**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**REGION I**
**2100 RENAISSANCE BOULEVARD, SUITE 100**
**KING OF PRUSSIA, PENNSLYVANIA 19406-2713**

February 14, 2018

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

SUBJECT: PILGRIM NUCLEAR POWER STATION – INTEGRATED INSPECTION REPORT 05000293/2017004

Dear Mr. Sullivan:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Pilgrim Nuclear Power Station (PNPS). On January 25, 2018, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

No NRC-identified or self-revealing findings were identified during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and the NRC Public Document Room in accordance with 10 *Code of Federal Regulations* (CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

***/RA/***

Anthony Dimitriadis, Chief
Reactor Projects Branch 5
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000293/2017004
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

SUBJECT: PILGRIM NUCLEAR POWER STATION – INTEGRATED INSPECTION REPORT 05000293/2017004 dated February 14, 2018

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**U.S. NUCLEAR REGULATORY COMMISSION**

REGION I

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|---|---|
| Docket No: | 50-293 |
| License No: | DPR-35 |
| Report No.: | 05000293/2017004 |
| Licensee: | Entergy Nuclear Operations, Inc. (Entergy) |
| Facility: | Pilgrim Nuclear Power Station (PNPS) |
| Location: | Plymouth, MA |
| Dates: | October 1, 2017 through December 31, 2017 |
| Inspectors: | E. Carfang, Senior Resident Inspector<br>P. Cataldo, Acting Senior Resident Inspector<br>J. Krafty, Acting Senior Resident Inspector<br>B. Pinson, Resident Inspector<br>P. Boguszewski, Project Engineer<br>J. Ambrosini, Senior Emergency Preparedness Inspector<br>B. Dionne, Health Physicist<br>D. Silk, Senior Operations Engineer<br>J. DeBoer, Emergency Preparedness Inspector<br>M. Orr, Reactor Inspector<br>J. Vazquez, Project Engineer<br>S. Elkhiamy, Reactor Inspector |
| Approved By: | Anthony Dimitriadis, Chief<br>Reactor Projects Branch 5<br>Division of Reactor Projects |

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## SUMMARY

IR 05000293/2017004; 10/01/2017 to 12/31/2017; PNPS; Routine Integrated Inspection Report

This report covered a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. No findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

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

No findings were identified.

## REPORT DETAILS

Summary of Plant Status

Pilgrim began the inspection period at 100 percent power. On October 24, 2017, operators reduced power to approximately 45 percent for a planned main condenser thermal backwash. Operators returned the unit to 100 percent on October 25, 2017 and remained at or near 100 percent power for the remainder of the inspection period. Documents reviewed for each section of this inspection report are listed in the Attachment.

## 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 cold temperatures. The review focused on the standby AC power system and diesel generator cooling and ventilation system. The inspectors reviewed the Final Safety Analysis Report (FSAR), technical specifications (TSs), control room logs, and the corrective action program (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.

b. Findings

No findings were identified.

.2 External Flooding

a. Inspection Scope

During the week of December 18, 2017, the inspectors performed an inspection of the external flood protection measures for PNPS. The inspectors reviewed procedures, design documents, and FSAR, Chapter 2.4.4, which depicted the design flood levels and protection areas containing safety-related equipment to identify areas that may be affected by external flooding. The inspectors conducted a walkdown of the retube room and turbine building truck bay and a general site walkdown of external areas of the plant to ensure that Entergy's flood protection measures were in accordance with design specifications. The inspectors inspected the watertight doors to confirm that they were being properly maintained. The inspectors also reviewed the results of the inspection of the seals on external penetrations below flood levels to determine if there was significant degradation. In addition, the inspectors reviewed operating procedures for mitigating external flooding during severe weather to confirm that, overall, Entergy had established

adequate measures to protect against external flooding events and, more specifically, that credited operator actions were adequate.

b. Findings

No findings were identified.

1R04 Equipment Alignment

Partial System Walkdowns (71111.04 – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- High pressure coolant injection (HPCI) walk down during reactor core isolation cooling (RCIC) system outage on November 1, 2017
- 'A' residual heat removal (RHR) during 'B' RHR maintenance on November 15, 2017
- Instrument air with temporary air compressor in service on November 16, 2017

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 FSAR, TSs, work orders (WOs), condition reports (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.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 5 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 out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Standby liquid control room on October 10, 2017

- 'A' RHR and core spray quadrant on October 30, 2017
- 'A' emergency diesel generator (EDG) room on October 30, 2017
- 'B' EDG room on October 30, 2017
- Radiation waste truck lock on October 30, 2017

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the site flooding analysis, and plant procedures to identify internal flooding susceptibilities for the site. The inspectors' review focused on the cable spreading room. The inspectors verified the adequacy of doors and the curbs around doors used to limit and control flooding. The inspectors reviewed the assumptions used in the flooding analysis to determine if they were reasonable, and assessed the adequacy of operator actions which Entergy identified as necessary to cope with flooding in this area.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance

.1 Quarterly Review of Licensed Operator Requalification Testing and Training (71111.11Q – 1 sample)

a. Inspection Scope

The inspectors observed licensed operator simulator training on October 23, 2017, which included a fire on the standby gas treatment (SBGT) system, a stuck open safety relief valve (SRV) and a failure to scram following hydraulic binding of control rods. The scenario required declaration of a general emergency. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. 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 (71111.11Q – 1 sample)

a. Inspection Scope

On October 2, 2017, the inspectors observed the lowering of power to 98 percent to unlock the 'A' reactor recirculation pump after a scoop tube lock out occurred. After the scoop tube was unlocked, power was returned to 100 percent. Inspectors observed the reactivity and pre-job brief to verify that the briefings met the criteria specified in Entergy's Procedure EN-OP-115, "Conduct of Operations," Revision 21. Additionally, the inspectors observed operator 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 Review of Licensed Operator Requalification Program (71111.11A, 71111.11B – 1 sample each)

a. Inspection Scope

The following inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 11, and Inspection Procedure Attachment 71111.11, "Licensed Operator Requalification Program."

