

March 3, 1987

Docket No. 50-293
Mr. James M. Lydon
Chief Operating Officer
Boston Edison Company
800 Roylston Street
Boston, Massachusetts 02199

Dear Mr. Lydon:

SUBJECT: ANALOG TRIP SYSTEM (TAC 60936)

Re: Pilgrim Nuclear Power Station

The Commission has issued the enclosed Amendment No. 99 to Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station. This amendment is in response to your application dated February 27, 1986, as corrected October 20, 1986.

The amendment changes the technical specification requirements for certain instrument channel test and calibration frequencies to once per operating cycle during refueling outages. These changes are associated with the installation of an electronic analog trip system. By letter dated October 20, 1986, you informed the NRC that because of the extended outage related to the April 1986 shutdown, Refueling Outage 7 has been incorporated into the current outage and requested that this license amendment be issued not earlier than January 15, 1987. You also referred to the inadvertent omission of the reference to note 4 of technical specifications Table 4.1.1 regarding "High Water Level in Scram Discharge Tanks" functional test column. This amendment also corrects this omission.

A copy of our related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notices.

Sincerely,

Original signed by

Rajender Auluck, Project Manager
BWR Project Directorate #1
Division of BWR Licensing

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PDR ADOCK 05000293
P PDR

Enclosures:

1. Amendment No. 99 to License No. DPR-35
2. Safety Evaluation

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See next page

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PAGE FOR
CONCURRENCE

Docket No. 50-293

Mr. William D. Harrington
Senior Vice President, Nuclear
Boston Edison Company
800 Boylston Street
Boston, Massachusetts 02199

Dear Mr. Harrington:

SUBJECT: ANALOG TRIP SYSTEM (TAC 60936)

Re: Pilgrim Nuclear Power Station

The Commission has issued the enclosed Amendment No. [redacted] to Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station. This amendment is in response to your application dated February 27, 1986.

The amendment changes the technical specification requirements for certain instrument channel test and calibration frequencies to once per operating cycle during refueling outages. These changes are associated with the installation of an electronic analog trip system. This amendment also requires an associated instrument check daily to verify transmitter output.

A copy of our related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notices.

Sincerely,

John A. Zwolinski, Director
BWR Project Directorate #1
Division of BWR Licensing

Enclosures:

- 1. Amendment No. [redacted] to License No. DPR-35
- 2. Safety Evaluation

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CJamerson
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PLeech
5/21/86

OELD
Dr. Karman
5/28/86

DBL:PD#1
JZwolinski
/ /

Mr. James M. Lydon
Boston Edison Company

Pilgrim Nuclear Power Station

cc:
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

BOSTON EDISON COMPANY

DOCKET NO. 50-293

PILGRIM NUCLEAR POWER STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.
License No. DPR-35

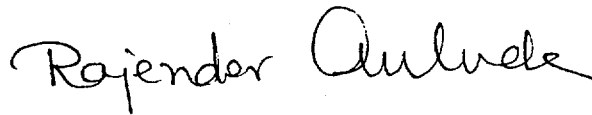
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Boston Edison Company (the licensee) dated February 27, 1986, as corrected October 20, 1986, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-35 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 99, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective 30 days after the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Rajender Auluck, Project Manager
BWR Project Directorate #1
Division of BWR Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 3, 1987

ATTACHMENT TO LICENSE AMENDMENT NO. 99

FACILITY OPERATING LICENSE NO. DPR-35

DOCKET NO. 50-293

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change.

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TABLE 4.1.1
 REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENTATION FUNCTIONAL TESTS
 MINIMUM FUNCTIONAL TEST FREQUENCIES FOR SAFETY INSTR. AND CONTROL CIRCUITS

