

September 8, 1988

Docket No. 50-293

Mr. Ralph G. Bird
Senior Vice President - Nuclear
Boston Edison Company
Pilgrim Nuclear Power Station
RFD #1 Rocky Hill Road
Plymouth, Massachusetts 02360

Dear Mr. Bird:

SUBJECT: ISSUANCE OF AMENDMENT NO. 120 TO FACILITY OPERATING LICENSE
NO. DPR-35 PILGRIM NUCLEAR POWER STATION

REF: TAC No. 68656 - Revised Technical Specifications for Degraded
Voltage Trip and Alarm Setpoints

The Commission has issued Amendment No. 120 to Facility Operating License
No. DPR-35 for the Pilgrim Nuclear Power Station. The amendment is in
response to your application dated June 30, 1988.

This amendment would change the degraded voltage trip and alarm setpoints
based on a recent analysis of the electrical power distribution system for
Pilgrim Station. The installation of newer, more reliable and higher quality
solid state relays allows the revised setpoints and tolerances to be used.

A copy of our Safety Evaluation is provided as Enclosure 2. The Notice of
Issuance will be included in the Commission Bi-Weekly Federal Register Notice.

Sincerely,

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Daniel G. McDonald, Senior Project Manager
Project Directorate I-3
Division of Reactor Projects I/II

Enclosures:

- 1. Amendment No. 120 to License No. DPR-35
 - 2. Safety Evaluation Report
- cc w/enclosures:
See next page

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

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Sincerely,

A handwritten signature in cursive script that reads "Daniel G. McDonald Jr.".

Daniel G. McDonald, Senior Project Manager
Project Directorate I-3
Division of Reactor Projects I/II

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1. Amendment No. 120 to
License No. DPR-35
2. Safety Evaluation Report

cc w/enclosures:

See next page

Mr. Ralph G. Bird
Boston Edison Company

Pilgrim Nuclear Power Station

cc:

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AMENDMENT NO. 120 TO FACILITY OPERATING LICENSE DPR-35

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Docket 50-293 ←

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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. 120
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 June 30, 1988 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:

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(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 120, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard H. Wessman, Director
Project Directorate I-3
Division of Reactor Projects I/II

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 8, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 120
FACILITY OPERATING LICENSE NO. DPR-35
DOCKET NO. 50-293

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

<u>Remove Pages</u>	<u>Insert Pages</u>
49	49
50a	50a
53a	53a
197	197

PNPS TABLE 3.2.B (Cont'd)
INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum # of Operable Instrument Channels Per Trip System (1)	Trip Function	Trip Level Setting	Remarks
1	Core Spray Pump Start Timer	0<t<1 sec.	Initiates sequential starting of CSCS pumps on any auto start.
1	LPCI Pump Start Timer	4<t<6 sec.	
1	LPCI Pump Start Timer	9<t<11 sec.	
1	Auto Blowdown Timer	≥90, ≤120 sec.	In conjunction with Low Low Reactor Water Level, High Drywell Pressure and LPCI or Core Spray Pump running interlock, initiates Auto Blowdown.
2	ADS Drywell Pressure Bypass Timer	11 ± 2 min.	Permits starting CS and LPCI pumps and actuating ADS SRV's if RPV water level is low and drywell pressure is not high.
2	RHR (LPCI) Pump Discharge Pressure Interlock	150 ± 10 psig	Defers ADS actuation pending confirmation of Low Pressure core cooling system operation. (LPCI or Core Spray Pump running interlock.)
2	Core Spray Pump Discharge Pressure Interlock	150 ± 10 psig	
2	Emergency Bus Voltage Relay	20-25% of rated voltage resets at less than 50%	1. Permits closure of the Diesel Generator to an unloaded emergency bus. 2. Permits starting of CSCS 4 kV motors.

PNPS TABLE 3.2.B (Cont'd)
INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

<u>Minimum # of Operable Instrument Channels Per Trip System (1)</u>	<u>Trip Function</u>	<u>Trip Level Setting</u>	<u>Remarks</u>
2	Startup Transformer Degraded Voltage	3868V \pm 0.5% with 9.2 \pm 0.5 seconds time delay	<ol style="list-style-type: none"> 1. Trips Startup Transformer to Emergency Bus Breaker. 2. Locks out automatic closure of Startup Transformer to Emergency Bus. 3. Initiates starting of Diesel Generators in conjunction with loss of auxiliary transformer. 4. Prevents simultaneous starting of CSCS components. 5. Starts load shedding logic for Diesel Operation in conjunction with <ol style="list-style-type: none"> a) Low Low Reactor Water Level and Low Reactor Pressure or b) High drywell pressure or c) Core Standby Cooling System components in service in conjunction with Auxiliary Transformer breaker open.

PNPS TABLE 3.2.B.1
INSTRUMENTATION THAT MONITORS EMERGENCY BUS VOLTAGE

<u>Minimum # of Operable Instrument Channels Per Trip System</u>	<u>Function</u>	<u>Setting</u>	<u>Remarks</u>
1	Emergency 4160V Buses A5 & A6 Degraded Voltage Annunciation (1)	3959V \pm 0.5% with 9.2 \pm 0.5 seconds time delay	Alerts Operator to possible degraded voltage conditions. Provides permissive to initiate load shedding in conjunction with LOCA signal.