Examination Results

On December 13, 2017, the results of the annual operating tests were reviewed to determine if pass/fail rates were consistent with the guidance of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 11, and NRC Inspection Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process." The review verified that the failure rate (individual or crew) did not exceed 20 percent.

- One out of 54 operators failed at least one section of the Annual Exam. The overall individual failure rate was 1.8 percent.
- Zero out of eight crews failed the simulator test. The crew failure rate was 0.0 percent.

Observations were made of the dynamic simulator exams and job performance measures (JPMs) administered during the week of September 25, 2017. These observations included facility evaluations of crew and individual performance during the dynamic simulator exams and individual performance of JPMs.

Written Examination Quality

The inspectors reviewed two written examinations administered during the 2016 examination cycle for qualitative and quantitative attributes as specified in Appendix B of Attachment 71111.11, "Licensed Operator Requalification." There was no written examination administered in 2017.

Operating Test Quality

Ten JPMs and six scenarios for the operating tests for the weeks of September 18 and September 25, 2017, were reviewed for qualitative and quantitative attributes as specified in Appendix C of 71111.11, “Licensed Operator Requalification Program.”

Licensee Administration of Operating Tests

Observations were made of the dynamic simulator exams and JPMs administered during the week of September 25, 2017. These observations included facility evaluations of crew and individual performance during the dynamic simulator exams and individual performance of JPMs.

Examination Security

The inspectors assessed whether facility staff properly safeguarded exam material. JPMs, scenarios, and written examinations were checked for excessive overlap of test items.

Remedial Training and Re-Examinations

No remediation plans or examinations were reviewed because there were no recent failures.

Conformance with Operator License Conditions

Medical records for nine senior reactor operator licenses and six reactor operator licenses were reviewed to assess conformance with license conditions. All records reviewed were satisfactory.

Proficiency watch standing records were reviewed for the second quarter of 2017. All active licensed operators met the watch standing requirements to maintain an active license.

The reactivation plan for three licensed operators were reviewed to assess the effectiveness of the reactivation process. The reactivations were processed in accordance with site procedures.

Records for the participation of licensed operators in the requalification program for 2017 were reviewed. Records for the performance of licensed operators on annual requalification operating test and biennial requalification written exams were reviewed.

Simulator Performance

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

Problem Identification and Resolution

A review was conducted of recent operating history documentation found in inspection reports, the licensee’s CAP, and the most recent NRC plant issues matrix. The

inspectors also reviewed specific events from the licensee's CAP which indicated possible training deficiencies to verify that they had been appropriately addressed. The senior resident inspector was also consulted for insights regarding licensed operators' performance. These reviews did not detect any operational events that were indicative of possible training deficiencies.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 3 samples)

a. Inspection Scope

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

- Neutron monitoring system the week of November 13, 2017
- Review of periodic maintenance effectiveness assessment for operating cycle 21 the week of December 18, 2017
- Reactor building closed loop cooling water system the week of December 18, 2017

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.

- Elevated risk during 'B' EDG planned maintenance the week of October 9, 2017
- Elevated risk with RCIC planned maintenance on November 1, 2017
- Elevated risk during RCIC planned maintenance on November 15, 2017
- Elevated risk during a planned A8 bus outage on November 30, 2017

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 4 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:

- HPCI low oil level on September 28, 2017
- Dual indication on 'A' RHR primary containment isolation valve on October 4, 2017
- Damper position alarm on 'B' EDG on October 11, 2017
- Recirculation pump speed limiter deviation from FSAR values on November 15, 2017

The inspectors evaluated the technical adequacy of the operability determinations to assess whether technical specification 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 FSAR 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, the inspectors determined whether the measures in place would function as intended and were properly controlled by Entergy.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 3 samples)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed the piping modifications to accommodate the temporary air compressor implemented by EC 74577. The inspectors evaluated 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 field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

b. Findings

No findings were identified.

.2 Permanent Modifications

a. Inspection Scope

The inspectors evaluated the following modifications implemented by engineering changes. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the design change, including the implementation work activities, design drawing revisions, and the post-modification test plan. Additionally, the inspectors reviewed applicable failure modes analyses and associated corrective action documents to verify other similarly-affected valves were appropriately identified.

- EC 74553, Control Circuit Changes to MO-1001-36A
- EC 62735, Motor Operated Controller (MOC) Design Upgrade with Sealed Potentiometer for EDG

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 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 point were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

- Station blackout diesel generator oil transfer pump level switch replacement on October 3, 2017
- ‘A’ RHR thermocouple replacement and diagnostic testing on October 6, 2017
- ‘B’ EDG MOC replacement on October 11, 2017
- Recirculation pump power supply replacement on October 15, 2017
- Traversing incore probe repairs on October 20, 2017
- ‘A’ salt service water pump balancing as a result of high vibration on November 2, 2017

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 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 FSAR, 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:

- 8.5.5.8, RCIC overspeed trip test on September 27, 2017
- 8.M.2-1.5.3.4, Primary containment isolation logic channel test, channel B2, on October 19, 2017
- 8.7.4.4, Main steam isolation valve operability on October 24, 2017 (in-service test)
- 8.E.13, RCIC system instrument calibration on November 1, 2017
- 8.M.2-2.10.4.3, HPCI simulated automatic actuation on November 7, 2017

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP2 Alert and Notification System Evaluation (71114.02 – 1 sample)

a. Inspection Scope

The inspectors conducted an onsite review to assess the maintenance and testing of the Pilgrim alert and notification system (ANS). During this inspection, the inspectors reviewed the Pilgrim siren system and backup route alerting, and the associated ANS procedures and the Federal Emergency Management Agency ANS Design Report to ensure compliance with design report commitments for system maintenance and testing.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization Staffing and Augmentation System (71114.03 – 1 sample)

a. Inspection Scope

The inspectors conducted a review of the Pilgrim Emergency Response Organization (ERO) augmentation staffing requirements and the process for notifying and augmenting the ERO to verify the readiness of key staff to respond to an emergency event and to verify their ability to activate their emergency response facilities in a timely manner. The inspectors reviewed: the Pilgrim Emergency Plan for facility activation and ERO staffing requirements, the ERO duty roster, applicable station procedures, augmentation test reports, call-in drill reports, and corrective action reports related to this inspection area.

