Mr. E. Thomas Boulette, Ph.D
Senior Vice President, Nuclear
Boston Edison Company
Pilgrim Nuclear Power Station
RFD #1 Rocky Hill Road
Plymouth, MA 02360

February 10, 1997

SUBJECT: ISSUANCE OF AMENDMENT NO. 170 TO FACILITY OPERATING LICENSE NO. DPR-35, PILGRIM NUCLEAR POWER STATION (TAC NO. M95277)

Dear Mr. Boulette:

The Commission has issued the enclosed Amendment No. 170 to Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station. This amendment is in response to your application dated April 25, 1996, as supplemented on December 23, 1996.

The amendment will revise the definition of Operable-Operability, revise Technical Specifications (TS) and associated Bases Section for TSs 3.9.B.2 and 3.9.B.3, "Auxiliary Electrical System," TS 3.4.B.1, "Standby Liquid Control System," TSs 3.7.B.1.a, c, and e, and 3.7.b.2.a, c, and e, "Standby Gas Treatment System and Control Room High Efficiency Air Filtration System," and TSs 4.5.F.1, "Core and Containment Cooling Systems," and delete TS 3.7.B.1.f, "Standby Gas Treatment System and Control Room High Efficiency Air Filtration System." The changes to the allowed outage times for the emergency diesel generators and AC power sources as related to TSs and the associated Bases Section for TSs 3.9.B.1, "Auxiliary Electrical System," and TSs 3.5.F.1, "Core and Containment Cooling Systems," are still under staff review.

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

Sincerely,

/S/

Alan Wang, Project Manager
Project Directorate I-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-293

Enclosures: 1. Amendment No. 170 to License No. DPR-35
2. Safety Evaluation

cc w/encls: See next page

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AMENDMENT NO. 170 TO FACILITY OPERATING LICENSE NO. DPR-35-PILGRIM NUCLEAR POWER STATION

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 10, 1997

Mr. E. Thomas Boulette, Ph.D
Senior Vice President - Nuclear
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Pilgrim Nuclear Power Station
RFD #1 Rocky Hill Road
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SUBJECT: ISSUANCE OF AMENDMENT NO.170 TO FACILITY OPERATING LICENSE NO. DPR-35, PILGRIM NUCLEAR POWER STATION (TAC NO. M95277)

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Sincerely,

Alan Wang

Alan Wang, Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-293

Enclosures: 1. Amendment No.170 to License No. DPR-35
2. Safety Evaluation

cc w/encls: See next page

E. Thomas Boulette
cc:

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

BOSTON EDISON COMPANY

DOCKET NO. 50-293

PILGRIM NUCLEAR POWER STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.170
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 April 25, 1996, as supplemented on December 23, 1996, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations;

   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 2.C.(2) of Facility Operating License No. DPR-35 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 170, 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 its date of issuance and shall be implemented within 90 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Patrick D. Milano, Acting 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: February 10, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 170

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	Insert
1.1	1.1
3/4.4-1	3/4.4-1
3/4.5-7	3/4.5-7
3/4.7-11	3/4.7-11
3/4.7-12	3/4.7-12
3/4.7-13	3/4.7-13
3/4.7-14	3/4.7-14
3/4.7-15	3/4.7-15
3/4.7-16	3/4.7-16
3/4.9-4	3/4.9-4
B3/4.7-10	B3/4.7-10
B3/4.7-12	B3/4.7-12

1.0 DEFINITIONS

The succeeding frequently used terms are explicitly defined so that a uniform interpretation of the specifications may be achieved.

A. Safety Limit

The safety limits are limits below which the reasonable maintenance of the cladding and primary systems are assured. Exceeding such a limit is cause for unit shutdown and review by the Nuclear Regulatory Commission before resumption of unit operation. Operation beyond such a limit may not in itself result in serious consequences but it indicates an operational deficiency subject to regulatory review.

B. Limiting Safety System Setting (LSSS)

The limiting safety system settings are settings on instrumentation which initiate the automatic protective action at a level such that the safety limits will not be exceeded. The region between the safety limit and these settings represent margin with normal operation lying below these settings. The margin has been established so that with proper operation of the instrumentation the safety limits will never be exceeded.

C. Limiting Conditions for Operation (LCO)

The limiting conditions for operation specify the minimum acceptable levels of system performance necessary to assure safe startup and operation of the facility. When these conditions are met, the plant can be operated safely and abnormal situations can be safely controlled.

D. Core Operating Limits Report

The CORE OPERATING LIMITS REPORT is a reload-cycle specific document, its supplements and revisions, that provides core operating limits for the current operating reload cycle. These cycle specific core operating limits shall be determined for each reload cycle in accordance with Specification 6.9.A.4. Plant operation within these operating limits is addressed in individual specifications.

E. Operable - Operability

A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal or emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing their related support function(s).

F. Operating

Operating means that a system or component is performing its intended functions in its required manner.

LIMITING CONDITIONS FOR OPERATION

3.4 STANDBY LIQUID CONTROL SYSTEM

Specification:

Two SLC subsystems shall be OPERABLE.

Applicability:

Run and Startup MODES

Operation with Inoperable Equipment

A. With concentration of boron in solution not within limits but > 8%, restore concentration of boron in solution to within limits within 72 hours AND 10 days from discovery of failure to meet the LCO.

B. With one SLC subsystem inoperable for reasons other than Condition A,

   1. ensure that the diesel generator associated with the operable SLC subsystem is operable;

      AND

   2. restore SLC subsystem to OPERABLE status within 7 days AND 10 days from discovery of failure to meet the LCO.

