March 5, 1991

Docket No. 50-289

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Mr. T. G. Broughton, Vice President
and Director - TMI-1
GPU Nuclear Corporation
Post Office Box 480
Middletown, Pennsylvania 17057

Dear Mr. Broughton:

SUBJECT: ISSUANCE OF AMENDMENT (TAC NO. 77737)

The Commission has issued the enclosed Amendment No. 160 to Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit No. 1, in response to your letter dated September 25, 1990.

The amendment revises the criteria for replacement of the flexible seat for the reactor building purge valve.

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/

Ronald W. Hernan, Senior Project Manager
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 160 to DPR-50
2. Safety Evaluation

cc w/enclosures:
See next page

DOCUMENT NAME: 77737 AMD

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Date:	2/15/91	2/12/91	2/15/91	2/22/91

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NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

METROPOLITAN EDISON COMPANY

JERSEY CENTRAL POWER & LIGHT COMPANY

PENNSYLVANIA ELECTRIC COMPANY

GPU NUCLEAR CORPORATION

DOCKET NO. 50-289

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 160
License No. DPR-50

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

   A. The application for amendment by GPU Nuclear Corporation, et al. (the licensee) dated September 25, 1990, 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 Appendix A, as revised through Amendment No. 160, are hereby incorporated in the license. GPU Nuclear Corporation shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Ronald W. Hernan for J. Stolz

John F. Stolz, Director
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 5, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 160

FACILITY OPERATING LICENSE NO. DPR-50

DOCKET NO. 50-289

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
4-34	4-34
4-34b	4-34b

4.4.1.5 Reactor Building Modifications

Any major modification or replacement of components affecting the reactor building integrity shall be followed by either an integrated leak rate test or a local leak test, as appropriate, and shall meet the acceptance criteria of 4.4.1.1.6 and 4.4.1.2.3, respectively.

4.4.1.6 Operability of Access Hatch Interlocks

1. At least once per six months the operability of the personnel and emergency hatch door interlocks and the associated control room annunciator circuits shall be determined. If the interlock permits both doors to be open at the same time or does not provide accurate status indication in the control room the interlock shall be declared inoperable.

2. During periods when containment integrity is required and an interlock is inoperable, each entry and exit via that airlock shall be locally supervised by a member of the unit operating maintenance or technical staffs, to assure that only one door is open at any time and that both doors are properly closed following use. A record of supervision and verification of closure shall be maintained during periods of interlock inoperability in an appropriate station log.

3. If an interlock is inoperable for more than 14 days following determination of inoperability, use of the airlock, except for emergency purposes, shall be suspended until the interlock is returned to operable status.

4.4.1.7 Operability of Purge Valves

1. A periodic pressurization of the purge valve interspaces to 50.6 psig per Specification 4.4.1.2.5.d shall be performed to help assure timely detection and resolution of valve and/or actuator degradation. The acceptance criteria is that total local leakage when updated for the new purge valve leakage shall be less than $0.6L_A$. See Specification 3.6.8 for further action.

2. The rubber seats on purge valves shall be visually examined and durometer tested each refueling interval to detect degradation (e.g. cracking, brittleness, etc.) and to assure timely cleaning, lubrication, and seat replacement.

More frequent testing of various penetrations is specified as these locations are more susceptible to leakage than the reactor building liner due to the mechanical closure involved. The basis for specifying a total leakage rate of 0.6 L_a from those penetrations and isolation valves is that more than one-half of the allowable integrated leakage rate will be from these sources.

Valve operability tests are specified to assure proper closure or opening of the reactor building isolation valves to provide for isolation or functioning of Engineered Safety Features systems. Valves will be stroked to the position required to fulfill their safety function unless it is establish that such testing is not practical during operation. Valves that cannot be full-stroke tested will be part-stroke tested during operation and full-stroke tested during each normal refueling shutdown.

Periodic surveillance of the airlock interlock systems is specified to assure continued operability and preclude instances where one or both doors are inadvertently left open. When an airlock is inoperable and containment integrity is required, local supervision of airlock operation is specified.

Purge valve interspace pressurization test operability requirements, inspections, and durometer testing provide a high degree of assurance of purge valve performance as containment barriers.

<u>References</u>

(1) UFSAR, Chapter 5.7.4 - "Post Operational Leakage Rate Tests"

(2) UFSAR, Tables 5.7-1 and 5.7-3

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 160 TO FACILITY OPERATING LICENSE NO. DPR-50

METROPOLITAN EDISON COMPANY
JERSEY CENTRAL POWER & LIGHT COMPANY
PENNSYLVANIA ELECTRIC COMPANY
GPU NUCLEAR CORPORATION

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-289

1.0 INTRODUCTION

By letter dated September 25, 1990, GPU Nuclear Corporation (the licensee) requested an amendment to the Technical Specifications (TS) for Three Mile Island Nuclear Station, Unit No. 1 (TMI-1). The proposed TS changes would delete the existing requirement to replace Reactor Building (RB) purge valve seats at the first refueling interval following 5 years service, and add the requirement to durometer test RB purge valve seats as part of the refueling surveillance.