	Group (2)	Functional Test	Minimum Frequency (3)
Mode Switch in Shutdown	A	Place Mode Switch in Shutdown	Each Refueling Outage
Manual Scram	A	Trip Channel and Alarm	Every 3 Months
RPS Channel Test Switch (5)	A	Trip Channel and Alarm	Each Refueling Outage
IRM			
High Flux	C	Trip Channel and Alarm (4)	Once Per Week During Refueling and Before Each Startup
Inoperative	C	Trip Channel and Alarm	Once Per Week During Refueling and Before Each Startup
APRM			
High Flux	B	Trip Output Relays (4)	Once/Week (7)
Inoperative	B	Trip Output Relays (4)	Once/Week
Downscale	B	Trip Output Relays (4)	Once/Week
Flow Bias	B	Calibrate Flow Bias Signal	Once/Month (1)
High Flux (15%)	B	Trip Output Relays (4)	Once Per Week During Refueling and Before Each Startup
High Reactor Pressure	D	Trip Channel and Alarm (4)	(1)
High Drywell Pressure	D	Trip Channel and Alarm (4)	(1)
Reactor Low Water Level (6)	D	Trip Channel and Alarm (4)	(1)
High Water Level in Scram Discharge Tanks	D	Trip Channel and Alarm (4)	Every 3 Months
Turbine Condenser Low Vacuum	D	Trip Channel and Alarm (4)	(1)
Main Steam Line High Radiation	B	Trip Channel and Alarm (4)	Once/Week
Main Steam Line Isolation Valve Closure	A	Trip Channel and Alarm	(1)
Turbine Control Valve Fast Closure	A	Trip Channel and Alarm	(1)
Turbine First Stage Pressure Permissive	D	Trip Channel and Alarm (4)	Every 3 Months
Turbine Stop Valve Closure	A	Trip Channel and Alarm	(1)
Reactor Pressure Permissive	D	Trip Channel and Alarm (4)	Every 3 Months

TABLE 4.1.2
 REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENT CALIBRATION
 MINIMUM CALIBRATION FREQUENCIES FOR REACTOR PROTECTION INSTRUMENT CHANNELS

Instrument Channel	Group (1)	Calibration Test (5)	Minimum Frequency (2)
IRM High Flux	C	Comparison to APRM on Controlled Shutdowns Full Calibration	Note (4) Once/operating cycle
APRM High Flux Output Signal	B	Heat Balance	Once every 3 Days
Flow Bias Signal	B	Internal Power and Flow Test	Each Refueling Outage
LPRM Signal	B	TIP System Traverse	Every 1000 Effective Full Power Hours
High Reactor Pressure	D	Note (7)	Note (7)
High Drywell Pressure	D	Note (7)	Note (7)
Reactor Low Water Level	D	Note (7)	Note (7)
High Water Level in Scram Discharge Tanks	D	Note (7)	Note (7)
Turbine Condenser Low Vacuum	D	Note (7)	Note (7)
Main Steam Line Isolation Valve Closure	A	Note (6)	Note (6)
Main Steam Line High Radiation	B	Standard Current Source (3)	Every 3 Months
Turbine First Stage Pressure Permissive	D	Note (7)	Note (7)
Turbine Control Valve Fast Closure	A	Standard Pressure Source	Every 3 Months
Turbine Stop Valve Closure	A	Note (6)	Note (6)
Reactor Pressure Permissive	D	Note (7)	Note (7)

NOTES FOR TABLE 4.1.2

1. A description of four groups is included in the bases of this Specification.
2. Calibration tests are not required when the systems are not required to be operable or are tripped.
3. The current source provides an instrument channel alignment. Calibration using a radiation source shall be made each refueling outage.
4. Maximum frequency required is once per week.
5. Response time is not a part of the routine instrument channel test, but will be checked once per operating cycle.
6. Physical inspection and actuation of these position switches will be performed during the refueling outages.
7. Calibration of these devices will be performed during refueling outages.

To verify transmitter output, a daily instrument check will be performed. Calibration of the associated analog trip units will be performed concurrent with functional testing as specified in Table 4.1.1.

3.1 BASES (Cont'd)

to perform its function adequately.

A source range monitor (SRM) system is also provided to supply additional neutron level information during start-up but has no scram functions. Ref. Section 7.5.4 FSAR. The APRM's cover the "Refuel" and "Startup/ Hot Standby" modes with the APRM 15% scram, and the power range with the flow biased rod block and scram. The IRM's provide additional protection in the "Refuel" and "Startup/Hot Standby" modes. Thus, the IRM and APRM 15% scram are required in the "Refuel" and "Startup/Hot Standby" modes. In the power range the APRM system provides the required protection. Ref. Section 7.5.7 FSAR. Thus, the IRM system is not required in the "Run" mode.

The high reactor pressure, high drywell pressure, reactor low water level and scram discharge volume high level scrams are required for Startup/Hot Standby and Run modes of plant operation. They are, therefore, required to be operational for these modes of reactor operation.