The inspectors also reviewed a sample of ERO responder training records to verify training and qualifications were up to date.

b. Findings

No findings were identified.

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

a. Inspection Scope

Entergy implemented various changes to the Pilgrim Emergency Action Levels (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 Part 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 listed in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings were identified.

1EP5 Maintaining Emergency Preparedness (71114.05 – 1 sample)

a. Inspection Scope

The inspectors evaluated the efficacy of efforts to maintain the Pilgrim emergency preparedness program. The inspectors reviewed: memoranda of agreement with offsite agencies; procedures for the 10 CFR 50.54(q) Emergency Plan change process; Pilgrim's maintenance of equipment important to emergency preparedness; records of evacuation time estimate population evaluation; and provisions for, and implementation of, primary, backup, and alternative emergency response facility maintenance. The inspectors also verified compliance with NRC regulations regarding: emergency action levels for hostile action events, protective actions for on-site personnel during events, emergency declaration timeliness, ERO augmentation and alternate facility capability, evacuation time estimate updates, on-shift ERO staffing analysis, and ANS back-up means.

The inspectors further evaluated the ability to maintain Pilgrim's emergency preparedness program through their identification and correction of weaknesses, by reviewing a sample of drill reports, self-assessments, condition reports, and 10 CFR 50.54(t) reviews since the last NRC emergency preparedness program inspection in March 2015.

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 routine Entergy emergency drills on October 23, 2017 and November 7, 2017, to identify any potential weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and emergency operations facility to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by Entergy staff in order to evaluate Entergy's 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: Public Radiation Safety**

2RS2 Occupational As Low As Is Reasonably Achievable Planning and Controls (71124.02 – 1 sample)

a. Inspection Scope

The inspectors assessed Entergy's performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used the requirements contained in 10 CFR 20, applicable Regulatory Guides (RGs), TSs, and procedures required by TSs as criteria for determining compliance.

Implementation of ALARA and Radiological Work Control

The inspectors reviewed radiological work controls and ALARA practices during the observation of in-plant work activities. The inspectors reviewed the results achieved against the intended ALARA estimates to confirm adequate implementation and oversight of radiological work controls. The inspectors also verified that post job reviews were performed for the refueling outage jobs and the lessons learned were captured in the Entergy CAP.

b. Findings

No findings were identified.

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

a. Inspection Scope

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, TSs, and procedures required by TSs as criteria for determining compliance.

Self-Contained Breathing Apparatus (SCBA) for Emergency Use

The inspectors reviewed the following: the status and surveillance records for three SCBAs staged in-plant for use during emergencies; Entergy's 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 of this equipment.

b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index (2 samples)

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, 2016 through September 30, 2017:

- Emergency alternating current power system
- Cooling water tower

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 system 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 Emergency Preparedness Performance Indicator (3 samples)

a. Inspection Scope

The inspectors reviewed data for the Pilgrim emergency preparedness PIs: (1) Drill and Exercise Performance (EP01); (2) ERO Drill Participation (EP02); and (3) ANS Reliability

(EP03). The inspectors conducted the last NRC emergency preparedness inspection at Pilgrim in the fourth calendar quarter of 2016, so the inspectors reviewed supporting documentation from emergency preparedness drills and tests from the fourth calendar quarter of 2016 through the third calendar quarter of 2017, to verify the accuracy of the reported PI data. The inspectors conducted this review in accordance with NRC Inspection Procedure 71151, using the acceptance criteria documented in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 7.

b. Findings

No findings were identified.

.3 Occupational Exposure Control Effectiveness (1 sample)

a. Inspection Scope

The inspectors reviewed licensee submittals for the occupational radiological occurrences PI for the fourth quarter of 2016 through the first, second and third quarters of 2017. The inspectors used PI definitions and guidance contained in the 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.

b. Findings

No findings were identified.

.4 Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual (TS/ODCM) Radiological Effluent Occurrences (1 sample)

a. Inspection Scope

The inspectors reviewed licensee submittals for the radiological effluent TS/ODCM radiological effluent occurrences PI for the fourth quarter of 2016 through the first, second and third quarters of 2017. The inspectors used PI definitions and guidance contained in the 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 indicator results were accurately reported.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 4 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 condition report 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.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

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 department trend reports, system health reports and MR assessments. The inspectors evaluated a sample of condition reports generated over the course of the past two quarters by departments that provide input to the quarterly trend reports with a focus on operations, maintenance and engineering. The inspectors also reviewed Entergy's CAP database for the third and fourth quarters of 2017 to assess condition reports written in various subject areas, as well as individual issues identified during the NRC's daily condition repot review (Section 4OA2.1). The inspectors reviewed Entergy's quarterly Department Performance Review Meeting and Aggregate Performance Review Meeting reports completed during the third quarter of 2017, conducted under EN-LI-121, "Trending and Performance Review Process," 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.

The inspectors determined that the issues were appropriately evaluated by Entergy staff for trends and that identified trends were input into the CAP and appropriately evaluated.

The inspectors also noted that Entergy's interim effectiveness reviews, which were intended to review progress of corrective actions taken to address the human performance issues that led to the March 31, 2017, torus fill event, determined that the actions taken to date were not fully effective. This was based on four additional low

consequence events that involved inadequate operator fundamentals and poor procedure use and adherence in the third and fourth quarters of 2107. In response, Entergy has initiated benchmarking targeting specific crew inadequacies and additional focused operating crew assessments that use a senior reactor operator to perform focused observations of the operating crews.

