

June 23, 2000

Mr. Robert M. Bellamy  
Site Vice President  
Entergy Nuclear Generation Company  
Pilgrim Nuclear Power Station  
600 Rocky Hill Road  
Plymouth, Massachusetts 02360-5599

SUBJECT: NRC's PILGRIM INSPECTION REPORT NO. 05000293/2000-003

Dear Mr. Bellamy:

On May 20, 2000, the NRC completed an inspection at your Pilgrim reactor facility. The enclosed report presents the results of that inspection. The results were discussed on June 15, 2000, with Mr. R. Bellamy and other members of your staff.

This inspection was an examination of 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. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel. No findings were identified during the inspections.

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Sincerely,

/RA/

Robert Summers, Acting Chief  
Projects Branch 6  
Division of Reactor Projects

Docket No.: 05000293  
License No.: DPR-35

Enclosure: Inspection Report 05000293/2000-003

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Robert M. Bellamy

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REGION I

Docket No: 50-293  
License No: DPR-35  
Report No: 05000293/2000-003  
Licensee: Entergy Nuclear Generation Company  
Facility: Pilgrim Nuclear Power Station  
Location: 600 Rocky Hill Road  
Plymouth, MA 02360  
Inspection Period: April 2, 2000, through May 20, 2000  
Inspectors: R. Laura, Senior Resident Inspector  
R. Arrighi, Resident Inspector  
J. Furia, Senior Health Physicist  
Approved By: Robert Summers, Acting Chief  
Projects Branch 6  
Division of Reactor Projects

## SUMMARY OF FINDINGS

### Pilgrim Nuclear Power Station NRC Inspection Report 05000293/2000-003

The report covers a 7-week period of resident inspection. In addition, the report includes an announced inspection by a regional radiation specialist. The significance of issues is indicated by their color (green, white, yellow, or red) and was determined by the Significance Determination Process in draft Inspection Manual Chapter 0609 (see Attachment 1).

1. There were no findings identified during this inspection.

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## Report Details

### **SUMMARY OF PLANT STATUS**

Pilgrim Nuclear Power Station operated at 100 percent power for the entire report period.

#### **1. REACTOR SAFETY (Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity)**

##### 1R04 Equipment Alignment

###### a. Inspection Scope

The inspector performed a walkdown of the "A" emergency diesel (EDG) air start system during planned maintenance on the "B" EDG train system. The inspection verified that the redundant EDG train was operable and that the system was properly aligned to support normal and emergency plant operation.

###### b. Issues and Findings

There were no findings identified and documented during this inspection.

##### 1R05 Fire Inspection

###### a. Inspection scope

The inspector focused on fire protection equipment during tours of the reactor building, auxiliary bay, diesel rooms and the intake structure. The inspection consisted of fire protection system valve line-up and the material condition of fire hoses and fire extinguishers. The fire protection system engineer accompanied the inspector during portions of the tour.

The inspector also monitored the performance of the fire brigade training drill conducted on May 11, 2000, to observe fire brigade personnel performance, and verify that the licensee pre-planned drill scenario was followed and that the drill objectives were met.

###### b. Issues and Findings

There were no findings identified and documented during this inspection.

##### 1R06 Flood Protection Measures

###### a. Inspection Scope

The inspector conducted a walkdown inspection of the reactor building and auxiliary bays to assess the effectiveness for internal flood control measures. Two licensee engineering personnel accompanied the inspector during the inspection. The Updated Final Safety Analysis Report (UFSAR) and Pilgrim Safety Evaluation Report (SER) 50-84, "Internal Flooding Analysis," were reviewed prior to the field walk down. Special

emphasis was placed on the flooding controls for the high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) rooms due to the risk significance of those systems.

Items selected for review during the walkdown included watertight piping penetrations, watertight doors, floor level alarms and floor sump systems including the sump pumps, limit switches and valve line-ups. Also, passive equipment such as curbing and drains on each elevation of the reactor building were inspected. Lastly, the auxiliary bay floor drain to the torus room trough was inspected. The grating for the drain was free of foreign debris to prevent possible clogging.

b. Issues and Findings

There were no findings identified and documented during this inspection.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspector observed a licensee simulator training session that assessed an operating crew's use of emergency operating procedures (EOPs) to mitigate the consequences of a postulated accident. The intent of this training was for routine performance monitoring with participation by the operations department manager who observed the scenario and provided feedback at the end of the scenario. The criteria used by the inspector was proper use of the emergency operating procedures and also successful completion of critical tasks listed in the specific training scenario package. At the end of the scenario, the lead senior reactor operator (SRO) led a self assessment review of performance.

b. Issues and Findings

There were no findings identified and documented during this inspection .

