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

METROPOLITAN EDISON COMPANY

JERSEY CENTRAL POWER AND LIGHT COMPANY

PENNSYLVANIA ELECTRIC COMPANY

DOCKET NO. 50-289

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 43
License No. DPR-50

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Metropolitan Edison Company, Jersey Central Power and Light Company and Pennsylvania Electric Company (the licensees), dated January 27, 1978, as supplemented by letter dated July 17, 1978, 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 2.C.(2) of Facility Operating License No. DPR-50 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 43 , 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 its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 23, 1978

ATTACHMENT TO LICENSE AMENDMENT NO. 43

FACILITY OPERATING LICENSE NO. DPR-50

DOCKET NO. 50-289

Revise the Appendix A Technical Specifications as follows:

Remove Pages	Insert Pages
3-19	3-19
3-20	3-20

The changed areas on the revised pages are shown by marginal lines.

3.2 MAKEUP AND PURIFICATION AND CHEMICAL ADDITION SYSTEMS

Applicability

Applies to the operational status of the makeup and purification and the chemical addition systems.

Objective

To provide for adequate boration under all operating conditions to assure ability to bring the reactor to a cold shutdown condition.

Specification

The reactor shall not be critical unless the following conditions are met:

3.2.1 Two makeup and purification pumps are operable except as specified in 3.3.2.

3.2.2 A source of concentrated boric acid solution, in addition to the borated water storage tank, is available and operable. This can be either:

a. The boric acid mix tank containing at least the equivalent of 800 ft^3 of 8700 ppm boron as boric acid solution with a temperature of at least 10° F above the crystallization temperature. System piping and valves necessary to establish a flow path from the tank to the makeup and purification system shall also be operable and shall have at least the same temperature requirement as the boric acid mix tank. One associated boric acid pump shall be operable.

b. A reclaimed boric acid storage tank containing at least the equivalent of 800 ft^3 of 8700 ppm boron as boric acid solution with a temperature of at least 10° F above the crystallization temperature. System piping and valves necessary to establish a flow path from the tank to the makeup and purification system shall also be operable and shall have at least the same temperature requirement as the reclaimed boric acid tank. One associated reclaimed boric acid pump shall be operable.

Bases

The makeup and purification system and chemical addition systems provide control of the reactor coolant boron concentration. (1) This is normally accomplished by using any of the three makeup and purification pumps in series with a boric acid pump associated with the boric acid mix tank or a reclaimed boric acid pump associated with a reclaimed boric acid storage tank. The alternate method of boration will be the use of the makeup and purification pumps taking suction directly from the borated water storage tank. (2)

The quantity of boric acid in storage from either of the three above mentioned sources is sufficient to borate the reactor coolant system to a one percent subcritical margin in the cold condition at the worst time in core life with a stuck control rod assembly. Minimum volumes (including a 10 percent safety factor) of 800 ft^3 of 8700 ppm boron as concentrated boric acid solution in the boric acid mix tank or in a reclaimed boric acid storage tank or 26,500 gallons of 2270 ppm boron as boric acid solution in the borated water storage tank(3) will each satisfy this requirement. The specification assures that at least two of these supplies are available whenever the reactor is critical so that a single failure will not prevent boration to a cold condition. The minimum volumes of boric acid solution given include the boron necessary to account for xenon decay.

The primary method of adding boron to the reactor coolant system is to pump the concentrated boric acid solution (8700 ppm boron, minimum) into the makeup tank using either the 10 gpm boric acid pumps or the 30 gpm reclaimed boric acid pumps. Using only one of the two 10 gpm boric acid pumps, the required volume can be injected in less than ten hours. The alternate method of addition is to inject boric acid from the borated water storage tank using the makeup and purification pumps. The required 26,500 gallons of boric acid can be injected in less than three and one half hours using only one of the makeup and purification pumps.

Concentration of boron in the boric acid mix tank or a reclaimed boric acid storage tank may be higher than the concentration which would crystallize at ambient conditions. For this reason, the boric acid mix tank is provided with an immersion electric heating element and the reclaimed boric acid tanks are provided with low pressure steam heating jackets to maintain the temperature of their contents well above (10° F or more) the crystallization temperature of the boric acid solution contained in them. Both types of heaters are controlled by temperature sensors immersed in the solution contained in the tanks. Further, all piping, pumps and valves associated with the boric acid mix tank and the reclaimed boric acid storage tanks to transport boric acid solution from them to the makeup and purification system are provided with redundant electrical heat tracing to ensure that the boric acid solution will be maintained 10° F or more above its crystallization temperature. The electrical heat tracing is controlled by the temperature of the external surfaces of the piping systems. Once in the makeup and purification system, the boric acid solution is sufficiently well mixed and diluted so that normal system temperatures assure boric acid solubility.

References

(1) FSAR, Sections 9.1 and 9.2

(2) FSAR, Figure 6.2

(3) Technical Specification 3.3