.3 Annual Sample: Spent Fuel Pool Boraflex Degradation

a. Inspection Scope

The inspectors reviewed Entergy's corrective actions taken to address non-cited violation 05000293/2017001-03, Untimely Corrective Actions associated with Boraflex degradation in the Spent Fuel Pool. Specifically, the NRC had previously determined that Entergy had not established corrective actions to ensure that the SFP configuration would meet analysis-established limitations beyond September 2017. Following up on this issue, the inspectors reviewed corrective actions, subsequently developed by Entergy, to ensure that that these actions were adequately developed and implemented to maintain the SFP was maintained in a safe configuration.

Inspectors reviewed updated operability determinations, a root cause evaluation, updated fuel move sheets for fuel moves taking place in 2017, revised fuel handling procedures, and documentation of the current SFP configuration. The current SFP configuration was assessed to ensure conformance with Entergy's criticality evaluation of record and compliance with station procedures. Inspectors also verified fuel assembly positions via a sample-based review of video recordings. Inspectors discussed with Entergy staff the reasoning behind the current SFP configuration and the fuel moves performed to ensure that implemented corrective actions were based on conservative assumptions. The inspectors assessed the prioritization and timeliness of Entergy's corrective actions to determine whether Entergy's completed and planned corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Entergy's CAP and 10 CFR Part 50, Appendix B

b. Findings and Observations

No findings were identified.

After the NRC's previous inspection of this issue documented in NRC IR 050002932017001 (ML17136A015), Entergy rearranged the fuel in the SFP to ensure subcriticality could be maintained within regulatory limits beyond September 2017. This rearrangement was intended to ensure the SFP would remain subcritical only as a result of the spatial separation of the fissile material in the fuel, and not rely on the neutron absorption provided by the Boraflex panels. The inspectors' reviewed the vendor's analysis of the new spent fuel configuration and independently verified the final locations of a risk-informed sample of spent fuel cells after Entergy completed the required fuel moves. Based on these reviews the inspectors concluded that that the new configuration provided reasonable assurance that the SFP would be maintained in a safe condition, without further reconfiguration, as long as additional fuel is not added to the pool.

Inspectors noted two examples of Entergy staff demonstrating effective and proactive conservative decision-making practices. In one instance, Entergy staff had a more detailed evaluation performed that determined that the SFP configuration would meet the analysis-established limitations until November 2017 – as opposed to the initially

established September 2017 date – in case there were unexpected delays in completing the necessary fuel moves. Nevertheless, the fuel moves and associated configuration verification were completed on August 24, 2017. In another instance, cells adjacent to the initially-discovered degraded panel were maintained empty or blocked, despite the fact that fuel storage in these cells would have been permissible in accordance with the criticality analysis of record.

Additional details regarding the NRC's ongoing review of the licensee event report associated with this issue (LER 05000293/2016-003-02, Spent Fuel Storage Design Feature Exceeded) can be found in Section 4OA3 of this inspection report.

.4 Annual Sample: Maintenance Rule and Preventive Maintenance Program Improvement Plan Development and Implementation

a. Inspection Scope

The inspectors performed an in-depth review of Entergy's improvement plans to the MR and preventive maintenance (PM) programs. Specifically, the review focused on corrective actions associated with CR 2016-05555, which included Entergy's apparent cause evaluation for MR program implementation discrepancies. The inspectors also reviewed Entergy's corrective actions associated with CR 2016-09147, stemming from Entergy's PM program self-assessment to improve its maintenance strategies and address SSC wear, performance, reliability, and the effects of equipment aging.

The inspectors reviewed Entergy's apparent cause evaluation associated with MR program problems identified and its self-assessment to understand the scope of the issues. This inspection focused on the tracking, prioritization, completion, and timeliness of Entergy's corrective actions resulting from these reviews to determine whether Entergy was appropriately correcting problems consistent with its potential safety significance, Entergy's CAP procedures and the requirements in 10 CFR Part 50, Appendix B. In addition, the inspectors interviewed engineering personnel to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

The inspectors determined that Entergy staff identified two apparent causes to the MR program implementation discrepancies involving inadequate management oversight and dedicated resources to ensure successful implementation of the MR program. Entergy staff further identified contributing causes in four areas: change management during previous program transitions, rigor applied and maintained regarding MR documentation, MR related qualification requirements, and MR program oversight by engineering management. The inspectors concluded the evaluation scope appeared sufficient to identify the problems and reasonably support corrective action development.

With respect to the PM program, the inspectors determined Entergy identified implementation problems related to PM processes and procedures that could impact reliable equipment performance and ensure compliance with regulatory requirements (10 CFR 50.65). Entergy entered these issues into its CAP on March 24, 2016 (CR 2016-02056 and CR 2016-02061). Entergy staff developed a project plan to improve its PM program implementation. The plan included addressing component PM strategy deficiencies, improving the quality and technical rigor of PM program engineering

products, and ensuring adequate PM strategies existed for critical station equipment. For critical station equipment where PM deficiencies were identified during its focused self-assessment, Entergy staff evaluated whether the equipment was vulnerable to failure due to the deficient or missing PMs, and developed and tracked mitigation actions as required. For equipment that was not specifically evaluated during the self-assessment, Entergy staff performed a risk-based review of PM recommendations to identify whether program vulnerabilities existed.

The inspectors reviewed the prioritization, tracking, and completion of corrective actions and confirmed that timeliness of the corrective actions were commensurate with the potential safety significance of the issues. In cases where due dates were extended, the inspectors verified that extensions received the appropriate review in accordance with Entergy's corrective action procedure and that appropriate interim and/or compensatory measures were implemented to minimize the problem or mitigate the effects until permanent actions could be completed.