C. With two SLC subsystems inoperable for reasons other than Condition A, restore one SLC subsystem to OPERABLE status within 8 hours.

D. Required Action and associated Completion Time not met, be in Hot Shutdown within 12 hours.

SURVEILLANCE REQUIREMENTS

4.4 STANDBY LIQUID CONTROL SYSTEM

1. When tested as specified in 3.13 verify that each pump delivers at least 39 GPM against a system head of 1275 psig.
2. Manually initiate one of the Standby Liquid Control System loops and pump demineralized water into the reactor vessel every 24 months on a STAGGERED TEST BASIS.
3. Verify continuity of explosive charge every 31 days.
4. Verify available volume of sodium pentaborate solution is within the limits of Figure 3.4–1 or ≥ 4000 gallons every 24 hours.
5. Verify temperature of sodium pentaborate solution is > 48° F every 24 hours.
6. Verify the concentration of boron in solution is ≤ 9.22 % weight and within the limits of Figure 3.4–1 every 31 days;

   AND

   Once within 24 hours after water or boron is added to solution;

   AND

   Once within 24 hours after solution temperature is restored to > 48° F.
7. Verify sodium pentaborate enrichment is ≥ 54.5 atom percent B-10 prior to addition to SLC tank.
8. Verify all heat traced piping between storage tank and pump suction is unblocked every 24 months.

   AND

   Once within 24 hours after solution temperature is restored to > 48° F.
9. Verify temperature of pump suction piping is > 48° F every 24 hours.

LIMITING CONDITION FOR OPERATION

3.5 CORE AND CONTAINMENT COOLING SYSTEMS (Cont)

F. Minimum Low Pressure Cooling and Diesel Generator Availability

1. During any period when one diesel generator is inoperable, continued reactor operation is permissible only during the succeeding 72 hours unless such diesel generator is sooner made operable, provided that all of the low pressure core and containment cooling systems and the remaining diesel generator shall be operable. If this requirement cannot be met, an orderly shutdown shall be initiated and the reactor shall be placed in the Cold Shutdown Condition within 24 hours.

2. Any combination of inoperable components in the core and containment cooling systems shall not defeat the capability of the remaining operable components to fulfill the cooling functions.

3. When irradiated fuel is in the reactor vessel and the reactor is in the Cold Shutdown condition, both core spray systems, the LPCI and containment cooling systems may be inoperable, provided no work is being done which has the potential for draining the reactor vessel.

4. During a refueling outage, for a period of 30 days, refueling operation may continue provided that one core spray system or the LPCI system is operable or Specification 3.5.F.5 is met.

SURVEILLANCE REQUIREMENT

4.5 CORE AND CONTAINMENT COOLING SYSTEMS (Cont)

F. Minimum Low Pressure Cooling and Diesel Generator Availability

1. When it is determined that one diesel generator is inoperable, within 24 hours, determine that the operable diesel generator is not inoperable due to a common cause failure,

   or

   perform surveillance 4.9.A.1.a for the operable diesel generator,

   and

   within 1 hour and once every 8 hours thereafter, verify correct breaker alignment and indicated power availability for each offsite circuit.

3.7 CONTAINMENT SYSTEMS (Cont.)

A. Primary Containment (Cont.)

With no H2 analyzer operable, reactor operation is allowed for up to 48 hours. If one of the inoperable analyzers is not made fully operable within 48 hours, the reactor shall be in a least Hot Shutdown within the next 12 hours.

B. Standby Gas Treatment System and Control Room High Efficiency Air Filtration System

1. Standby Gas Treatment System

a. Except as specified in 3.7.B.1.c or 3.7.B.1.e below, both trains of the standby gas treatment system shall be operable when in the Run, Startup, and Hot Shutdown MODES, during movement of irradiated fuel assemblies in the secondary containment, and during movement of new fuel over the spent fuel pool, and during CORE ALTERATIONS, and during operations with a potential for draining the reactor vessel (OPDRVs),

or

the reactor shall be in cold shutdown within the next 36 hours.

b. 1. The results of the in-place cold DOP tests on HEPA filters shall show ≥99% DOP removal. The results of halogenated hydrocarbon tests on charcoal adsorber banks shall show ≥99% halogenated hydrocarbon removal.

4.7 CONTAINMENT SYSTEMS (Cont.)

B. Standby Gas Treatment System and Control Room High Efficiency Air Filtration System

1. Standby Gas Treatment System

a. 1. At least once per operating cycle, it shall be demonstrated that pressure drop across the combined high efficiency filters and charcoal adsorber banks is less than 8 inches of water at 4000 cfm.

2. At least once per operating cycle, demonstrate that the inlet heaters on each train are operable and are capable of an output of at least 14 kW.

3. The tests and analysis of Specification 3.7.B.1.b. shall be performed at least once per operating cycle or following painting, fire or chemical release in any ventilation zone communicating with the system while the system is operating that could contaminate the HEPA filters or charcoal adsorbers.

4. At least once per operating cycle, automatic initiation of

LIMITING CONDITIONS FOR OPERATION

3.7 CONTAINMENT SYSTEMS (Cont.)

B. Standby Gas Treatment System and Control Room High Efficiency Air Filtration System (Cont.)

2. The results of the laboratory carbon sample analysis shall show ≥95% methyl iodide removal at a velocity within 10% of system design, 0.5 to 1.5 mg/m3 inlet methyl iodide concentration, ≥70% R.H. and ≥190°F. The analysis results are to be verified as acceptable within 31 days after sample removal, or declare that train inoperable and take the actions specified in 3.7.B.1.c.

c. From and after the date that one train of the Standby Gas Treatment System is made or found to be inoperable for any reason, continued reactor operation, irradiated fuel handling, or new fuel handling over the spent fuel pool is permissible only during the succeeding seven days providing that within 2 hours all active components of the other standby gas treatment train are verified to be operable and the diesel generator associated with the operable train is operable.