The requirement to have the scram functions, as indicated in Table 3.1.1, operable in the Refuel mode is to assure that shifting to the Refuel mode during reactor power operation does not diminish the need for the reactor protection system.

The turbine condenser low vacuum scram is only required during power operation and must be bypassed to start up the unit. Below 305 psig turbine first stage pressure (45% of rated), the scram

4.1 BASES (Cont'd)

refueling outage. The flow biasing network is functionally tested at least once per month and, in addition, cross calibration checks of the flow input to the flow biasing network can be made during the functional test by direct meter reading. There are several instruments which must be calibrated and it will take several days to perform the calibration of the entire network. While the calibration is being performed, a zero flow signal will be sent to half of the APRM's resulting in a half scram and rod block condition. Thus, if the calibration were performed during operation, flux shaping would not be possible. Based on experience at other generating stations, drift of instruments, such as those in the Flow Biasing Network, is not significant and therefore, to avoid spurious scrams, a calibration frequency of each refueling outage is established.

Group (C) devices are active only during a given portion of the operational cycle. For example, the IRM is active during startup and inactive during full-power operation. Thus, the only test that is meaningful is the one performed just prior to shutdown or startup; i.e., the tests that are performed just prior to use of the instrument.

Group (D) devices, while similar in description to those in Group (B), are different in use because they (the analog transmitter/trip unit devices) provide alarms, trips or scram functions. An availability analysis is detailed in NEDO-21617A (12/78).

Surveillance frequencies for the SDV system instrumentation is detailed in Amendment Number 65. NRC concurrence with this surveillance pro-

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TABLE 4.2.A
MINIMUM TEST AND CALIBRATION FREQUENCY FOR PCIS

	<u>Instrument Channel (5)</u>	<u>Instrument Functional Test</u>	<u>Calibration Frequency</u>	<u>Instrument Check</u>
1)	Reactor High Pressure	(1) (7)	(7)	Once/day
2)	Reactor Low-Low Water Level	(1) (7)	(7)	Once/day
3)	Reactor High Water Level	(1) (7)	(7)	Once/day
4)	Main Steam High Temp.	(1)	Once/3 months	None
5)	Main Steam High Flow	(1) (7)	(7)	Once/day
6)	Main Steam Low Pressure	(1) (7)	(7)	Once/day
7)	Reactor Water Cleanup High Flow	(1)	Once/3 months	Once/day
8)	Reactor Water Cleanup High Temp.	(1)	Once/3 months	None

Logic System Functional Test (4) (6)

	<u>Frequency</u>
1) Main Steam Line Isolation Vvs. Main Steam Line Drain Vvs. Reactor Water Sample Vvs.	Once/6 months
2) RHR - Isolation Vv. Control Shutdown Cooling Vvs. Head Spray Discharge to Radwaste	Once/6 months
3) Reactor Water Cleanup Isolation	Once/6 months
4) Drywell Isolation Vvs. TIP Withdrawal Atmospheric Control Vvs. Sump Drain Valves	Once/6 months
5) Standby Gas Treatment System Reactor Building Isolation	Once/6 months

PNPS
TABLE 4.2.B
MINIMUM TEST AND CALIBRATION FREQUENCY FOR CSCS

	<u>Instrument Channel</u>	<u>Instrument Functional Test</u>	<u>Calibration Frequency</u>	<u>Instrument Check</u>
1)	Reactor Water Level	(1) (7)	(7)	Once/day
2)	Drywell Pressure	(1) (7)	(7)	Once/day
3)	Reactor Pressure	(1) (7)	(7)	Once/day
4)	Auto Sequencing Timers	NA	Once/Operating cycle	None
5)	ADS - LPCI or CS Pump Disch. Pressure Interlock	(1)	Once/3 months	None
6)	Start-up Transf. (4160V)			
	a. Loss of Voltage Relays	Monthly	Once/Operating cycle	None
	b. Degraded Voltage Relays	Monthly	Once/Operating cycle	None
7)	Trip System Bus Power Monitors	Once/operating cycle	N/A	Once/day
8)	Recirculation System d/p	(1)	Once/3 months	Once/day
9)	Core Spray Sparger d/p	NA	Once/Operating cycle	Once/day
10)	Steam Line High Flow (HPCI & RCIC)	(1)	Once/3 months	None
11)	Steam Line High Temp. (HPCI & RCIC)	(1)	Once/3 months	None
12)	Safeguards Area High Temp.	(1)	Once/3 months	None
13)	HPCI and RCIC Steam Line Low Pressure	(1)	Once/3 months	None
14)	HPCI Suction Tank Levels	(1)	Once/3 months	None
15)	Emergency 4160V Buses A5 & A6 Loss of Voltage Relays	Monthly	Once/Operating Cycle	None

