METROPOLITAN EDISON COMPANY

JERSEY CENTRAL POWER AND LIGHT COMPANY

AND

PENNSYLVANIA ELECTRIC COMPANY

THREE MILE ISLAND NUCLEAR STATION, UNIT 1

Operating License No. DPR-50
Docket No. 50-289
Technical Specification Change Request No. 234

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF DAUPHIN)

This Technical Specification Change Request is submitted in support of Licensee's request to change Appendix A to Operating License No. DPR-50 for Three Mile Island Nuclear Station, Unit 1. As part of this request. proposed replacement pages for Appendix A are also included.

GPU NUCLEAR CORPORATION

BY: J. J. Broughton
Vice President and Director, TMI-1

Sworn and subscribed before me this
30th day of November, 1993.

Melody Kim Kulp
Notary Public

Notarial Seal
Melody Kim Kulp, Notary Public
Londonderry Twp., Dauphin County
My Commission Expires Aug. 21, 1997
Member, Pennsylvania Association of Notaries

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF
GPU NUCLEAR CORPORATION

DOCKET NO. 50-289
LICENSE NO. DPR-50

CERTIFICATE OF SERVICE

This is to certify that a copy of Technical Specification Change Request No. 234 to Appendix A of the Operating License for Three Mile Island Nuclear Station Unit 1, has, on the date given below, been filed with executives of Londonderry Township, Dauphin County, Pennsylvania; Dauphin County, Pennsylvania; and the Pennsylvania Department of Environmental Resources, Bureau of Radiation Protection, by deposit in the United States mail, addressed as follows:

Mr. Daryl LeHew, Chairman
Board Supervisors of
Londonderry Township
R. D. #1, Geyers Church Road
Middletown, PA 17057

Mr. Russel L. Sheaffer, Chairman
Board of County Commissioners
of Dauphin County
Dauphin County Courthouse
Harrisburg, PA 17120

Director, Bureau of Radiation Protection
Attn: Mr. Richard Janati
Pa Dept. of Environmental Resources
P. O. Box 2063
Harrisburg, PA 17120

GPU NUCLEAR CORPORATION

BY: _____
Vice President and Director, TMI-1

DATE: November 30, 1993

GPU Nuclear

GPU Nuclear Corporation
Post Office Box 480
Route 441 South
Middletown, Pennsylvania 17057-0191
717 944-7621
TELEX 84-2386
Writer's Direct Dial Number:
(717) 948-8005

November 30, 1993
C311-93-2141

Director, Bureau of Radiation Protection
PA Dept. of Environmental Resources
P. O. Box 2063
Harrisburg, PA 17120
Attn: Mr. Richard R. Janati

Dear Mr. Janati:

Enclosed please find one copy of Technical Specification Change Request No. 234 to the Operating License for Three Mile Island Nuclear Station, Unit 1.

This document was filed with the U. S. Nuclear Regulatory Commission on the above date.

Sincerely,

T. G. Broughton
Vice President and Director, TMI-1

DJD/amk

Enclosure

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November 30, 1993
C311-93-2141

Mr. Russell L. Sheaffer, Chairman
Board of County Commissioners of
Dauphin County
P. O. Box 1295
Harrisburg, PA 17120

Dear Mr. Sheaffer:

Enclosed please find one copy of Technical Specification Change Request No. 234 to the Operating License for Three Mile Island Nuclear Station, Unit 1.

This request was filed with the U. S. Nuclear Regulatory Commission on the above date.

Sincerely,

T. G. Broughton
Vice President and Director, TMI-1

DJD/amk

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November 30, 1993
C311-93-2141

Mr. Daryl LeHew, Chairman
Board of Supervisors of
Londonderry Township
R. D. #1, Geyers Church Road
Middletown, PA 17057

Dear Mr. LeHew:

Enclosed please find one copy of Technical Specification Change Request No. 234 to the Operating License for Three Mile Island Nuclear Station, Unit 1.