If the system is not made fully operable within 7 days, reactor shutdown shall be initiated and the reactor shall be in cold shutdown within the next 36 hours and fuel handling operations shall be terminated within 2 hours.

Fuel handling operations in progress may be completed.

SURVEILLANCE REQUIREMENTS

4.7 CONTAINMENT SYSTEMS (Cont.)

B. Standby Gas Treatment System and Control Room High Efficiency Air Filtration System (Cont.)

each branch of the standby gas treatment system shall be demonstrated, with Specification 3.7.B.1.d satisfied.

5. Each train of the standby gas treatment system shall be operated for at least 15 minutes per month.

6. The tests and analysis of Specification 3.7.B.1.b.2 shall be performed after every 720 hours of system operation.

b. 1. In-place cold DOP testing shall be performed on the HEPA filters after each completed or partial replacement of the HEPA filter bank and after any structural maintenance on the HEPA filter system housing which could affect the HEPA filter bank bypass leakage.

2. Halogenated hydrocarbon testing shall be performed on the charcoal adsorber bank after each partial or complete replacement of the charcoal adsorber bank or after any structural maintenance on the charcoal adsorber housing which could affect the charcoal adsorber bank bypass leakage.

3.7 CONTAINMENT SYSTEMS (Cont.)

B. Standby Gas Treatment System and Control Room High Efficiency Air Filtration System (Cont.)

d. Fans shall operate within ± 10% of 4000 cfm.

e. From and after the date that one train of the Standby Gas Treatment System is made or found to be inoperable for any reason during Refuel Outages, refueling operations are permissible only during the succeeding 7 days providing that within 2 hours all active components of the other train are verified to be operable and the diesel generator associated with the operable train is operable.

If the system is not made fully operable within 7 days,

i) place the operable train in operation immediately

or

ii) suspend movement of irradiated fuel assemblies in secondary containment or new fuel handling over the spent fuel pool or core.

Any fuel assembly movement in progress may be completed.

4.7 CONTAINMENT SYSTEMS (Cont.)

B. Standby Gas Treatment System and Control Room High Efficiency Air Filtration System (Cont.)

LIMITING CONDITIONS FOR OPERATION

3.7 CONTAINMENT SYSTEMS (Cont.)

B. Standby Gas Treatment System and Control Room High Efficiency Air Filtration System (Cont.)

2. Control Room High Efficiency Air Filtration System

a. Except as specified in Specification 3.7.B.2.c or 3.7.B.2.e below, both trains of the Control Room High Efficiency Air Filtration System used for the processing of inlet air to the control room under accident conditions shall be operable when in the Run, Startup, and Hot Shutdown MODES, during movement of irradiated fuel assemblies in the secondary containment, and during movement of new fuel over the spent fuel pool, and during CORE ALTERATIONS, and during operations with a potential for draining the reactor vessel (OPDRVs),

or

the reactor shall be in cold shutdown within the next 36 hours.

b. 1. The results of the in-place cold DOP tests on HEPA filters shall show ≥99% DOP removal. The results of the halogenated hydrocarbon tests on charcoal adsorber banks shall show ≥99% halogenated hydrocarbon removal when test results are extrapolated to the initiation of the test.

2. The results of the laboratory carbon sample analysis shall show ≥95% methyl iodide removal at a velocity within 10% of system design, 0.05 to 0.15 mg/m3 inlet methyl iodide concentration, ≥70% R.H., and ≥125°F. The analysis results are to be verified as acceptable within 31 days after sample removal, or declare that train inoperable and take the actions specified in 3.7.B.2.c.

SURVEILLANCE REQUIREMENTS

4.7 CONTAINMENT SYSTEMS (Cont.)

B. Standby Gas Treatment System and Control Room High Efficiency Air Filtration System (Cont.)

2. Control Room High Efficiency Air Filtration System

a. At least once per operating cycle the pressure drop across each combined filter train shall be demonstrated to be less than 6 inches of water at 1000 cfm or the calculated equivalent.

b. 1. The tests and analysis of Specification 3.7.B.2.b shall be performed once per operating cycle or following painting, fire or chemical release in any ventilation zone communicating with the system while the system is operating.

2. In-place cold DOP testing shall be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing which could affect the HEPA filter bank bypass leakage.

3. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing which could affect the charcoal adsorber bank bypass leakage.

4. Each train shall be operated with the heaters in automatic for at least 15 minutes every month.

LIMITING CONDITIONS FOR OPERATION

3.7 CONTAINMENT SYSTEMS (Cont.)

B. Standby Gas Treatment System and Control Room High Efficiency Air Filtration System (Cont.)

c. From and after the date that one train of the Control Room High Efficiency Air Filtration System is made or found to be inoperable for any reason, reactor operation, irradiated fuel handling, or new fuel handling over the spent fuel pool is permissible only during the succeeding 7 days providing that within 2 hours all active components of the other CRHEAF train are verified to be operable and the diesel generator associated with the operable train is operable. If the system is not made fully operable within 7 days, reactor shutdown shall be initiated and the reactor shall be in cold shutdown within the next 36 hours and fuel handling operations shall be terminated within 2 hours. Fuel handling operations in progress may be completed.

d. Fans shall operate within ± 10% of 1000 cfm.

e. From and after the date that one train of the Control Room High Efficiency Air Filtration System is made or found to be inoperable for any reason during Refuel Outages, refueling operations are permissible only during the succeeding 7 days providing that within 2 hours all active components of the other train are verified to be operable and the diesel generator associated with the operable train is operable.

