

Docket No. 50-293

December 4, 1989

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. 127 TO FACILITY OPERATING LICENSE NO.
DPR-35 - PILGRIM NUCLEAR POWER STATION (TAC NO. 62793)

The Commission has issued the enclosed Amendment No. 127 to Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station. This amendment is in response to your application dated September 11, 1989.

This amendment revises Technical Specification Section 3/4.9, "Auxiliary Electrical System," by adding Sections 3.9.A.7 and 4.9.A.4. These sections include limiting conditions of operation and surveillance requirements reflecting the installation of Electrical Protection Assemblies to the Reactor Protection System power supplies at the Pilgrim Nuclear Power Station. The bases for Section 3/4.9 are also revised to reflect the proposed changes.

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

Sincerely,



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

Enclosures:

1. Amendment No. 127 to License No. DPR-35
2. Safety Evaluation

cc w/enclosures:
See next page

TAC 62793 A

CP-1

OFC	: PDI-3/PM	: PDI-3/LA	: OGC	: PDI-3/D	:	:	:
NAME	: DGMcDonald	: MRusbrook	:	: RHessman	:	:	:
DATE	: 11/1/89	: 11/1/89	: 11/27/89	: 11/30/89	:	:	:

OFFICIAL RECORD COPY

8912120009 891204
PDR ADOCK 05000293
P PDC

DF01
11



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

December 4, 1989

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. 127 TO FACILITY OPERATING LICENSE NO.
DPR-35 - PILGRIM NUCLEAR POWER STATION (TAC NO. 62793)

The Commission has issued the enclosed Amendment No. 127 to Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station. This amendment is in response to your application dated September 11, 1989.

This amendment revises Technical Specification Section 3/4.9, "Auxiliary Electrical System," by adding Sections 3.9.A.7 and 4.9.A.4. These sections include limiting conditions of operation and surveillance requirements reflecting the installation of Electrical Protection Assemblies to the Reactor Protection System power supplies at the Pilgrim Nuclear Power Station. The bases for Section 3/4.9 are also revised to reflect the proposed changes.

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

Sincerely,

A handwritten signature in dark ink, appearing to read "Daniel G. McDonald", is written over the typed name.

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

Enclosures:

1. Amendment No. 127 to
License No. DPR-35
2. Safety Evaluation

cc w/enclosures:
See next page

Mr. Ralph G. Bird

December 4, 1989

cc:

Mr. K. L. Highfill
Vice President of Operations/
Station Station
Pilgrim Nuclear Power Station
RFD #1 Rocky Hill Road
Plymouth, Massachusetts 02360

Mr. Richard N. Swanson, Manager
Nuclear Engineering Department
Boston Edison Company
25 Braintree Hill Park
Braintree, Massachusetts 02184

Resident Inspector
U. S. Nuclear Regulatory Commission
Pilgrim Nuclear Power Station
Post Office Box 867
Plymouth, Massachusetts 02360

Ms. Elaine D. Robinson
Nuclear Information Manager
Pilgrim Nuclear Power Station
RFD #1, Rocky Hill Road
Plymouth, Massachusetts 02360

Chairman, Board of Selectmen
11 Lincoln Street
Plymouth, Massachusetts 02360

Mr. Charles V. Barry
Secretary of Public Safety
Executive Office of Public Safety
One Ashburton Place
Boston, Massachusetts 02108

Office of the Commissioner
Massachusetts Department of
Environmental Quality Engineering
One Winter Street
Boston, Massachusetts 02108

Office of the Attorney General
One Ashburton Place
20th Floor
Boston, Massachusetts 02108

Mr. Robert M. Hallisey, Director
Radiation Control Program
Massachusetts Department of
Public Health
150 Tremont Street, 2nd Floor
Boston, Massachusetts 02111

Regional Administrator, Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406

Mr. John Dietrich
Licensing Division Manager
Boston Edison Company
25 Braintree Hill Park
Braintree, Massachusetts 02184

AMENDMENT NO. 127 TO DPR-35 PILGRIM NUCLEAR POWER STATION DATED December 4, 1989

DISTRIBUTION:

Docket File 50-293 <

NRC PDR

Local PDR

PDI-3 Reading

S. Varga

B. Boger

M. Rushbrook

D. McDonald

R. Wessman

OGC

Dennis Hagan

E. Jordan

B. Grimes

G. Hill (4)

Wanda Jones - P-522 Phillips Building

J. Calvo

ACRS (10)