The corrective actions to address the MR program implementation were tracked under CR-2016-05555. The inspectors reviewed corrective action priority and compensatory actions and determined they were appropriate. In particular, one corrective action related to ensuring the quality of maintenance rule functional failure (MRFF) determinations included compensatory measures to require the management review committee to review all MRFF evaluations until the MRFF coordinator refresher training was completed. The inspectors reviewed additional specific corrective actions, including the development of a database for MR scoped systems and a program notebook for centralized program information, the development of an MR Coordinator qualification card, and the training and qualification of engineers from different departments to ensure qualified back-ups. Finally, the inspectors noted that Entergy was tracking and providing oversight for the overall completion of the MR program improvement plan. The inspectors concluded Entergy's planned actions in these areas were reasonable.

.5 Annual Sample: Technical Specifications Surveillance Requirements Implementation

a. Inspection Scope

The inspectors reviewed recent instances where technical specification surveillance tests were performed outside of the license requirements included in the TSs. Specifically, inspectors reviewed CRs, causal evaluations, and other documents associated with two recent instances in which either TS requirements were not implemented as written, or the functions of safety related equipment were affected due to improper implementation of the requirements.

The inspectors reviewed the details of Entergy's discovery that it was not complying with TS requirements for control room habitability testing. Specifically, from November 2008 until October 2016 the Pilgrim control room envelope was not pressure tested in accordance with the TS requirements.

The inspectors also reviewed the fact that Entergy operators had performed a refueling outage surveillance test while at 97 percent power, which inappropriately removed the safety function of the SBGT system, and rendered the secondary containment system inoperable. This occurrence was previously discussed in NRC Inspection Report 05000293/2017002 (ML17226A015).

The inspectors performed in-depth reviews of Entergy's evaluations, extent of condition, and associated corrective actions to ensure that the causes were understood and appropriate corrective actions were established. Additionally, the inspectors interviewed Entergy personnel involved in the causal evaluations.

b. Findings and Observations

No findings were identified.

The inspectors determined that Entergy's evaluations and extent of condition reviews were thorough, and the causes were appropriately identified. The inspectors also determined that the corrective actions were reasonable, timely, and addressed the concerns with improper implementation of TS requirements.

Inspectors reviewed the adverse condition analysis (ACA) associated with CR 2016-7901, "Control Room Envelope Test," and determined that the identified causal factors, the planned and taken corrective actions, and the extent of condition were adequate.

Inspectors also reviewed the root cause evaluation (RCE) associated with CR 2017-2900, which investigated the April 2017 occurrence of the SBGT system being made unavailable for surveillance testing. Inspectors determined that the root cause, causal factors, planned and taken corrective actions, extent of condition, and extent of cause were adequate. Corrective actions to address the identified causes in the RCE included providing additional training to staff related to the implementation of TS requirements, procedure changes, and implementation of a more thorough review of upcoming work activities to ensure tasks involving safety-related equipment are performed in accordance with all license requirements.

Specifically, guidance was developed to ensure that technical specification surveillance tests, in-service inspections and in-service tests are completed in the correct mode of operation, completed at the correct frequency interval, satisfies all licensing basis requirements, and are completed without electively defeating a safety function that is required at the time of the test. Inspectors did not identify any issues in subsequent tests following implementation of the associated corrective actions. However, inspectors did note that Entergy staff identified, as part of the more thorough reviews, that an upcoming SBGT system test would have made both trains of the SBGT system inoperable had the test been performed as written. CRs 2017-11714 and 2017-12306 were written to document the issue, and CR 2017-2900 was revised to implement additional corrective actions as a result.

In conclusion, inspectors determined that Entergy's causal evaluations, assessments, corrective actions, extents of condition and extents of cause were effective in identifying and correcting the associated TS surveillance requirements implementation issues.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 2 samples)

.1 (Closed) Licensee Event Report (LER) 05000293/2017-005-00: 10 CFR 50, Appendix J, Option B, Leak Rate Criteria Exceeded

On April 10, 2017, the personnel airlock, X-2, failed to meet local leak rate test (LLRT) acceptance criteria of 0.05 $L_a$ during the as-found LLRT, and on April 22, 2017, two HPCI turbine exhaust check valves failed to meet LLRT acceptance criteria. The HPCI turbine check valve test failure was dispositioned in NRC inspection report

05000293/2017003 (ML17319A158), this LER assessment addresses the X-2 airlock LLRT failure. The inspectors' review of the test results determined that although the leak rate of the inner personnel airlock door exceeded the overall surveillance test acceptance criteria of 10.525 standard liters per minute, the outer personnel airlock door remained operable, and containment integrity was maintained consistent with TSs. In addition, the licensee determined that the cause of the personnel airlock leak test failure was the air lock pressure equalizing device (PED) sealing O-rings. During testing, the pressure was applied from outside the drywell, which is opposite of expected design basis conditions. This test method caused the PED to open, which caused O-ring extrusion and leakage through the airlock. During an actual event, increased post-accident pressures inside the drywell would tend to seal the inner door and its associated PED. Acceptable leakage values during testing ensure consistency with applicable TS and design basis requirements. Because the testing verified the outer door had maintained containment integrity, which ensured TS requirements were met, no violations were identified. The inspectors did not identify any new issues during the review of this LER. This LER is closed.

.2 (Closed) LER 05000293/2017-007-00: Potential Inoperability of Safety Relief Valve 3A

On April 24, 2017, following replacement of a pilot valve for safety-relief valve SV203-3A, electrical resistance testing of the associated solenoid circuit identified high resistance values greater than the acceptance criteria. Pilgrim staff entered the issue into the CAP, replaced the solenoid, and the solenoid was sent to a vendor for failure analysis. The inspectors reviewed the RCE, the failure analysis from Altran, as well as the independent review conducted by Exponent, Inc. The inspectors determined that reasonable engineering testing methodologies were utilized for the failure analyses, and that the results support the identified cause of the high resistance to be corrosion internal to the crimped connections for the solenoid coils. The underlying performance issue associated with the internal corrosion build-up was previously dispositioned in NRC inspection report 05000293/2017003 (ML17319A158). The inspectors did not identify any new issues during the review of this LER. This LER is closed.