If the system is not made fully operable within 7 days,

SURVEILLANCE REQUIREMENTS

4.7 CONTAINMENT SYSTEMS (Cont.)

B. Standby Gas Treatment System and Control Room High Efficiency Air Filtration System (Cont.)

5. The test and analysis of Specification 3.7.B.2.b.2 shall be performed after every 720 hours of system operation.

c. At least once per operating cycle demonstrate that the inlet heaters on each train are operable and capable of an output of at least 14 kw.

d. Perform an instrument functional test on the humidistats controlling the heaters once per operating cycle.

3.7 CONTAINMENT SYSTEMS (Cont.)

i) perform surveillance 4.7.B.2.b.4 for the operable CRHEAF every 24 hours

or

ii) suspend movement of irradiated fuel assemblies in secondary containment or new fuel handling over the spent fuel pool or core.

Any fuel assembly movement in progress may be completed.

C. Secondary Containment

1. Secondary containment shall be OPERABLE when in the Run, Startup and Hot Shutdown MODES, during movement of irradiated fuel assemblies in the secondary containment, and during movement of new fuel over the spent fuel pool, and during CORE ALTERATIONS, and during operations with a potential for draining the reactor vessel (OPDRVs).

2. a. With Secondary Containment inoperable when in the Run, Startup and Hot Shutdown MODES, restore Secondary Containment to OPERABLE status within 4 hours.

   b. Required Action and Completion Time of 2.a not met, be in Hot Shutdown in 12 hours AND Cold Shutdown within 36 hours.

   c. With Secondary Containment inoperable during movement of irradiated fuel assemblies in the secondary containment, and during movement of new fuel over the spent fuel pool, and during CORE ALTERATIONS, and during OPDRVs, immediately
      1. Suspend movement of irradiated fuel assemblies in the secondary containment.
      AND
      2. Suspend movement of new fuel over the spent fuel pool.
      AND
      3. Suspend CORE ALTERATIONS.
      AND
      4. Initiate action to suspend OPDRVs.

4.7 CONTAINMENT SYSTEMS (Cont.)

C. Secondary Containment

1. Each refueling outage prior to refueling, secondary containment capability shall be demonstrated to maintain 1/4 inch of water vacuum under calm wind (5 mph) conditions with a filter train flow rate of not more than 4000 cfm.

LIMITING CONDITION FOR OPERATION

3.9 AUXILIARY ELECTRICAL SYSTEM (Cont)

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 remain 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 remain 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 Specifications 3.4.B.1, 3.5.F.1, 3.7.B.1.c, 3.7.B.1.e, 3.7.B.2.c, and 3.7.B.2.e 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

SURVEILLANCE REQUIREMENTS

4.9 AUXILIARY ELECTRICAL SYSTEM (Cont)

A. Auxiliary Electrical Equipment Surveillance (Cont)

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.

   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 18 months 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

BASES:

3/4.7 CONTAINMENT SYSTEMS (Cont.)

Tests of impregnated charcoal identical to that used in the filters indicate that a shelf life of five years leads to only minor decreases in methyl iodide removal efficiency. Hence, the frequency of laboratory carbon sample analysis is adequate to demonstrate acceptability. Since adsorbers must be removed to perform this analysis this frequency also minimizes the system out of service time as a result of surveillance testing. In addition, although the halogenated hydrocarbon testing is basically a leak test, the adsorbers have charcoal of known efficiency and holding capacity for elemental iodine and/or methyl iodide, the testing also gives an indication of the relative efficiency of the installed system. The 31 day requirement for the ascertaining of test results ensures that the ability of the charcoal to perform its designed function is demonstrated and known in a timely manner.

The required Standby Gas Treatment System flow rate is that flow, less than or equal to 4000 CFM which is needed to maintain the Reactor Building at a 0.25 inch of water negative pressure under calm wind conditions. This capability is adequately demonstrated during Secondary Containment Leak Rate Testing performed pursuant to Technical Specification 4.7.C.1.c.

The test frequencies are adequate to detect equipment deterioration prior to significant defects, but the tests are not frequent enough to load the filters or adsorbers, thus reducing their reserve capacity too quickly. The filter testing is performed pursuant to appropriate procedures reviewed and approved by the Operations Review Committee pursuant to Section 6 of these Technical Specifications. The in-place testing of charcoal filters is performed by injecting a halogenated hydrocarbon into the system upstream of the charcoal adsorbers. Measurements of the concentration upstream and downstream are made. The ratio of the inlet and outlet concentrations gives an overall indication of the leak tightness of the system. A similar procedure substituting dioctyl phthalate for halogenated hydrocarbon is used to test the HEPA filters.

Pressure drop tests across filter and adsorber banks are performed to detect plugging or leak paths though the filter or adsorber media. Considering the relatively short times the fans will be run for test purposes, plugging is unlikely and the test interval of once per operating cycle is reasonable.

System drains and housing gasket doors are designed such that any leakage would be inleakage from the Standby Gas Treatment System Room. This ensures that there will be no bypass of process air around the filters or adsorbers.

Only one of the two Standby Gas Treatment Systems (SBGTS) is needed to maintain the secondary containment at a 0.25 inch of water negative pressure upon containment isolation. If one system is made or found to be inoperable, there is no immediate threat to the containment system performance and reactor operation or refueling activities may continue while repairs are being made. In the event one SBGTS is inoperable, the redundant system's active components will be verified to be operable within 2 hours. This substantiates the availability of the operable system and justifies continued reactor or refueling operations.