GPA/PA - 2G5 OWFN

ARM/LFMB

J. Johnson, Region I



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. 127
License No. DPR-35

1. The Nuclear Regulatory Commission (the Commission or the NRC) has found that:
 - A. The application for amendment filed by the Boston Edison Company (the licensee) dated September 11, 1989, 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 set forth in 10 CFR Chapter I;
 - 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:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 127, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

8912120012 891204
PDR ADOCK 05000293
PDC
P

3. This license amendment is effective as of its 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
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 4, 1989

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

FOR THE NUCLEAR REGULATORY COMMISSION

15/
Richard H. Wessman, Director
Project Directorate I-3
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 4, 1989

OFC	: PDI-3/PM	: PDI-3/LA	: OGC	: PDI-3/D	: SELB/BC	:
NAME	: DGMald	: MRushbrook	:	: RHWesman	: FROSA	:
DATE	: 11/06/89	: 11/14/89	: 11/17/89	: 11/30/89	: 11/15/89	:

OFFICIAL RECORD COPY

ATTACHMENT TO LICENSE AMENDMENT NO.127

FACILITY OPERATING LICENSE NO. DPR-35

DOCKET NO. 50-293

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove

195
196
197
199
201

Insert

195
196
197
199
201

3.9.A AUXILIARY ELECTRICAL EQUIPMENT
(Cont'd)

4. 4160 volt buses A5 and A6 are energized and the associated 480 volt buses are energized.
5. The station and switchyard 125 and 250 volt batteries are operable. Each battery shall have an operable battery charger.
6. Emergency Bus Degraded Voltage Annunciation System as specified in Table 3.2.B.1 is operable.

7. Specification

Two redundant RPS Electrical Protection Assemblies (EPAs) shall be operable at all times on both inservice power supplies.

Action

- a. With one EPA on an inservice power supply inoperable, continued operation is permissible provided that the EPA is returned to operable status or power is transferred to a source with two operable EPAs within 72 hours. If this requirement cannot be met, trip the power source.
- b. With both RPS EPAs found to be inoperable on an inservice power supply, continued operation is permissible, provided at least one EPA is restored to operable status or power is transferred to a source with at least one operable EPA within 30 minutes. If this requirement cannot be met, trip the power source.

NOTE: Only applicable if tripping the power source would not result in a scram.

4.9.A AUXILIARY ELECTRICAL EQUIPMENT
SURVEILLANCE (Cont'd)

- d. Once a month the quantity of diesel fuel available shall be logged.
- e. Once a month a sample of diesel fuel shall be checked for quality in accordance with ASTM D4057-81 or D4177-82. The quality shall be within the acceptable limits specified in Table 1 of ASTM D975-81 and logged.

2. Station and Switchyard Batteries

- a. Every week the specific gravity, the voltage and temperature of the pilot cell and overall battery voltage shall be measured and logged.
- b. Every three months the measurements shall be made of voltage of each cell to nearest 0.1 volt, specific gravity of each cell, and temperature of every fifth cell. These measurements shall be logged.
- c. Once each operating cycle, the stated batteries shall be subjected to a rated load discharge test. The specific gravity and voltage of each cell shall be determined after the discharge and logged.

3. Emergency 4160V Buses A5-A6 Degraded Voltage Annunciation System.

- a. Once each operating cycle, calibrate the alarm sensor.
- b. Once each 31 days perform a channel functional test on the alarm system.

3.9.B Operation with Inoperable Equipment

Whenever the reactor is in Run Mode or Startup Mode with the reactor not in a Cold Condition, the availability of electric power shall be as specified in 3.9.B.1, 3.9.B.2, 3.9.B.3, 3.9.B.4, and 3.9.B.5.

1. From and after the date that incoming power is not available from the startup or shutdown transformer, continued reactor operation is permissible under this condition for seven days. During this period, both diesel generators and associated emergency buses must be demonstrated to be operable.
2. From and after the date that incoming power is not available from both startup and shutdown transformers, continued operation is permissible, provided both diesel generators and associated emergency buses are demonstrated to be operable, all core and containment cooling systems are operable, reactor power level is reduced to 25% of design and the NRC is notified within one (1) hour as required by 10CFR50.72.
3. From and after the date that one of the diesel generators or associated emergency bus is made or found to be inoperable for any reason, continued reactor operation is permissible in accordance with Specification 3.5.F if Specification 3.9.A.1 and 3.9.A.2.a are satisfied.
4. From and after the date that one of the diesel generators or associated emergency buses and either the shutdown or startup transformer power source are made

4.9.A Auxiliary Electrical Equipment Surveillance (Cont'd)

- c. In the event the alarm system is determined inoperable under 3.b above, commence logging safety related bus voltage every 30 minutes until such time as the alarm is restored to operable status.