.3 (Discussed) LER 05000293/2016-003-00, 2016-003-01, 2016-003-02: Spent Fuel Storage Design Feature Exceeded

In May 2016, Entergy identified degraded conditions on a Boraflex panel in the Pilgrim spent fuel pool (SFP). Further assessment of the conditions also led Entergy to determine that the current Technical Specification 4.3.1.1.a, which allows loading a fuel assembly with k-infinity as high as 1.32, may be non-conservative for racks with Boraflex panels. If a fuel bundle with a k-infinity of 1.32 were to be introduced into one of the locations affected by Boraflex degradation in the SFP, this could potentially challenge the capability of maintaining the overall criticality of the pool (k-effective) below the limit of 0.95, established by Pilgrim Technical Specifications.

NRC Administrative Letter 98-10 states that the discovery of an inadequate (e.g. non-conservative) Technical Specification value is to be considered a degraded or nonconforming condition, and that prompt corrective action to correct or resolve the condition must be taken in accordance with 10 CFR Part 50, Appendix B. The NRC expects that, following the imposition of administrative controls to address any associated safety concerns, an amendment to the Technical Specification will be submitted in a timely fashion.

Inspectors reviewed Entergy's completed corrective actions to address the non-conservative k-infinity value currently listed in the technical specifications through the implementation of administrative controls. Entergy implemented administrative controls by revising the Pilgrim fuel handling procedure. The procedure established limits on the fuel assemblies that could be placed into the region of the spent fuel pool affected by Boraflex degradation based on the fuel burnup characteristics of each fuel assembly. Fuel assemblies with higher criticality levels (i.e. higher k-infinity fuel) are to be placed in regions of the pool that rely on material other than Boraflex (i.e. boral or metamic) for neutron absorption. The revised procedure also requires additional verification by a qualified reviewer to ensure that the fuel is positioned with adequate spacing between bundles to maintain the overall criticality (k-effective) of the SFP below the 0.95 limit. The inspectors determined that these administrative controls were adequate to maintain the SFP in a safe condition.

Furthermore, the inspectors reviewed Entergy's planned corrective actions to obtain a revised criticality safety analysis and submit an associated license amendment request. The revised criticality analysis is complex and unique for boiling water reactor SFPs, and will, therefore, require considerable time to complete. The criticality analysis is necessary to provide sufficient basis for the amendment request. The inspectors concluded that these actions, once completed, should be sufficient to resolve the non-conservatism in the technical specification, in accordance with Administrative Letter 98-10.

The NRC will continue review of this issue to verify the adequate and timely development and submission of Entergy's planned amendment request and to ensure that Entergy continues to maintain the safe configuration of the SFP. Until the planned amendment request is submitted, the issue of a non-conservative technical specification cannot be considered fully resolved. Therefore, this LER remains open, pending further NRC review.

Additional details regarding the NRC's evaluation of corrective actions taken by Entergy to address a previously identified safety concern associated with the SFP (NCV 05000293/2017001-03, Untimely Corrective Actions associated with Boraflex degradation in the Spent Fuel Pool) can be found in Section 4OA2 of this inspection report.

4OA6 Meetings, Including Exit

On January 25, 2018, the inspectors presented the inspection results to Mr. Brian Sullivan, Site Vice President, and other members of the Entergy 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

B. Sullivan, Site Vice President
R. Pitts, General Plant Manager
G. Blankenbiller, Chemistry Manager
L. Brown, Site Medical Staff
D. Calabrese, Emergency Preparedness Manager
S. Callis, Regulatory Assurance
K. Connerton, Senior Reactor Operator
J. Falconieri, EFIN Engineer
D. Grimes, Design Engineer
H. Grimes, Engineering Supervisor
E. Herbert, I&C Superintendent
G. James, Senior Reactor Engineer
K. Kampschneider, Electrical Engineer
D. Lecuye, Operations Training Instructor
A. Madeiras, NSSS Engineering Supervisor
R. Miller, Performance Improvement
P. Miner, Licensing Engineer
R. Morris, Mechanical Engineering
L. Pepple, Radiation Protection Supervisor
E. Perkins, Manager, Regulatory Assurance
M. Powers, Licensing Specialist
M. Riffle, Chemistry Supervisor
F. Russell, PM Engineer
P. Smith, Operations Support
R. Swanson, Maintenance Rule Coordinator
J. Taylor, Superintendent Operations Training
M. Williams, Licensing Specialist
J. Whalley, Shift Manager
S. Wogos, Assistant Engineering Director
K. Woods, Engineering Supervisor
G. Zavard, Radiation Protection Supervisor
A. Zelie, Radiation Protection Manager

## LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Closed

| | | |
|---|---|---|
| 05000293/2017-005-00 | LER | 10 CFR 50, Appendix J, Option B, Leak Rate Criteria Exceeded (Section 4OA3.1) |
| 05000293/2017-007-00 | LER | Potential Inoperability of Safety Relief Valve 3A (Section 4OA3.2) |

Discussed

| | | |
|---|---|---|
| 05000293/2016-003-00, 2016-003-01, 2016-003-02 | LER | Spent Fuel Storage Design Feature Exceeded (Section 4OA3.3) |

## LIST OF DOCUMENTS REVIEWED

### Section 1R01: Adverse Weather Protection

Procedures
2.2.8, Standby AC Power System (Diesel Generators), Revision 119
2.2.108, Diesel Generator Cooling and Ventilation System, Revision 48
2.4.167, Flooding, Revision 2
5.2.2, High Winds (Hurricane), Revision 40
8.C.40, Seasonal Weather Surveillance, Revision 43
8.C.42, Subcompartment Barrier Control Surveillance, Revision 30

Condition Reports
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Maintenance Orders/Work Orders
488368