1R12 Maintenance Rule

a. Inspection Scope

The inspectors reviewed the implementation of the maintenance rule as related to the following:

- a. Proper classification of equipment failures in the salt service water system as documented in the problem reporting system from April 1999 to April 2000. The inspector reviewed Problem Reports (PRs) 99.9454, 99.9564, 00.9111, and 00.1517.
- b. Proper classification, reporting and corrective actions for the random failure of the HPCI power supply inverter that occurred during this period. The inspector reviewed PR 00.9165 and Maintenance Request (MR) 10000993 which documented, evaluated and developed corrective actions to address the HPCI inverter failure.



b. Issues and Findings

There were no findings identified and documented during this inspection.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the risk assessment associated with the following activities:

- c. Emergent work of the "B" reactor building close loop cooling water system heat exchanger due to fouling
- d. Planned surveillance test on the emergency bus undervoltage relays A5/A6

The criteria used by the inspector was contained in licensee Procedure No. 1.5.22, Risk Assessment Process.

b. Issues and Findings

There were no findings identified and documented during this inspection.

1R15 Operability Evaluations

a. Inspection Scope

Two risk significant operability evaluations were selected for review to verify that continued operability was justified.

The first operability evaluation involved the emergency core cooling system (ECCS) pump suction strainers and resultant effect on the net positive suction head (NPSH) margin. This was documented in problem report PR 98.9582 and reviewed in engineering evaluation (EE) 98-094, revision 1.

The second operability evaluation involved the degraded air start system on the "A" emergency diesel generator (EDG).

b. Issues and Findings

There were no findings identified and documented during this inspection.

### 1R16 Operator Workarounds

#### a. Inspection Scope

The inspector reviewed the operator work-around list, operator logs, and instrument panel status to evaluate potential impacts on the operators' ability to implement abnormal or emergency operating procedures. One long standing work around reviewed by the inspector was the reactor building closed cooling water system temperature control valve controller (TIC-3835) which did not operate effectively in the automatic mode of operation. The new integrated and risk management manager indicated that corrective measures were being planned for later in 2000.

#### b. Issues and Findings

No findings were identified and documented during this inspection.

### 1R19 Post Maintenance Testing

#### a. Inspection Scope

The inspector reviewed and observed portions of the post maintenance test for the "A" emergency diesel generator (EDG) air start motors per test procedure TP00-002 following maintenance request (MR) 19902803. The purpose of the MR was to replace the M2 bank of the air start motors for the "A" EDG with a new design (from air vane motors to turbine air motors).

#### b. Issues and Findings

No findings were identified and documented during this inspection.

### 1R22 Surveillance Testing

#### a. Inspection Scope

The inspector reviewed the following surveillance tests:

- a. 8.5.2.3 "LPCI System Loop A Pump and Valve Quarterly Operability"
- a. 8.5.3.1 "RBCCW Pump Operability and Flow Rate Tests"
- b. 8.M.1-20 "High Water Level Scram Discharge Tank Instrumentation Functional Test"

The inspector verified that the system requirements were correctly incorporated into the test procedures and that the test acceptance criteria were consistent with the technical specifications an Updated Final Safety Analysis Report requirements. The review also included an evaluation of the completed surveillance test data to verify that the selected systems and components were capable of performing their intended safety functions and operational readiness.

b. Issues and Findings

There were no findings identified and documented during this inspection.

**2. RADIATION SAFETY**  
**Cornerstone: Occupational Radiation Safety**

2OS1 Access Control

a. Inspection Scope

The inspector reviewed the access control program by examining the controls established for three exposure significant areas, including postings, markings, control of access, dosimetry, surveys and alarm set points. Areas selected were located throughout the radiologically controlled area (RCA), including the turbine, augmented off-gas and reactor buildings.

Job performance observations were conducted to evaluate radiation worker performance with respect to stated radiation protection work requirements. This also included verification of radiological controls, such as adequacy of surveys and radiation protection technician coverage.

b. Issues and Findings

There were no findings identified and documented during this inspection.

2OS2 ALARA Planning and Controls

a. Inspection Scope

The inspector reviewed work performance during the current operating cycle. Areas reviewed included an evaluation of the use of engineering controls to achieve dose reductions; review of the use of low dose waiting areas; review of on-job supervision provided to workers; and, a review of individual exposures from selected work groups. An evaluation of engineering controls utilized to achieve dose reductions, and analysis of licensee source term reduction plans was also conducted.

Observations of radiation worker and radiation protection technician performance during high dose rate and/or high exposure jobs were conducted to determine if the training/skill level was sufficient with respect to the radiological hazards. Additionally, reviews were conducted to examine the assumptions and basis for the various job estimates, including the methodology utilized for estimating job-specific exposures.

b. Issues and Findings

There were no findings identified and documented during this inspection.

2OS3 Radiation Monitoring Instrumentation

a. Inspection Scope

The inspector reviewed the licensee's inventory of survey instruments, personnel contamination monitors and whole body counters and its program for daily source checking, maintenance and repair. This included walkdowns of the radiological instrumentation calibration and repair facility and instrument issue areas.

b. Issues and Findings

There were no findings identified and documented during this inspection.