4. RPS Electrical Protection Assemblies

- a. Each pair of redundant RPS EPAs shall be determined to be operable at least once per 6 months by performance of an instrument functional test.
- b. Once per operating cycle, each pair of redundant RPS EPAs shall be determined to be operable by performance of an instrument calibration and by verifying tripping of the circuit breakers upon the simulated conditions for automatic actuation of the protective relays within the following limits:

Overvoltage \leq 132 volts
Undervoltage \geq 108 volts
Underfrequency \geq 57Hz

3.9.B Operation with Inoperable Equipment (Cont'd)

or found to be inoperable for any reason, continued reactor operation is permissible in accordance with Specification 3.5.F, provided either of the 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.

3.9

can be used for either 125 volt battery, (2) a 250 volt d-c back-up battery charger is supplied. Thus, on loss of normal battery charger, the back-up charger can be used. The 125 volt battery system shall have a minimum of 105 volts at the battery terminals to be considered operable. The 250 volt battery system shall have a minimum of 210 volts at the battery terminals to be considered operable.

Automatic second level undervoltage (Degraded Voltage) protection is installed on the startup transformer and is available when safety related loads are being supplied from this source. During normal operation, the unit auxiliary transformer supplies safety related buses. Automatic second level undervoltage protection is not installed on the unit auxiliary transformer. The Safety Bus Degraded Voltage Alarm System and new Degraded Voltage Operating Procedure will be relied upon to guide Operator action to preclude operation with a degraded bus voltage condition.

Each of the two motor generator sets and the alternate power supply for the Reactor Protection System (RPS) have two Electrical Protection Assemblies (EPAs), installed in series, between the RPS 120 Volt 60Hz power source and its respective RPS bus. A random, or seismically-induced abnormal voltage or frequency condition on the output of an MG Set or on the alternate supply would trip one or both of the EPAs. This protects the RPS components and auxiliaries from damage due to sustained abnormal voltage conditions (overvoltage, undervoltage or underfrequency).

The 72 hour maximum service limit of an "inservice power supply" with only one EPA operable provides reasonable assurance that a single failure would not prevent an abnormal voltage condition from being detected prior to damaging RPS components. The "inservice power supplies" are defined as either the two RPS MG Sets or one RPS MG Set and the alternate power source fed from B10/B6. The 30 minute maximum service limit without either EPA operable provides reasonable assurance that an abnormal voltage condition would not damage RPS components. The tripping of an RPS power supply to an RPS bus will result in a half-scam on that channel.

4.9

The diesel fuel oil quality must be checked to ensure proper operation of the diesel generators. Water content should be minimized because water in the fuel could contribute to excessive damage to the diesel engine.

When it is determined that some auxiliary electrical equipment is out of service, the increased surveillance required in Section 4.5.F is deemed adequate to provide assurance that the remaining equipment will be operable.

The Electrical Protection Assemblies (EPAs) on the RPS inservice power supplies (either two motor generator sets or one motor generator and the alternate supply), consist of protective relays that trip their incorporated circuit breakers on overvoltage, undervoltage or underfrequency conditions. There are 2 EPAs in series per power source. It is necessary to periodically test the relays to ensure the sensor is operating correctly and to ensure the trip unit is operable. Based on experience at conventional and nuclear power plants, a six month frequency for the channel functional test is established. This frequency is consistent with the Standard Technical Specifications.

The EPAs of the power sources to the RPS shall be determined to be operable by performance of a channel calibration of the relays once per operating cycle. During calibration, a transfer to the alternate power source is required; however, prior to switching to alternate feed, de-energization of the applicable MG set power source must be accomplished. This results in a half-scam on the channel being calibrated until the alternate power source is connected and the half scam is cleared. Based on operating experience, drift of the EPA protective relays is not significant. Therefore, to avoid possible spurious scrams, a calibration frequency of once per cycle is established.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 127

TO FACILITY OPERATING LICENSE NO. DPR-35

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

DOCKET NO. 50-293

1.0 INTRODUCTION

By letter dated September 24, 1980, the NRC requested that Boston Edison Company (BECo) modify the power supplies for the Reactor Protection System (RPS) at the Pilgrim Nuclear Power Station (PNPS). The modifications consisted of the installation of GE designed undervoltage, overvoltage, and under-frequency protective circuitry, two in each of three sources of power to the RPS (two M-G sets and one alternate source). The staff approved the modifications subject to the requirement that appropriate surveillance of the RPS protective circuitry be implemented as part of the technical specifications. By letter dated February 17, 1987, BECo proposed that the surveillance be implemented by procedure and be limited to calibration on a once per operating cycle frequency.