During refueling outages, if the inoperable train is not restored to operable status within the required completion time, the operable train should immediately be placed in operation. This action ensures that the remaining train is operable, that no failures that could prevent automatic actuation have occurred, and that any other failure would be readily detected. An alternative is to suspend fuel movement, thus, placing the plant in a condition that minimizes risk.

B.2 Control Room High Efficiency Air Filtration System (Cont.)

The test frequencies are adequate to detect equipment deterioration prior to significant defects, but the tests are not frequent enough to load the filters or adsorbers, thus reducing their reserve capacity too quickly. The filter testing is performed pursuant to appropriate procedures reviewed and approved by the Operations Review Committee pursuant to Section 6 of these Technical Specifications. The in-place testing of charcoal filters is performed by injecting a halogenated hydrocarbon into the system upstream of the charcoal adsorbers. Measurements of the concentration upstream and downstream are made. The ratio of the inlet and outlet concentrations gives an overall indication of the leak tightness of the system. A similar procedure substituting dioctyl phthalate for halogenated hydrocarbon is used to test the HEPA filters.

Air flow through the filters and charcoal adsorbers for 15 minutes each month assures operability of the system. Since the system heaters are automatically controlled, the air flowing through the filters and adsorbers will be ≤70% relative humidity and will have the desired drying effect.

If one train of the system is made or found to be inoperable, there is no immediate threat to the control room, and reactor operation or fuel handling may continue for a limited period of time while repairs are being made. In the event one CRHEAF train is inoperable, the redundant system's active components will be verified to be operable within 2 hours. During refueling outages, if the inoperable train is not restored to operable status within the required completion time, refueling operations may continue provided the operable CRHEAF train is placed in the pressurization mode daily. This action ensures that the remaining train is operable, that no failures that would prevent actuation will occur, and that any active failure will be readily detected. An alternative is to suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. If both trains of the CRHEAF system are inoperable, the reactor will be brought to a condition where the Control Room High Efficiency Air Filtration System is not required.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 170 TO FACILITY OPERATING LICENSE NO. DPR-35

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

DOCKET NO. 50-293

1.0 INTRODUCTION

By application dated April 25, 1996, as supplemented on December 23, 1996, Boston Edison Company (BECo or the licensee) requested changes to the Technical Specifications (TSs) for Pilgrim Nuclear Power Station. The proposed changes will revise the definition of Operable-Operability, revise TSs and associated Bases Section for TSs 3.9.B.2, 3.9.B.3, "Auxiliary Electrical System," TS 3.4.B.1, "Standby Liquid Control System," TSs 3.7.B.1.a, c, and e, and 3.7.b.2.a, c, and e, "Standby Gas Treatment System and Control Room High Efficiency Air Filtration System," and TSs 4.5.F.1, "Core and Containment Cooling Systems," and delete TS 3.7.B.1.f, "Standby Gas Treatment System and Control Room High Efficiency Air Filtration System." The December 23, 1996, letter provided clarifying information and additional changes that did not change the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

The licensee's April 25, 1996, letter to the NRC proposes to reformat and modify various TS Sections as noted above to make them consistent with the standard technical specifications (STS). The staff review compared the current requirements with the proposed requirements to ensure that either current TS limits are maintained or that a reasonable safety bases exist for adopting the STS requirements.

2.1 Requirements Maintained or Changed by the Proposed TS Change

The staff compared the current TS requirements with the proposed TS to ensure all the original requirements are maintained or a basis for modification or deletion is provided. An evaluation of the proposed TS changes are provided by the notes that follow. If a note does not appear, the staff has concluded that the original TS requirements have been maintained. Below is a table of the current requirements and their equivalent in the proposed TS:

DEFINITIONS

CURRENT REQUIREMENTS	Location in Proposed TS
1.0 Definition of Operability	Definition of Operability (Note 1)

NOTES

1. The current Pilgrim "Operable-Operability" definition considers systems/subsystems as operable provided that both sources of onsite (emergency) and offsite (normal) AC power are available. Thus, when one source of power is not available, Pilgrim's current definition requires the supported systems to be declared inoperable. The revised definition redefines the AC power needs to allow either onsite or offsite power available for systems/subsystems to be considered operable. Individual emergency diesel generator (EDG) Limiting Conditions for Operation (LCO) will be incorporated into specific system specifications to ensure an operable emergency power source is always available to the operable systems/subsystems. Reducing the need for both onsite and offsite power sources provides additional operational flexibility by allowing redundant systems/subsystems to still be considered "operable" within the requirements of their functional operability requirements. The licensee will adopt the current definition from the STSs. The NRC staff has reviewed TSs 3.9.B.1, 2, 3, and 4, and concluded that with the adoption of the standard definition and the proposed revisions to TSs 3.4.B.1, 3.7.B.1.c, 3.7.B.1.e, 3.7.B.2.c, and 3.7.B.2.e, system operability would require one safety train with both onsite and offsite AC sources and the redundant train with either onsite or offsite AC. Based on the above, the staff concludes that the change to the definition of operable is acceptable and is consistent with the STSs.

Standby Liquid Control (SLC) System TS Changes

CURRENT REQUIREMENTS	Location in Proposed TS
3.4.B.1 Operation with Inoperable Components	3.4.B.1 (Note 2)

NOTES

2. The proposed change to the LCO during plant operation adds a new condition requiring the EDG associated with the operable train of SLC to be operable. Although the revised definition of "Operable-Operability" would only require either the normal or emergency power sources to be available under these circumstances, the remaining train of SLC will include the requirement to have their associated emergency power source available. This provides assurance that the operable train will have an emergency source of power in the unlikely event of a loss of offsite power. Based on the above, the staff concludes that this TS change is acceptable and meets the intent of the STS.