**4. OTHER ACTIVITIES [OA]**

4OA1 Performance Indicator Verification

a. Inspection Scope

The inspector reviewed operator logs, NRC inspection reports, licensee event reports and monthly operating reports for the period of January 1999 to April 2000 to determine the accuracy and completeness for the reported Pilgrim performance indicators (PIs). The following PIs were reviewed:

- c. Unplanned Scrams per 7,000 Critical Hours
- d. Scrams with Loss of Normal Heat Removal
- e. Unplanned Power Changes per 7,000 Critical Hours

b. Issues and Findings

A review of plant data revealed that the licensee did not include the July 29, 1999, unplanned power reduction due to a problem with the "A" third point feed water heater in the unplanned power change PI. Operators lowered power from 100 percent to approximately 75 percent power in response to this event. The licensee generated problem report PR 00.1005 in response to the inspectors concern. A change to the PI data for unplanned power changes to account for the missed event would not result in a change of color (green) for this PI.

The inspector questioned the licensee regarding the March 27, 1999, unplanned power change. A planned power reduction was performed to allow for a condenser backwash. While at 60 percent power, the licensee identified that one of the main steam isolation valves (MSIVs) failed its slow closure test and the MSIV was declared inoperable. As a result of this condition, the licensee was limited in restoring power to 80 percent; thereby resulting in an unplanned overall decrease of 20 percent power. The licensee included

this event in the unplanned power change PI. Discussions with NRR revealed that due to the order of power decrease and increase, this event would not be required to be reported in accordance with the present guidance despite the intent of the PI to capture these types of events. NRR plans to provide clarification to the PI guidance to eliminate any ambiguity.

#### 4OA4 Cross-cutting Issues

##### Human Performance Problems

###### a. Inspection Scope

The inspector reviewed maintenance activity MR 19902803 that replaced the M2 bank of air start motors for the "A" emergency diesel generator with a new design. The air start motors were replaced in accordance with plant design change PDC 00-12.

###### b. Issues and Findings

There were no findings identified and documented during this inspection.

While implementing the work plan/modification to the "A" EDG air start motor, a maintenance technician identified an error in the design for the new air start motors. The fuel rack booster air connection was depicted as being installed in the wrong location. Had this installation occurred as designed, the fuel rack would be maintained in the 50 percent position, which would have caused an EDG over-speed condition on start demand. The work order was changed to reflect the proper design and a problem report (PR) 00.0943 was written.

Since the design change was not implemented with the error, this condition did not affect the EDG (mitigating system). In addition, had the technician not detected the problem, the error would have been revealed during the post maintenance test (PMT) and would not have resulted in damage to the EDG since the diesel would have automatically tripped on engine over-speed.

Inadequacy in engineering modifications has been a recurring theme since the last refueling outage 12 (May 8, 1999, through July 13, 1999) and is considered a cross-cutting issue under the new NRC oversight program. This issue was identified by the licensee during an engineering self-assessment and documented in PR 99.2988.

#### 4OA5 Management Meetings

###### a. Exit Meeting Summary

The inspectors presented the inspection results to Mr. R. Bellamy, VP Operations, and other members of licensee management at the conclusion of the inspection on June 15, 2000. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered propriety. No propriety information was identified.



**ITEMS OPENED, CLOSED, AND DISCUSSED**

None

**LIST OF ACRONYMS USED**

ALARA	As Low As is Reasonably Achievable
CFR	Code of Federal Regulations
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EE	Engineering Evaluation
EOP	Emergency Operating Procedure
HPCI	High Pressure Coolant Injection
LPCI	Low Pressure Coolant Injection
MSIV	Main Steam Isolation Valve
MR	Maintenance Request
NPSH	Net Positive Suction Head
PMT	Post Maintenance Test
PR	Problem Report
RBCCW	Reactor Building Closed Cooling Water
RCA	Radiologically Controlled Area
RCIC	Reactor Core Isolation Cooling
SER	Safety Evaluation Report
SRO	Senior Reactor Operator
UFSAR	Updated Final Safety Analysis Report

## ATTACHMENT 1

### NRC’s REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting safety performance at NRC licensed plants.

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

- | <b>Reactor Safety</b>  | <b>Radiation Safety</b>  | <b>Safeguards</b>   |
|--|--|---|
| <ul style="list-style-type: none"> <li>● Initiating Events</li> <li>● Mitigating Systems</li> <li>● Barrier Integrity</li> <li>● Emergency Preparedness</li> </ul> | <ul style="list-style-type: none"> <li>● Occupational</li> <li>● Public</li> </ul> | <ul style="list-style-type: none"> <li>● Physical Protection</li> </ul> |

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And



RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.