By letter dated July 15, 1988, the NRC staff found the BECo proposal unacceptable and provided the basis for its conclusion in a Safety Evaluation which was provided as an enclosure to the letter.

By letter dated September 11, 1989, BECo proposed an amendment which would modify Technical Specification Section 3/4.9, "Auxiliary Electrical System," by adding Sections 3.9.A.7 and 4.9.A.4. These sections include limiting conditions of operations and surveillance requirements reflecting the installation of the Electrical Protection Assemblies to the Reactor Protection System power supplies at the PNPS. The bases for Section 3/4.9 are also modified to reflect the proposed changes. The proposed changes are in accordance with our request that the proposed technical specifications be provided for the RPS protective circuitry.

2.0 EVALUATION

In response to the NRC request discussed above, BECo installed redundant Class 1E Electrical Protection Assemblies (EPAs) between the non-Class 1E Reactor Protection System (RPS) power supplies and the Class 1E RPS power supplies at the PNPS. The EPAs consist of a contactor that is opened by (1) an overvoltage greater than or equal to 132 volts, (2) an undervoltage less than or equal to 108 volts, or (3) an underfrequency less than or equal to 57Hz. The cabinets and conduits for the EPAs are located in a seismic Category 1 structure which provide

protection from the effects of tornadoes, tornado missiles, and external floods. The components of each monitoring system are also seismically qualified for Class 1E application. Each RPS bus, including the alternate supply, has independent and fully redundant circuit interrupters. This redundancy provides single failure protection in case one EPA does not function properly, and also provides sufficient reliability to ensure the RPS performs its intended safety function.

To provide assurance that the EPAs will isolate non-Class 1E RPS power supplies from Class 1E power distribution buses upon detection of overvoltage, undervoltage, or underfrequency at the RPS power supplies, surveillance and calibration requirements are necessary. In addition, limiting conditions of operation (LCO) are also necessary to assure the availability of the EPAs.

The selection of the proposed EPA trip level settings at $\pm 10\%$ of nominal voltage and -5% of nominal frequency allows the RPS motor generator (MG) sets to function within their intended and designed time, voltage and frequency range before the EPAs trip. The settings support the design and function of the high-inertia MG sets, and therefore, support the assumptions made in the Pilgrim Final Safety Analysis Report (FSAR).

Thus, the proposed trip level settings in Section 4.9.A.4.b of the PNPS Technical Specification are bounded by the accident analysis in the current PNPS FSAR.

The proposed surveillance requirements in Section 4.9.A.4.a, six month instrument functional test, and 4.9.A.4.b, an instrument calibration and verification of tripping the circuit breakers, are consistent with the Standard Technical Specification (STS) for Boiling Water Reactors. Since these surveillance and calibration requirements are additional limitations not currently required, and based on the design of the EPAs and their intended function as discussed above, the proposed surveillance intervals provide reasonable assurance that the EPAs will be capable of performing their isolation function.

The proposed LCOs in Section 3.9.A.7.a and .b provide additional limitations on the RPS, which are not currently required, and are consistent with the guidance provided in the STS; therefore, reasonable assurance is provided that the EPAs will be available to perform their isolation function when necessary.

3.0 SUMMARY

The proposed technical specifications, including the updated basis, are in accordance with the guidance provided by the NRC staff and provide reasonable assurance that the EPAs have appropriate trip level settings, will be available, and will be capable of performing their intended function based on the design discussed above; therefore, they are acceptable.

4.0 ENVIRONMENTAL CONSIDERATIONS

This amendment changes requirements with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes to the surveillance requirements. 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 there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously published a proposed finding

that the amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the 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 the amendment.

5.0 CONCLUSION

We have 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 or to the health and safety of the public.

Principal Contributor: D. McDonald

Dated: December 4, 1989