Standby Gas Treatment System TS Changes

CURRENT REQUIREMENTS		Location in Proposed TS
3.7.B.1.a	Applicability	3.7.B.1.a (Note 3)
3.7.B.1.b.1	DOP Tests on HEPA Filters	3.4.B.1.b.1
3.7.B.1.b.2	Carbon Sample Analysis	3.7.B.1.b.2
3.7.B.1.c	Operation with Inoperable Components	3.7.B.1.c (Note 4)
3.7.B.1.d	Fan Speed	3.7.B.1.d
3.7.B.1.e	Fuel Movement	Deleted (Note 5)
3.7.B.1.f	Operation with Inoperable Components-Refueling	3.7.B.1.e (Note 6)

NOTES

3. TS 3.7.B.1.a will be revised to eliminate the association to the diesel generators based on the proposed revision to the definition of "Operable-Operability" (See Note #1). The action requirements will be relocated to TS 3.7.B.1.c for reactor operation when the primary containment and reactor vessel are closed. A new requirement 3.7.B.1.e will be added to address actions to be taken during refueling operations. The proposed TS will reflect the change that TS requirements 3.7.B.1.c, e, and f will be revised/replaced by new TS requirements 3.7.B.1.c and e. The licensee referenced the secondary containment TS to define the applicable modes. The staff has discussed this with BECo and determined that statement of the applicable modes would provide a more definitive TS. By letter dated December 23, 1996, the licensee modified the proposed TS to add the specific Modes of Applicability. Based on the above, the staff concludes that these TS changes are acceptable and meets the intent of the STS.

   The staff has also noted that the licensee proposed to delete both trains inoperable action statement. By letter dated December 23, 1996, the licensee has agreed not to delete this 36-hour shutdown action. In addition, the action will be made consistent with 3.7.B.1.c which requires the plant to be in cold shutdown in 36 hours.

4. The proposed changes to the LCO during plant operation are mostly editorial except for the addition of the new condition requiring the EDG associated with the operable train of SGT to be operable. This condition will be added as a result of the revised EDG LCO as discussed previously in Note #1. Although the revised definition of "Operable-Operability" would only require either the normal or emergency power sources to be available under these circumstances, the remaining train of SGT will include the requirement to have the associated emergency power source available. This provides assurance that the operable train will still have an emergency source of power in the unlikely event of a loss of offsite power. The 7 day allowed outage time is based on consideration of such factors as the availability of the operable redundant SGT

subsystem and the low probability of a DBA occurring during this period. The 7 days is consistent with the current TSs and the STS. The required action time of 36 hours for shutdown was relocated from TS 3.7.B.1.a and modified to require cold shutdown to be consistent with the STS. The allowed completion time is based on operating experience to allow the plant to reach the required plant condition from full power in an orderly manner without challenging plant conditions. The 36 hours is consistent with the current TSs and the STS. A condition not addressed by the STS is fuel handling operations during reactor operation. In this case, BECo has proposed that all fuel handling operations be terminated in 2 hours upon not meeting the action statement. The 2 hours will provide sufficient time for fuel handling operations in progress to be completed. Based on the above, the staff concludes that these TS changes are acceptable and meets the intent of the STS.

The staff has informed BECo that the requirement to test redundant components was included in early TS to provide a positive demonstration that a loss of safety function had not occurred. This requirement can now be deleted because the added assurance by testing is not sufficient to justify the loss of safety function during the test, provided required periodic surveillance testing is current and that there are no known reasons to suggest that the alternate train is inoperable. The periodic surveillance tests and the proposed verifications confirm that the redundant systems/components are operable and are sufficient to demonstrate the operability of the redundant system/component. These operability verifications can be accomplished by examination of appropriate plant records; e.g., surveillance test records, equipment tagging records, operating logs, and shift turnover records. The operability verification would involve an assessment within 2 hours of the cause of the system inoperability and a judgment as to the likelihood that the opposite train is similarly affected. By letter dated December 23, 1996, the licensee proposed to modify the proposed TS to delete the testing of the redundant train when one train has been declared inoperable. The staff concludes that this TS change is consistent with current staff guidance on the testing of redundant trains and therefore is acceptable.

5. Current TS 3.7.B.1.e will be deleted. When one train is inoperable, this TS prevented fuel movement from being started. Provisions were added to allow fuel movement with one inoperable train of SGT for 7 days as long as the remaining train of SGT is verified operable within 2 hours, and the EDG associated with the operable train is operable. Based on the above, the staff concludes that this TS change is acceptable and is consistent with the STS.