NOTES FOR TABLES 4.2.A THROUGH 4.2.G

1. Initially once per month until exposure hours (M as defined on Figure 4.1.1) is 2.0×10^5 ; thereafter, according to Figure 4.1.1 with an interval not less than one month nor more than three months.
2. Functional tests, calibrations and instrument checks are not required when these instruments are not required to be operable or are tripped. Functional tests shall be performed before each startup with a required frequency not to exceed once per week. Calibrations of IRMs and SRMs shall be performed during each startup or during controlled shutdowns with a required frequency not to exceed once per week. Instrument checks shall be performed at least once per day during those periods when the instruments are required to be operable.
3. This instrumentation is excepted from the functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel.

These instrument channels will be calibrated using simulated electrical signals once every three months.
4. Simulated automatic actuation shall be performed once each operating cycle. Where possible, all logic system functional tests will be performed using the test jacks.
5. Reactor low water level, high drywell pressure and high radiation main steam line tunnel are not included on Table 4.2.A since they are tested on Table 4.1.2.
6. The logic system functional tests shall include a calibration of time delay relays and timers necessary for proper functioning of the trip systems.
7. Calibration of analog trip units will be performed concurrent with functional testing. The functional test will consist of injecting a simulated electrical signal into the measurement channel. Calibration of associated analog transmitters will be performed each refueling outage.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 99 TO FACILITY OPERATING LICENSE NO. DPR-35

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

DOCKET NO. 50-293

1.0 INTRODUCTION

By letter dated February 27, 1986, as corrected October 20, 1986, the Boston Edison Company (licensee) requested a revision to the Pilgrim Technical Specification Tables 4.1.1, 4.1.2, 4.2.A and 4.2.B associated with the addition of an analog trip system. This change incorporates new minimum calibration and test frequencies for instrument channels. The analog trip system was presented earlier to the NRC staff for review in General Electric topical reports NEDO-21617 and NEDO-21617-A. The staff reviewed and found the analog transmitter/trip unit system (NEDO-21617-A) acceptable in its letter to General Electric dated June 27, 1978. The topical report provides a description of General Electric's proposed equipment to be utilized for certain engineering safeguard sensor trip inputs including inputs for the reactor protection system, emergency core cooling system and nuclear steam supply shut off systems. The proposed equipment replaces pressure, level or temperature switches with analog transmitter/trip unit combinations. This equipment then provides the equipment logic trip inputs of the switches.

2.0 EVALUATION

The Analog Transmitter/Trip Unit System (ATTUS), as stated above, is a replacement for the mechanical type sensor switches at the sensor level only. The ATTUS provides the input for the plant process parameters to the system logics for the reactor protection system, the primary containment isolation system and the core standby cooling system. Since the dual channel design (with two trip systems) of the reactor trip system is not being altered, the safe and reliable operation of the trip system is not compromised. The proposed technical specification changes would relax surveillance requirements for the analog transmitter without reducing system availability, accuracy and reliability below levels which existed before the analog trip system modification. The changes proposed would revise test and calibration frequencies by requiring analog transmitter calibration once per cycle during refueling outages. Calibration of analog trip units would be performed concurrent with functional testing. With this change, a daily instrument check would also be required which will provide a degree of confidence of system operability that was not feasible with the mechanical switches and sensors. In addition, the licensee would provide a gross failure alarm with the analog trip system which annunciates sensor failure.

We have reviewed the proposed Technical Specification changes which reflect the addition of an analog transmitter/trip unit system, and find that they would permit operation of the Pilgrim station in a manner that is consistent with our requirements on previous applications. These changes are, therefore, acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement nor environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security nor to the health and safety of the public.

Principal Contributor: N. Trehan

Dated: March 3, 1987