This request was filed with the U. S. Nuclear Regulatory Commission on the above date.

Sincerely,

T. G. Broughton
Vice President and Director, TMI-1

DJD/amc

Enclosure

ENCLOSURE

I. TECHNICAL SPECIFICATION CHANGE REQUEST NO. 234

GPUN requests that the following changed replacement pages be inserted into the existing Technical Specifications:

Revised Pages: vii, 2-1, 2-2, 2-3, 2-4b, 2-4c, 2-5, 2-6, 2-7, 2-10, 2-12
Revised Table: 2.3-1
Revised Figure: 2.1-3
Remove Figures: 2.1-2, 2.3-2

These pages are attached to this change request.

II. REASON FOR CHANGE

This change is requested to modify the TMI-1 Technical Specifications to remove the Axial Power Imbalance Protective Limits (Technical Specification Section 2.1 and Figure 2.1-2), Protection System Maximum Allowable Setpoints for Axial Power Imbalance (Technical Specification Section 2.3, Figure 2.3-1, and Table 2.3-1), Design Nuclear Power Peaking Factors and Maximum Allowable Local Linear Heat Rate Limit (Technical Specification Section 2.1 Bases), and incorporate these limits and setpoints in the TMI-1 Core Operating Limits Report (COLR). Removal of these protective and maximum allowable setpoint limits to the COLR is consistent with NRC approved BWFC Topical Report BAW-10179P-A, currently referenced in TMI-1 Technical Specification Section 6.9.5.2.

III. SAFETY EVALUATION JUSTIFYING CHANGES

List of Figures

Technical Specification Page vii, List of Figures, is revised to indicate deletion of Figures 2.1-2 and 2.3-2. This is an administrative change to the Table of Contents.

Technical Specification Section 2.1

Technical Specification Section 2.1.2

Technical Specification Section 2.1.2 is revised to change "safety limit" to "protective limit" consistent with BAW-10179P-A and Babcock and Wilcox Owner's Group (BWOG) Revised Standard Technical Specification wording. This is an administrative change.

Axial Power Imbalance Protective Limits

Technical Specification Section 2.1.2 and 2.1 Bases are revised to reference the axial power imbalance protective limits in the COLR in lieu of reference to Figure 2.1-2. Figure 2.1-2 is removed and incorporated into the TMI-1 COLR.

The axial power imbalance protective limits are based on the core power distribution analysis and are established to ensure sufficient margin to the specified acceptable fuel design limits to prevent centerline fuel melt and minimum DNBR criteria from being exceeded.

Based on calculated 3-dimensional core power distributions, cycle-specific correlations are developed between power peaking (or maximum linear heat generation rate) and axial power offset (ratio of imbalance to fractional thermal power) using the following NRC-approved methodologies described in BAW-10179P-A, including:

1. BAW-10180A, Rev. 1, "NEMO - Nodal Expansion Method Optimized," March 1993
2. BAW-10122A, Rev. 1, "Normal Operating Controls, "May 1984

Allowable peaking limits to prevent centerline fuel melt and DNB are established also using the following applicable NRC-approved methodologies described in BAW-10179P-A, including:

1. BAW-10141P-A, "TACO-2: Fuel Performance Analysis," June 1983
2. BAW-10162P-A, "TACO-3 Fuel Pin Thermal Analysis Computer Code," November 1989
3. BAW-10184P-A, "GDTACO: Urania-Gadolinia Thermal Analysis Code," May 1992
4. BAW-10156-A, "LYNXT: Core Transient Thermal-Hydraulic Program," February 1986
5. BAW-10143P-A, "B&W Correlation of Critical Heat Flux," April 1985

The centerline fuel melt allowable peaking limits are established using bounding rod power histories in the TACO series fuel performance codes to establish linear heat rate-to-melt capability for the fuel design. The DNBR-based allowable peaking limits are called Maximum Allowable Peaking (MAP) limits and are described in BAW-10179P-A. Peaking margins are then calculated for analyzed core power distributions as the difference between the allowable peaking limit and the local augmented peak. The axial power imbalance protective limit curves are then established to ensure appropriate margins are maintained for all conditions. The axial power imbalance protective limit methods are extended to the design overpower condition (112% FP) established by previous safety analyses to ensure that the local linear heat rate will not exceed the centerline fuel melt criterion.