6. With the change in the definition of Operability, TS 3.7.B.1.f is no longer applicable as the requirement to have both trains of EDG during refueling is no longer required. Existing SGT TS 3.7.B.1.f will be replaced by the proposed change to TS 3.7.B.1.e, which makes the compensatory measures formerly contained in (f) unnecessary. Former references to (f) are revised to (e) in TS 3.7.B.1.a and 3.7.B.1.c. Previous TS 3.7.B.1.e provided conditions for not entering the SGT LCO when the train did not have its safety-related bus and/or EDG. New TS 3.7.B.1.e provides an LCO for an inoperable SGT train during refueling. Refueling operations are allowed to continue for 7 days based on the verification of operability of the remaining train within 2 hours and the requirement that it's associated EDG also be operable. With one train out of service, a single failure could possibly prevent the remaining train from achieving its stated design purpose. The 7-day completion time is based on consideration of such factors as the availability of the operable redundant SGT subsystem and the low probability of a DBA occurring during this period. After 7 days, the operable SGT system must be placed in operation for the refueling activities to continue. This action places the train in the active operational mode thereby providing the safety actions essential to avoiding unacceptable safety results associated with abnormal operational transients and accidents. In this condition, the remaining operable SGT subsystem is adequate to perform the required radioactivity release control function. In addition, because the SGT is designed to automatically start upon receipt of a high radiation signal in the secondary containment, operating the system eliminates a potential failure mechanism. If the SGT system is not placed in operation all fuel activities must be suspended immediately. Based on the above, the staff concludes that this TS change is acceptable and is consistent with the STS.

Control Room High Efficiency Air Filtration (CRHEAF) System TS Changes

CURRENT REQUIREMENTS		Location in Proposed TS
3.7.B.2.a	Applicability	3.7.B.2.a (Note 7)
3.7.B.2.b.1	DOP Tests on HEPA Filters	3.7.B.2.b.1
3.7.B.2.b.2	Carbon Sample Analysis	3.7.B.2.b.2
3.7.B.2.c	Operation with Inoperable Components	3.7.B.2.c (Note 8)
3.7.B.2.d	Fan Speed	3.7.B.2.d
3.7.B.2.e	Operation with Inoperable Components-Refueling	3.7.B.2.e (Note 9)

NOTES

7. TS 3.7.B.2.a will be revised to eliminate the association to the diesel generators based on the proposed revision to the definition of "Operable-Operability" (See Note #1). The proposed TS will reflect the change that TS requirements 3.7.B.2.c and e will be revised/replaced by new TS requirements 3.7.B.2.c and e. The action requirement will be relocated to TS 3.7.B.2.c for reactor operation and when the primary containment and reactor vessel are

closed. A new requirement 3.7.B.2.e will be added to address actions to be taken during refueling operations. The licensee referenced the secondary containment TS to define the applicable modes. The staff has discussed this with BECo and determined that statement of the applicable modes would provide a more definitive TS. By letter dated December 23, 1996, the licensee modified the proposed TS to add the specific Modes of Applicability. Based on the above, the staff concludes that these TS changes are acceptable and meets the intent of the STS.

The staff has also noted that the action statement for both trains inoperable does not exist. By letter dated December 23, 1996, the licensee has agreed not delete this 36 hour shutdown action. In addition, the action will be made consistent with 3.7.B.1.c which requires the plant to be in cold shutdown in 36 hours.

8. The proposed changes to the LCO during plant operation are mostly editorial except for the addition of the new condition requiring the EDG associated with the operable train of CRHEAF to be operable. This condition is added as a result of the revised EDG LCO as discussed previously in Note # 1. Although the revised definition of "Operable-Operability" would only require either the normal or emergency power sources to be available under these circumstances, the remaining train of CRHEAF will include the requirement to have the associated emergency power source available. This provides assurance that the operable train will still have an emergency source of power in the unlikely event of a loss of offsite power. The 7-day allowed outage time is based on consideration of such factors as the availability of the operable redundant CRHEAF subsystem and the low probability of a DBA occurring during this period. The 7 days is consistent with the current TSs and the STS. A condition not addressed by the STS is fuel handling operations during reactor operation. In this case, BECo has proposed that all fuel handling operations be terminated in 2 hours upon not meeting the action statement. The 2 hours will provide sufficient time for fuel handling operations in progress to be completed. Based on the above, the staff concludes that these TS changes are acceptable and meets the intent of the STS.

The staff has informed BECo that the requirement to test redundant components was included in early TS to provide a positive demonstration that a loss of safety function had not occurred. This requirement can now be deleted because the added assurance by testing is not sufficient to justify the loss of safety function during the test, provided required periodic surveillance testing is current and that there are no known reasons to suggest that the alternate train is inoperable. The periodic surveillance tests and the proposed verifications that the redundant systems/components are operable are sufficient to demonstrate the operability of the redundant system/component. These operability verifications can be accomplished by examination of appropriate

plant records; e.g., surveillance test records, equipment tagging records, operating logs, and shift turnover records. The operability verification would involve an assessment within 2 hours of the cause of the system inoperability and a judgment as to the likelihood that the opposite train is similarly affected. By letter dated December 23, 1996, the licensee proposed to modify the proposed TS to delete the testing of the redundant train when one train has been declared inoperable. The staff concludes that this TS change is consistent with current staff guidance on the testing of redundant trains and therefore is acceptable.

9. With the change in the definition of Operability, TS 3.7.B.2.e is no longer applicable as the requirement to have both trains of EDG during refueling available is no longer required. CRHEAF TS 3.7.B.2.e will be replaced by a new TS 3.7.B.2.e, which makes the compensatory measures formerly contained in (e) unnecessary. New TS 3.7.B.2.e will provide a LCO for an inoperable CRHEAF train during refueling. Refueling operations are allowed to continue for 7 days based on the verification of operability of the remaining train within 2 hours and the requirement that its associated EDG also be operable. With one train out of service, a single failure could possibly prevent the remaining train from achieving its stated design purpose. The 7-day completion time is based on consideration of such factors as the availability of the operable redundant CRHEAF subsystem and the low probability of a DBA occurring during this period. After 7 days, the operable CRHEAF subsystem must be operated for 15 minutes every 24 hours for the refueling activities to continue. The CRHEAF has no automatic start signals and initiation is manual. The CRHEAF has credible operating history on demand and continuous operation would not provide any additional assurance of system operability. In addition, the CRHEAF is of lower capacity than the normal HVAC system for the control room and extended use of the CRHEAF could make the control room uncomfortable for normal refueling activities. The remaining operable CRHEAF subsystem is adequate to perform the required radioactivity release control function. If the CRHEAF subsystem is not operated daily, all fuel activities must be suspended immediately. Based on the above, the staff concludes that this TS change is acceptable and is consistent with the STS.