(1) In the event that the alarm system is determined inoperable, commence logging safety related bus voltage every 1/2 hour until such time as the alarm is restored to operable status.

3.9.B Operation with Inoperable Equipment

following conditions are satisfied:

- a. The startup transformer and both offsite 345 kV transmission lines are available and capable of automatically supplying auxiliary power to the emergency 4160 volt buses.
- b. A transmission line and associated shutdown transformer are available and capable of automatically supplying auxiliary power to the emergency 4160 volt buses.
5. From and after the date that one of the 125 or 250 volt battery systems is made or found to be inoperable for any reason, continued reactor operation is permissible during the succeeding three days within electrical safety considerations, provided repair work is initiated in the most expeditious manner to return the failed component to an operable state, and Specification 3.5.F is satisfied.
6. With the emergency bus voltage less than 3959V but above 3868V (excluding transients) during normal operation, transfer the safety related buses to the diesel generators. If grid voltage continues to degrade be in at least Hot Shutdown within the next 4 hours and in Cold Shutdown within the following 12 hours unless the grid conditions improve.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 120
TO FACILITY OPERATING LICENSE NO. DPR-35
BOSTON EDISON COMPANY
PILGRIM NUCLEAR POWER STATION
DOCKET NO. 50-293

1.0 INTRODUCTION

To improve their electrical power distribution system design and control, Boston Edison Company performed an analysis and identified the need to change the trip and alarm setpoints for the Pilgrim Nuclear Power Station (PNPS) degraded voltage relays. By letter dated June 30, 1988, the licensee requested a revision to Technical Specification trip and alarm setpoints for degraded voltage protection.

2.0 EVALUATION

Boston Edison Company has proposed changes to the degraded voltage trip and alarm setpoints. The new setpoints have been determined as a result of additional analysis of the electrical power distribution system for Pilgrim Station. The analysis indicated that when the plant is being supplied from the startup transformer and supply voltage does not remain below the degraded voltage setpoint for longer than 9.2 seconds, the 4kV safety-related buses remain energized from the startup transformer. While degraded voltage trip conditions have not been met, this voltage may be only slightly above the degraded voltage setpoint. With the existing 3745V +2% setpoint, safety-related ECCS equipment may not have adequate voltage to operate properly. The degraded voltage setpoints are, therefore, being raised to assure the supply voltage to safety-related equipment remains adequate under this operating condition. When the plant is being supplied from the startup transformer and supply voltage remains below the degraded voltage trip setpoint for longer than 9.2 seconds, the startup transformer supply breakers for both safety-related 4kV buses will open, the diesel generators will start and the diesel supply breakers will close to each 4kV bus.

The licensee will install new degraded voltage relays with improved sensitivity to accommodate higher trip alarm setpoints. The proposed degraded voltage trip setpoint of $3868V \pm 0.5\%$, yields 3849V as the lowest allowed trip setpoint. This setpoint provides adequate margin over the minimum bus voltage and thus assures the adequacy of the 480V power supplies that come from the 4kV buses. The corrected degraded voltage trip setpoint calculations indicate a 480V motor control center voltage of 434V will occur when a 4kV bus reaches 3849V (assuming worst case LOCA loading conditions with load shedding initiated). This provides a 4V margin over the corrected minimum acceptable voltage of 430V and is, therefore, acceptable.

The degraded voltage alarm relay is also being used to enable load shedding on the safety related buses. The proposed degraded voltage alarm setpoint of $3959V \pm .5\%$, yields 3939V as the lowest allowed alarm setpoint. This setpoint provides an adequate margin over the minimum bus voltage that will

assure the adequacy of the associated 480V power supplies. The corrected degraded voltage alarm setpoint calculation indicates that with the worse case LOCA loading conditions, but without load shedding initiated, a 480V supply voltage of 434V will result when there is 3939V on the 4kV bus. Therefore, if the 4kV bus voltage drops below the lowest allowed alarm setpoint, load shedding must be initiated to assure the adequacy of the 480V power supplies when a signal indicating a LOCA is received. We find this to be acceptable.

The licensee has proposed to change the Remarks column of Table 3.2.B for the core spray and LPCI pump start timers from: "In conjunction with loss of power initiates sequential starting of CSCS pumps." to: "Initiates sequential startup of CSCS pumps on any auto start." We find this to be acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in 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 or environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

We have reviewed the licensee's submittal and have concluded that raising the degraded voltage setpoints and using tighter, more conservative setpoint tolerances does not affect the operation of safety related equipment, other than its initiation at a higher voltage. This will ensure the voltage at the safety related devices continues to be maintained above the voltage where proper operation can be assured and, therefore, the change is acceptable. 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 the amendment will not be inimical to the common defense and security or to the health and safety of the public. Accordingly, we conclude that the proposed changes are acceptable.

Acknowledgement: N. Trehan, SELB/DEST

Date Issued: September 8, 1988