analysis - Fire Area 1.9, Fire Zone 1.15, Standby Liquid Control Pumps & Equipment  
 High Energy Line Break (HELB) Barrier Analysis

**Section 1R06: Flood Protection Measures**

Procedures

1.3.135, Control of Doors, Revision 8  
 8.C.42, Sub compartment Barrier Control Surveillance, Revision 26

Condition Reports

2015-8863	2015-9539	2015-9575
2015-8864	2015-9567	2015-9596
2015-0906	2015-9576	2015-9595

Maintenance/Work Orders

52622888	52653340
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Miscellaneous

S & SA 171, PBOC Temperature and Pressure Profiles for 10" HPCI Line Breaks (PBOC-1, PBOC-3, and PBOC-3-BW) @ 1050 psia Reactor Dome Pressure, Revision 1  
S & SA 61, Flood Level Calculations, Revision 1

**Section 1R11: Licensed Operator Regualification Program**Procedures

2.4.16, Distribution Alignment Electrical System Malfunctions, Revision 43  
EOP-1, RPV Control, Revision 14  
EOP-3, Primary Containment Control, Revision 11  
EOP-17, Emergency RPV Depressurization, Revision 6

Condition Reports

2014-04055	2014-04889	2015-00570	2015-04425
2015-04756			

Job Performance Measures

200-34	201-15	205-11	212-04
229-01	262-06	262-16	262-17
264-08	290-03		

Comprehensive Written Exams (Previously administered in Aug/Sep 2014)

2014 LORT SRO-1	2014 LORT SRO-3	2014 LORT SRO-5
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Simulator Scenarios

2009-03	2010-04	2010-11	2014-03
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Simulator Testing

EN-TQ-202 Simulator Configuration Control, Revision 9

Miscellaneous

2015 LOR Annual Operating Exam Sample Plan  
ANSI/ANS-3.4-1983, Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants.  
ANSI/ANS-3.5-2009, Nuclear Power Plant Simulators for Use in Operator Training and Examination  
EN-TQ-114, LORT Program Description  
LORT/NRC Simulator Exam Scenario SES-174, Revision 1, dated 9/22/11  
PNPS 1.3.34, Operations Administrative Policies and Processes

**Section 1R12: Maintenance Effectiveness**Procedures

EN-DC-207, Maintenance Rule Periodic Assessment, Revision 3  
EN-DC-206, Maintenance Rule (a)(1) Process, Revision 3  
EN-DC-205, Maintenance Rule Monitoring, Revision 5

Condition Reports

2013-5346	2014-5349	2015-1670	2015-7601
2013-8114	2015-7596	2015-2339	2015-7596

2015-7600	2013-0825	2015-1520	2015-8077
2015-7601	2014-6664	2015-1983	2015-8644
2013-0378	2015-0561	2015-6039	

Miscellaneous

Maintenance Rule Periodic Assessment for Operating Cycle 20, dated 9/10/2015  
 NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Revision 4A  
 Regulatory Guide 1.160, Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Revision 3  
 Maintenance Rule Basis Document for the Main Steam system  
 Maintenance Rule (a)(1) action plan for the Main Steam system, Revision 10

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**Procedures

1.5.22, Risk Assessment Process, Revision 25  
 1.3.144, Maintenance Performance of Trip Sensitive Activities, Revision 2  
 8.M.2-2.1.10, 4160 Volt Emergency Buses A5 and A6 Loss of Voltage and Degraded Voltage Relays – Critical Maintenance, Revision 40  
 EN-MA-125, Troubleshooting Control of Maintenance Activities, Revision 18  
 2.2.108, Diesel Generator Cooling and Ventilation System, Revision 46

Condition Reports

2015-8300	2015-8309	2015-8793
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Maintenance/Work Orders

00426784	52648068	52648066
52648067	52648069	00428637

Miscellaneous

ESOMS LCO Tracker  
 ESOMS Narrative log  
 Equipment out of service Risk Assessment Tool  
 Protected Equipment List  
 Online Risk Assessment for the week of October 25, 2015  
 Online T-Week Report

**Section 1R15: Operability Determinations and Functionality Assessments**Condition Reports

2015-8476	2015-9253	2015-9490
2015-9377	2015-9493	2015-6772

Drawings

H29-1-9SG, Pipe Support SSWS, Revision E1  
 H29-1-10SG, Pipe Support SSWS, Revision E1  
 H29-1-X88, SSW Pipe Anchors at Intake Structure Vault Loop A, Revision E0  
 H29-1-1062, Pipe Support SSWS, Revision E1  
 M8636, Service Water Pumps P-208 A,B,C,D & E Discharge, Revision E3  
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EN-RP-203 Dose Assessment Attachment 9.5 - Dose Equivalent Worksheet for PCE # 2015-013, Slot # 1494, April 29, 2015

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2012-2304	2012-3801	2012-4816	2012-4884

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2013-0184	2013-0378	2013-0451	2013-0604
2013-0610	2013-0856	2013-0863	2013-0994
2013-2275	2013-2276	2013-3794	2013-3953
2013-4041	2013-4190	2013-4302	2013-4431
2013-4458	2013-5208	2013-5246	2013-5457
2013-5660	2013-5823	2013-5843	2013-6298
2014-0826	2014-1300	2014-1376	2014-1431
2014-4052	2014-5937	2014-6222	2015-0375
2015-0558	2015-1706	2015-1707	2015-1972
2015-2706	2015-2780	2015-3638	2015-3657
2015-3933	2015-4046	2015-4149	2015-4149
2015-4313	2015-4432	2015-4583	2015-4769
2015-5077	2015-5396	2015-5762	2015-6250
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Procedures

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 1.3.121, Problem Report Program, Revision 9  
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**LIST OF ACRONYMS**

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Documents Access and Management System
ALARA	as low as reasonably achievable
AOP	abnormal operating procedure
CAP	corrective action program
CR	condition report
DR	deficiency report
EAL	emergency action level
EDG	emergency diesel generator
EOP	emergency operating procedure
HPCI	high pressure coolant injection
IMC	Inspection Manual Chapter
JPM	job performance measure
LER	licensee event report
LOCA	loss of coolant accident
LOOP	loss of offsite power
LPCI	low pressure coolant injection
MSIV	main steam isolation valve
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission, U.S.
OOS	out of service
PI	performance indicator
PNPS	Pilgrim Nuclear Power Station
RCIC	reactor core isolation cooling
RG	Regulatory Guide
RP	radiation protection
SAG	Severe Accident Guideline
SCAQ	significant condition adverse to quality
SCBA	self-contained breathing apparatus
SO	standing order
SSC	structure, system, and component
SSW	salt service water
TS	technical specification
UFSAR	Updated Final Safety Analysis Report