The flow-dependent portion of this protection limit is derived for zero imbalance and design peaking conditions, and is known as the power-to-flow or flux-to-flow limit. The limit is established to protect the core when flow reductions occur and ensures that the MDNBR criteria will not be violated for the limiting loss-of-coolant flow pump coastdown transient. The limit also acts as a high flux trip for partial pump operation (3-pump or 2-pump).

These methodologies are described in BAW-10179P-A and identified in the TMI-1 COLR. BAW-10179P-A was approved by NRC in a Safety Evaluation Report (SER) dated March 16, 1993, including allowance of removal of the axial power imbalance protective limit curves from the TS to the COLR. The title of the Figure 2.1-2 curves incorporated into the COLR is changed from "Core Protection Safety Limits" to "Axial Power Imbalance Protective Limits" for consistency with the distinction between protective limits and safety limits established in BAW-10179P-A.

Technical Specification Section 2.1 Bases are also clarified to indicate that the maximum thermal power for each reactor coolant pump operating condition (four pump, three pump, and one pump in each loop) listed on Figure 2.1-3 are now given in the COLR. Also, the basis for establishing these power levels using the minimum flow and the flux/flow ratio is clarified as applying to all pump conditions, and specific parameter values are omitted consistent with removal of the limits to the COLR. This is an administrative change to the Technical Specification Bases.

Nuclear Power Peaking Factor

Technical Specification Section 2.1 Basis is also revised to remove the design nuclear power peaking factors and provide reference to the COLR. The design nuclear power peaking factors define the reference design peaking condition in the core for operation at the maximum overpower. These peaking limits serve as the basis for the pressure/temperature core protection safety limit, the power-to-flow limit and the updated Final Safety Analysis Report Safety analyses that prevent cladding failure due to DNB overheating during steady-state and transient operation. These peaking factors include the nuclear enthalpy rise hot channel factor ($F^N_{\Delta H}$, also known as the radial-local peaking factor), the axial flux shape peaking factor (F^N_z), and the total nuclear power peaking factor ($F^N_q = F^N_{\Delta H} \times F^N_z$). Although used to establish the core reference design peaking condition, the radial-local is sensitive to specific core design conditions. Similarly, the axial flux shape factor may be changed to justify specific core design conditions.

The methodology for the application of the nuclear power peaking factors to establish the DNB-related core limits is described in BAW-10179P-A. Removal of $F^N_{\Delta H}$ from the Technical Specifications to the COLR was approved by NRC in the SER dated March 16, 1993. As part of the same approved methodology, and for consistency, it is justifiable to remove F^N_z and F^N_q along with $F^N_{\Delta H}$ since all protect the DNBR criteria. It is also noted that the design nuclear power peaking factors are in Technical Specification Bases and are not specification limits.

Maximum Allowable Local Linear Heat Rate

Technical Specification 2.1 Basis is also revised to remove the maximum allowable local linear heat rate limit to the COLR. This limit is the basis for the imbalance portions of the axial power imbalance protective limits and setpoints. The limit is established for each fuel design.

The methodology for determining the maximum allowable local linear heat rate is described in BAW-10179P-A and approved by NRC in the SER dated March 16, 1993. Although not specifically listed in the NRC SER as a cycle dependent Technical Specification parameter, this linear heat rate limit is integral to the axial power imbalance protective limit curves that have been specifically allowed for removal. Also, the limit to ensure thermal margin to protect the centerline fuel melt criteria is similar to the radial-local peaking factor ($F^N_{\Delta H}$) which protects the DNBR criteria and is allowed to be moved to the COLR. It is also noted that the maximum allowable local linear heat rate is currently in Technical Specification Bases and is not a specification limit.