AUXILIARY ELECTRICAL SYSTEM TS CHANGES

CURRENT REQUIREMENTS		Location in Proposed TS
3.9.B.1	Loss of incoming power	3.9.B.1 (Note 10)
3.9.B.2	Loss of Startup and Shutdown Transformers	3.9.B.2 (Note 10)
3.9.B.3	System Specific LCOs	3.9.B.3 (Note 11)

NOTES

10. The TS 3.9.B.1 and 2 requirements to demonstrate both EDGs and

associated emergency buses operable will be deleted. This change is based on the NRC guidance provided in item 10.1 of Generic Letter 93-05, "Line-Item Technical Specification Improvements to Reduce Surveillance Requirements for Testing During Power Operation." The requirement to test redundant components was included in early TS to provide a positive demonstration that a loss of safety function had not occurred. This change is similar as it requires the demonstration of onsite power on the loss of an offsite power source. The logic for the testing of redundant trains can be applied to this situation also. The requirement for testing of the EDGs can now be deleted because the added assurance by testing is not sufficient to justify the loss of safety function during the test, provided required periodic surveillance testing is current. The periodic surveillance tests that the redundant systems/components are operable are sufficient to demonstrate the operability of the redundant system/component. These operability verifications can be accomplished by examination of appropriate plant records; e.g., surveillance test records, equipment tagging records, operating logs, and shift turnover records. The staff agrees that the proposed TS to delete the testing of the EDG when offsite power has been declared inoperable is acceptable.

11. TS 3.9.B.3 will be revised to include references to other sections in the TS that require continued operability of the remaining train of equipment that depends on the operable diesel generator as a source of emergency power. Adding additional system operability requirements to TS 3.9.B.3 will provide a positive measure to prevent entry into the EDG LCO if any redundant system that relies on the operable diesel generator for its source of emergency power is out of service. The following systems were added SLC, SGT, and CRHEAF to the TS which currently includes the low pressure cooling and containment cooling systems. This logic is consistent with the STS which requires an action to verify that if a train has an inoperable power source that the redundant train does not have an inoperable feature which would leave the plant with the loss of a required feature (See Note 1). Based on the above, the staff concludes that this TS change is acceptable and is consistent with the STS.

SURVEILLANCE REQUIREMENTS

CORE AND CONTAINMENT COOLING SYSTEMS

CURRENT SURVEILLANCE		Location in Proposed TS
4.5.F.1	1 Diesel Inoperable Surveillance	4.5.F.1 (Note 12)

NOTES

12. TS 4.5.F.1 will be revised to delete the daily testing of the operable diesel generator when the other EDG becomes inoperable

(See Note 10). Instead, a determination must be made within 24 hours that a common cause failure does not exist for the operable EDG or the diesel generator must be tested. Actions are also added to verify breaker alignment and indicated power availability for each offsite circuit. This verification assures AC power availability without compromising the AC power distribution. By letter dated December 23, 1996, the licensee proposed to correct a typographical error the staff discoverd by changing the surveillance to be performed from 4.9.A.1.2 to 4.9.A.1.a. Surveillance 4.9.A.1.2 is associated with breaker alignment and is an incorrect reference. In addition, by letter dated December 25, 1996, the licensee has added the words "within 1 hour" and "thereafter" to the breaker alignment sentence to be consistent with the STS. Based on the above, the staff concludes that this TS change is acceptable and is consistent with the STS.

STANDBY GAS TREATMENT SYSTEM

CURRENT SURVEILLANCE		Location in Proposed TS
4.7.B.1.a	General Operability Test	4.7.B.1.a
4.7.B.1.b	In-place cold DOP Testing	4.7.B.1.b

CONTROL ROOM HIGH EFFICIENCY AIR FILTRATION SYSTEM

CURRENT SURVEILLANCE		Location in Proposed TS
4.7.B.2.a	Pressure Drop Tests	4.7.B.1.a
4.7.B.2.b	General Operability Test	4.7.B.1.b
4.7.B.2.c	Inlet Heaters Test	4.7.B.1.c
4.7.B.2.d	Humidistats Test	4.7.B.1.d

The staff has concluded that the proposed TS specify more clearly when SBT and CRHEAF is required, what actions to take if these systems are inoperable, and time frames for completing the actions. The removal of testing of redundant trains is consistent with current NRC policy. Based on the above, the staff concludes that the proposed TSs enhance the current TS by making them more definitive and supplementing them with action statements and required completion times and, therefore, the changes are acceptable. In addition, the staff has reviewed these proposed changes and concluded that the proposed changes are consistent with the STS.

3.0 BASES SECTION

The licensee has revised the associated BASES sections related to the above TS changes for the SGT and CHREAF systems. The proposed changes modify the BASES section to describe the action taken should an inoperable train of SGT or CRHEAF be inoperable for greater than 7 days during a refueling. As noted above the proposed TS changes are consistent with the STS and the BASES sections have been changed to reflect the new requirements. The new BASES pages B3/4.7-10 and 12 are included with the new TS pages.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Massachusetts State official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (61 FR 31172). 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.

7.0 CONCLUSION

The Commission 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: A. Wang

Date: February 10, 1997