Miscellaneous
C232, Turbine Building Shield Wall Plug Details, Revision 0
ENTCORP19-RPT-001, Pilgrim Nuclear Power Station Flooding Walkdown Summary in Response to 50.54(F) Information Request Regarding NTTF Recommendation 2.3, Revision 0
PNPS-CS-12-00002, Pilgrim Nuclear Power Station Flooding Walkdown Submittal Report for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Flooding, Revision 0
TDBD-109, Topical Design Basis Document for Internal and External Flooding, Revision 0

### Section 1R04: Equipment Alignment

Procedures
1.17.1, Potential Seismic Interaction Hazards, Revision 14
2.2.19, Residual Heat Removal, Revision 113
2.2.21, High Pressure Injection System (HPCI), Revision 85
8.C.24, Operations Equipment Lube Surveillance, Revision 96

Condition Reports
2016-3780 2017-9683 2017-11587

Miscellaneous
Calculation C15.0.3391, Seismic Interaction Calculation for Lead Shielding, Revision 0

Drawings
M220 SH 1, P&ID Compressed Air System, Revision 78
M220 SH 2, P&ID Compressed Air System, Revision 37
M243, PI&D HPCI System, Revision 55
M244, SH1, HPCI System Piping and Instrumentation Diagram, Revision 31
M244, SH2, HPCI Turbine Lube and Control Oil Subsystems, Revision 10
Pilgrim House Drawing, High Pressure Coolant Injection System

**Section 1R05: Fire Protection**

Procedures
5.5.2, Special Fire Procedure, Revision 56
5.5.2, Attachment 17, Radwaste Truck Lock El. 23, Revision 57
5.5.2, Attachment 21, Diesel Generator Building El. 23, Revision 57
EN-DC-161, Control of Combustibles, Revision 17

Miscellaneous
Fire Hazards Analysis – Fire Area 1.9, Fire Zone 1.1, 'A' RHR and CS Pumps Quadrant
Fire Hazards Analysis – Fire Area 1.9, Fire Zone 1.15, Standby Liquid Control Pumps & Equipment
Fire Protection Evaluation 37, Electrical Boxes Generic, Revision 4
PNPS SI-FP.1002B-19, Barrier No. 198.506 Radwaste Corridor, Revision 0

Drawings
A317 SH1, Reactor and Turbine Building Floor Plan At Elevation 23' Fire Barrier System, Revision 59
M249, Standby Liquid Control, Revision 29

**Section 1R06: Flood Protection Measures**

Procedures
2.4.167, Flooding, Revision 2
ARP-C7R, Alarm Response Procedure, Revision 22

Miscellaneous
M-736, Evaluation of the Fire Protection Piping for Seismic Class II/I Concerns, Revision 0
M1374, Internal Flooding Calculation with Safe Shutdown Evaluation for the PNPS Turbine, RX Aux, EDG, Radwaste, Intake, Offgas & Main Stack Buildings, Revision 0
TDBD-109, Topical Design Basis Document for Internal and External Flooding, Revision 0

**Section 1R11: Licensed Operator Requalification Program**

Procedures
1.3.34, Operations Administrative Policies and Process, Revision 152
2.1.14, Station Power Changes, Revision 115
2.2.84, Reactor Recirculation System, Revision 112
2.4.17, Recirculation Pump(s) Trip, Revision 47
2.4.19, Recirculation Pump MG Set Scoop Tube Lockup, Revision 29
8.9.1, EDG and Associated Emergency Bus Surveillance, Revision 144
EN-TQ-114, Licensed Operator Requalification Training Program Description, Revision 10

EN-TQ-210, Conduct of Simulator Training, Revision 10
OT-8, Operating Training Department Work Instruction, “Simulator Evaluation Guidelines”, Revision 21
TQF-201-IM05, Remedial Training Plan, Revision 9

Condition Reports
2015-07787 2015-08073 2016-03226 2016-06447 2016-06635 2016-07224
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2017-05692 2017-05746

Simulator-Related Test Documents
16-002, Manual Scram on High Reactor Level, Event Date 09/06/2016
17-001, Rapid Power Reduction due to Chloride Intrusion, Event Date 2/6/17
EN-OP-200, Plant Transient Response Rules, Revision 3
T.5 – Steady State Verification Testing at 50%, Date Tested 9/28/17
T.5 – Steady State Verification Testing at 80%, Date Tested 7/3/17
T.5 – Steady State Verification Testing at 100%, Date Tested 6/30/17
T.8 – CERT 1-1.TST – Manual Scram (Via pushbutton), Date Tested 5/23/2017
T.8 – CERT 3-4. TST – ATWS at 100% RTP with Failure of ARI to Initiate, Date Tested 5/23/2017
T.8 – CERT 1-2. TST – Simultaneous Trip of All Reactor Feed Pumps, Date Tested 5/25/2017
T.8 – CERT 3-3. TST – MSIV Closure with SORV and No HP ECCS Injection, Date Tested 5/18/2017

Miscellaneous
2016 LORT Biennial Exam Test #3 RO
2016 LORT Biennial Exam Test #3 SRO

**Section 1R12: Maintenance Effectiveness**

Procedures
EN-DC-204, Maintenance Rule Scope and Basis, Revision 4
EN-DC-205, Maintenance Rule Monitoring, Revision 6
EN-DC-206, Maintenance Effectiveness of Neutron Monitoring Instrumentation, Revision 3
EN-DC-207, Maintenance Rule Periodic Assessment, Revision 3

Condition Reports
2016-0018 2016-0976 2016-1036 2016-1812 2016-5289 2017-1010
2017-10164 2017-10204 2017-10797 2017-4555 2017-7400 2017-8352

Maintenance Orders/Work Orders
437846 438802

Miscellaneous
10 CFR50.65 Maintenance Rule Scoping Basis Document for Neutron Monitoring Instrumentation, Revision 4
Maintenance Rule (a)(1) Action Plan- Pilgrim Station, Revision 0
MRBD30A, RBCCW System 30A, Revision 4
Pilgrim Periodic Maintenance Effectiveness Assessment A Requirement of 10CFR50.65 (a)(3) Operating Cycle 21