The seats of the four 48" RB purge valves are made of molded ethylene propylene terpolymer (EPT) and form part of the containment isolation barrier. The purge valve seats were last replaced in February and March of 1985, and are currently scheduled for replacement during the 9R refueling outage scheduled to commence the third quarter of 1991. The proposed TS amendment was submitted to change the basis of purge valve seat replacement from calendar age to physical condition as monitored by surveillances associated with the purge valves.

2.0 BACKGROUND

The issue of excessive leakage of containment isolation valves with resilient seats was initially raised in IE Circular 77-11, dated September 6, 1977. Examination of valve seat material from valves which failed leakage tests under 10 CFR 50, Appendix J indicated that the material had lost resiliency and showed signs of wear due to valve cycling. The circular reported that licensees have taken actions such as seat replacement, testing seat materials for resiliency and increasing the frequency of local leak rate tests. The circular also recommended certain steps be taken to minimize the possibility of excessive valve leakage and to quickly detect leakage paths which develop. These steps included a comparison of material history and manufacturer's recommendations with testing frequency and maintenance schedules to determine if a schedule for valve seat replacement should be developed.

This issue evolved into Generic Issue (GI) B-20, "Containment Leakage due to Seal Deterioration." Resolution of this GI involved incorporating specific requirements for local leak rate testing into GI B-24, "Containment Purging during Normal Plant Operation." This requirement for increased local leak rate tests is based on guidance contained in Branch Technical Position CSB 6-4. The increased frequency of local leak rate tests provides assurance that gross deterioration of resilient valve seats would be quickly detected.

Technical Specifications proposed as part of GI B-24 included a surveillance requirement to periodically replace the resilient seals in containment purge valves for plants which continued to purge during plant operation. This requirement was incorporated into the TMI-1 TS. The basis for this requirement was expected wear to the valve seats due to repeated valve operation and a loss of resiliency due to exposure to an adverse environment. These proposed GI B-24 Technical Specifications did not include surveillance requirements to inspect the condition of the resilient valve seats at specific intervals. A requirement for periodic purge valve seat replacement is not included in the proposed revision to the Standard Technical Specifications. Generic Issue B-24 is now closed.

A reexamination of policy with regard to the operational usage of large purge system valves was conducted by the Office of Nuclear Reactor Regulation in 1990. This analysis concluded that the staff's current policy as presented in Standard Review Plan 6.2.4 and Branch Technical Position CSB 6-4 is adequate.

3.0 EVALUATION

The licensee has proposed adding the requirement to conduct a durometer test in addition to a visual inspection of purge valve seats as part of the refueling surveillance under TS 4.4.1.7.2. The durometer test will provide an indication of seat degradation by measuring the hardness of the seat material. The visual inspection provides timely detection of excessive seat wear.

The addition of a durometer test to the surveillance requirements provides added assurance that RB purge valve seat degradation will be detected and seat replacement will be performed in a timely manner. Based on this evaluation, the staff finds this proposed change to TS 4.4.1.7.2 acceptable. The bases were changed to reflect this additional testing requirement.

The licensee has proposed deleting the existing requirement to replace purge valve seats at the first refueling interval following 5 years of valve seat service. This requirement was added via License Amendment 108 dated May 8, 1985. The basis for this periodicity is the manufacturer's recommended shelf life for the seat of 5 years. The manufacturer has since revised this recommendation to allow installation after 5 years "provided the material is properly stored, durometer hardness checked, and visually inspected for ozone cracking prior to use." (Henry Pratt Company memorandum dated January 16, 1990; B.R. Cummins to P.E. Boucher).

The licensee has calculated a service life for the seat material based on thermal aging and integrated radiation dose. This computed service life is much greater than 5 years; however, the actual rate of degradation of the seat material will depend on the specific environment to which the material is exposed. Specifying periodicity for seat replacement does not necessarily assure the valve will perform its containment isolation function with a greater degree of certainty. All detected leakage which has developed past the currently installed seats has been corrected by minor adjustments of seat alignment, not seat replacement.

The requirements of 10 CFR Part 50 and guidance contained in U.S. Nuclear Regulatory Commission Regulatory Guides do not directly address a maximum service life for containment isolation valve seats. However, 10 CFR 50 Appendix J and Technical Position CSB 6-4 require periodic leak tests of the RB purge valves. This provides a direct indication of the ability of the valve seat to perform its design function. The required quarterly leak tests of the purge valves under TS 4.4.1.2 and the refueling surveillance under TS 4.4.1.7.2 were found to provide sufficient confidence in the integrity of the purge valves as containment isolation barriers. The deletion of the requirement to replace the purge valve seats at the first refueling interval following 5 years service from TS 4.4.1.7.2 is therefore acceptable.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted areas as defined in 10 CFR Part 20. 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. 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

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: S. Jones

Date: March 5, 1991