Technical Specification Section 2.3

Protection System Maximum Allowable Setpoints for Axial Power Imbalance

Technical Specification Section 2.3.1 and Basis Section are revised to reference the protection system maximum allowable setpoints for axial power imbalance in the COLR, in lieu of reference to Figure 2.3-2. Figure 2.3-2 is removed and is incorporated into the TMI-1 COLR. Table 2.3-1 and Section 2.3 Basis are revised to reference the reactor protection system trip setting limits for nuclear power based on flow and imbalance in the COLR for all reactor coolant pump operating conditions. These setpoints curves, known as the power/imbalance/flow trip, provide steady-state protection for the axial power imbalance protective limits described above and therefore provide additional protection for the centerline fuel melt and MDNBR criteria.

The flux/flow setpoint is derived by adjusting the power-to-flow limit for mea rement uncertainties, thereby providing additional assurance that the MD , criteria will not be violated.

power-imbalance setpoint envelope is derived by error-adjustment of the cycle-specific axial power imbalance limits for flux and imbalance measurement uncertainties and reactor protection system equipment detectability limitations. The axial power imbalance limits restrict peaking changes from the steady state operating conditions so that DNBR and centerline fuel melt criteria are not exceeded. The combination of the two error-adjusted setpoints provides the power/imbalance/flow trip setpoint envelope.

This setpoint methodology is described in BAW-10179P-A and identified in the TMI-1 COLR. BAW-10179P-A was approved by NRC in SER dated March 16, 1993, including allowance to remove the power/imbalance/flow trip setpoint envelope from the Technical Specifications to the COLR.

Technical Specification Figure 2.1-3 is administratively changed to be consistent with the removal to the COLR of the power-to-flow limit and setpoint.

The specific values of the limits in the TMI-1 COLR will be modified through the 10 CFR 50.59 process when such values are developed using NRC-approved methodologies consistent with all applicable limits of the safety analyses addressed in the TMI-1 FSAR. As currently required by Technical Specification Section 6.9.5.4, any revisions to the Core Operating Limits Report will be provided to NRC upon issuance for trending information.

IV. NO SIGNIFICANT HAZARDS CONSIDERATIONS

GPUN has determined that the Technical Specification Change Request poses no significant hazards as defined by NRC in 10 CFR 50.92.

1. Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated. The proposed amendment relocates protective and maximum allowable setpoint limits from Technical Specifications, and design nuclear power peaking factors and the maximum allowable local linear heat rate limit from Technical Specification Bases, to the TMI-1 Core Operating Limits Report in accordance with NRC-approved Topical Report BAW-10179P-A. The proposed amendment provides continued

control of the values of these limits and assures these values remain consistent with all applicable limits of the safety analyses addressed in the TMI-1 FSAR. The Technical Specifications retain the requirement to maintain the plant within the appropriate bounds of these limits. Therefore, the proposed amendment has no effect on the probability of occurrence or consequences of an accident previously evaluated.

2. Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed amendment relocates protective and maximum allowable setpoint limits, design nuclear power peaking factors and maximum allowable local linear heat rate limit to the TMI-1 Core Operating Limits Report. The Technical Specifications retain the requirement to maintain the plant within the appropriate bounds of these limits. Therefore, the proposed amendment has no effect on the possibility of creating a new or different kind of accident from any accident previously evaluated.

3. Operation of the facility in accordance with the proposed amendment would not involve a significant reduction in a margin of safety. The proposed amendment provides continued control of the values of these limits and assures these values remain consistent with all applicable limits of the safety analyses addressed in the TMI-1 FSAR. Therefore, it is concluded that operation of the facility in accordance with the proposed amendment does not involve a significant reduction in a margin of safety.

V. IMPLEMENTATION

It is requested that the amendment authorizing this change become effective upon issuance.