System Health Report Power Range Neutron Monitoring, dated November 2017

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

Procedures
EN-OM-132, Nuclear Risk Management Process, Revision 0
EN-OP-102, Protective and Caution Tagging, Revision 20
EN-OP-119, Protected Equipment Postings, Revision 8
EN-WM-104, Online Risk Assessment, Revisions 15 and 16

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

Procedures
2.2.19.1, Residual Hear Removal System – Shutdown Cooling Mode of Operation, Revision 43
8.5.2.6, RHR Motor-Operated Valve Operability from Alternate Shutdown Panel, Revision 29
8.C.24, Operations Equipment Lube Surveillance, Revision 96
8.M.2-1.5.6, RWCU Valves Inboard and Outboard Relay Logic Test – Critical Maintenance, Revision 31
EN-OP-104, Operability Determination Process, Revision 14

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| 2017-9925 | 2017-10143 | 2017-12050 | 2017-12051 | 2017-12152 | 2017-12366 |

Maintenance Orders/Work Orders
486089 486601

Miscellaneous
257HA465AB, Revision 3
257HA465AB, Revision 4
EC 30944, DG Room Damper Modifications, Revision 0
ELNRC1.2.90.049, Updated Summary of Compliance with Regulatory Guide 1.97, Revision 3
PDC 94-35
Updated Final Safety Analysis Report, Revision 30
V2098, Terry Turbine Maintenance Guide, HPCI Application, Revision 4

Drawings
E5004, Electrical Schematic Diagram, Containment Spray Motor Operated Valves, Revision 13
E5021, Electrical Schematic Diagram Reactor Water Cleanup System Isolation Valve, Revision E10
M1N39-13 Sheet 1, Elementary Diagram Primary Containment Isolation System, Revision E20
M241 SH 1, Residual Heat Removal System, Revision 88
M244 SH 2, HPCI System Turbine Lube and Control Oil Subsystem, Revision 2

**Section 1R18: Plant Modifications**

Procedures
3.M.3-51, Electrical Termination Procedure, Revision 31
EN-DC-115, Engineering Change Process, Revision 9

Condition Reports
2017-10877 2017-11073

Maintenance Orders/Work Orders
415142 434551 487100

Miscellaneous
0099-0051-CGAP-001, MPR Commercial Grade Item/Service Acceptance Plan, Revision 0
0099-0051-EE-001, Pilgrim Space Motor Operated Controllers, Revision 1 Instruction Manual For Motor Operated Control, Revision A
CGI-EVAL-005, Basler Electric Motor Operated Controls Commercial Grade Evaluation, Revision 10
ECs 62735, 74577, 74246, 74553

Drawings
E8-31-4, SH 15, Wiring Diagram & Schematic Comb FVR Sizes 1, 2, 3, and 4, Revision 3
E5004, Electrical Schematic Diagram Containment Spray Motor Operated Valves, Revision 14
E217, SH 77, Connection Diagram 480V MCC B17-7 Bkrs B1771, B1773, B1774, B1766, Revision 10
M1H39, SH 17, Elementary Diagram Residual Heat Removal System, Revision 16
M6-45-6, Wiring Diagram Diesel Generator 'B' C102 Automatic Voltage Control, Revision 7
M220, SH 1, P&ID Compressed Air System, Revision 78
M220, SH 2, P&ID Compressed Air System, Revision 37

**Section 1R19: Post-Maintenance Testing**

Procedures
3.M.1-15, Vibration Monitoring For Preventive Maintenance And Balancing, Revision 56
3.M.2-5.6.4, TIP Guide Tube Friction Test, Revision 22
3.M.3-51, Electrical Termination Procedure, Revision 31
8.5.2.2.1, LPCI LOOP 'A' Operability, Revision 62
8.5.2.6, RHR Motor Operated Valve Operability from Alternate Shutdown Panel, Revision 29
8.5.3.2.1, Salt Service Water Pump Quarterly And Biennial (Comprehensive) Operability And
8.5.3.2.1, Salt Service Water Pump Quarterly And Biennial (Comprehensive) Operability And Valve Operability Tests, Revision 35
8.9.16.1, Manually Start and Load Blackout Diesel Via the Shutdown Transformer, Revision 54
8.M.2-2.10.2-3, RHR System High Drywell Pressure Auto-Initiation Trip System 'A', Revision 26
9.6, TIP System Operational Checkout, Revision 28
8.9.1, Emergency Diesel Generator and Associated Emergency Bus Surveillance, Revision 144
EN-DC-115, Engineering Change Process, Revision 9
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## LIST OF ACRONYMS

| | |
|---|---|
| ACA | adverse condition analysis |
| ADAMS | Agencywide Documents Access and Management System |
| ALARA | as low as reasonably achievable |
| ANS | alert and notification system |
| CAP | corrective action program |
| CFR | *Code of Federal Regulations* |
| CR | condition report |
| EAL | emergency action level |
| EDG | emergency diesel generator |
| ERO | Emergency Response Organization |
| FSAR | Final Safety Analysis Report |
| HPCI | high pressure coolant injection |
| JPM | job performance measure |
| LER | Licensee Event Report |
| LLRT | local leak rate test |
| MOC | motor operated controller |
| MR | Maintenance Rule |
| MRFF | Maintenance Rule Functional Failure |
| NEI | Nuclear Energy Institute |
| NRC | Nuclear Regulatory Commission |
| PED | pressure equalizing device |
| PI | performance indicator |
| PM | preventive maintenance |
| PNPS | Pilgrim Nuclear Power Station |
| PU&A | procedure use and adherence |
| RCE | root cause evaluation |
| RCIC | reactor core isolation cooling |
| RG | Regulatory Guide |
| RHR | residual heat removal |
| SBGT | standby gas treatment |
| SCBA | self-contained breathing apparatus |
| SFP | spent fuel pool |
| SSC | structure, system or component |
| SRV | safety relief valve |
| TS | technical specifications |
| ODCM | offsite dose calculation manual |
| WO | work order |