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. 251

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 S Broughton
Vice President and Director, TMI

Sworn and subscribed before me this

1st day of June, 1995.

Erin M. Flowers
Notary Public

Notarial Seal
Erin M. Flowers, Notary Public
Londonderry Twp., Dauphin County
My Commission Expires Sept. 11, 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. 251 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. Jay Kopp, Chairman
Board Supervisors of
Londonderry Township
R.D. #1, Geyers Church Road
Middletown, PA 17057

Mr. Russell L. Sheaffer, Chairman
Board of County Commissioners
of Dauphin County
P.O. Box 1295
Harrisburg, PA 17108

Director, Bureau of Radiation Protection
PA Department of Environmental Resources
P.O. Box 2063
Harrisburg, PA 17120
ATTN: Mr. Robert Barkanic

GPU NUCLEAR CORPORATION

BY: F G Broughton
Vice President and Director, TMI

DATE: June 1, 1995

ATTACHMENT I

I. TECHNICAL SPECIFICATION CHANGE REQUEST (TSCR) NO. 251

GPU Nuclear requests that the following changed replacement page be inserted into the existing Technical Specification:

Revised page: 5-4

This page is attached to this change request.

II. REASONS FOR CHANGE

The test assemblies will be irradiated for the three (3) fuel cycles, to demonstrate the corrosion performance of the zirconium-based advanced cladding material.

This change is requested to allow use of two advanced zirconium alloy fuel rod cladding materials in TMI-1 Cycle 11 and subsequent cycles. TMI-1 Technical Specification Section 5.3.1.1 currently specifies that fuel rods be clad with Zircaloy or ZIRLO. The advanced fuel rod cladding materials being considered are designated M4 and M5 and have compositions outside the Zircaloy or ZIRLO specifications. These claddings will be initially irradiated in peripheral rod locations in two (2) Mark B10 fuel assemblies. Each of the two (2) assemblies will contain eight (8) advanced cladding fuel rods (four M4 and four M5).

III. SAFETY EVALUATION JUSTIFYING CHANGE

The advanced cladding materials being considered are M4 and M5 type cladding. These materials are being irradiated in the reactor core at McGuire Unit 1 and have been used in European reactors. Post-irradiation examination results after the first and second cycles at McGuire-1 indicate the materials are performing well. The licensing basis for the McGuire demonstration assemblies is documented in the attached B&W Fuel Company Topical Report BAW-2133P. The M4 alloy is identical to the F3 alloy that was evaluated in BAW-2133P. The M5 alloy is identical in chemical composition to the F4 alloy described in BAW-2133P, but was subjected to a slightly different temperature in the final anneal process. This slight temperature difference produces a more uniform homogeneous microstructure which further enhances the corrosion properties of the material. The advanced clad materials will be irradiated at TMI-1 for three (3) cycles, beginning with the upcoming Cycle 11 reload (September 1995). This demonstration program is being conducted to determine how various clad materials react under in-reactor conditions to support improved fuel assembly performance at higher fuel burnups and residence times. Each of the rods to be tested is expected to perform at least as well as the current fuel design.

The non-Zircaloy-4 clad types to be utilized in the TMI-1 Cycle 11 core have been tested for corrosion resistance, tensile and burst strength, and creep characteristics. Details concerning the test programs that have been performed in support of this demonstration are described in BAW-2133P.

The safety significance of this change is considered minimal. The number of fuel rods involved is very small in comparison to the total core inventory. Failure of all the advanced cladding fuel rods from a cause related to the demonstration would constitute significantly less than 1% fuel failure postulated in FSAR Chapter 14 safety analyses. Failure of the fuel as a result of some unrelated phenomenon would not result in greater inventory release than non-demonstration fuel.

Attachment V provides nuclear, mechanical, thermal and LOCA evaluations that demonstrate the acceptability of the advanced cladding fuel rods in TMI-1 Cycles 11, 12, and 13. The fuel rods are shown to meet all established design criteria and will operate safely during those cycles.

The demonstration assemblies meet the same design bases as the fuel which is currently in the reactor. No safety limits have been changed or setpoints altered as a result of the use of these assemblies. The FSAR analyses are bounding for the demonstration assemblies as well as the remainder of the core.

The demonstration assemblies will be placed in core locations which will allow them to accumulate approximately 45 to 50 GWD/MTU during three (3) cycles of exposure. Based on current cycle design projections the advanced cladding rods will reach burnups up to 53 GWD/MTU. The assemblies will be placed in core locations which will not experience limiting power peaking in any cycle.

Following each cycle, the demonstration assemblies will undergo a post-irradiation examination (PIE) to gauge performance. The examinations will include visual inspections to monitor fuel performance. Direct physical measurements may be taken as needed.

It is concluded that TMI-1 can operate safely with the demonstration program in place. The advanced zirconium-based alloys have been shown through testing to perform satisfactorily under conditions representative of a reactor environment. In addition, the relatively small number of fuel rods involved does not represent a large inventory of radioactive material which could be released into the reactor coolant in the event of fuel failure.

IV. NO SIGNIFICANT HAZARDS CONSIDERATION

GPU Nuclear has determined that this Technical Specification Change Request involves no significant hazards consideration 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 the consequences of an accident previously evaluated. The test assemblies with the

zirconium-based claddings are mechanically and thermal-hydraulically similar to the remainder of the reload batch and the rest of the core, so no failure probability is increased, nor is any operational practice changed which could introduce a new initiator of an accident. The only credible event which could occur as a result of this demonstration is clad failure of the test fuel rods. The number of fuel rods involved is such a small percentage of the core inventory that even a postulated failure of all the demonstration fuel rods from a cause related to the demonstration would not result in dose consequences greater than existing limits. A failure of the fuel rods from a cause not related to the demonstration would not result in consequences greater than those which would have occurred had the assemblies not been demonstrated assemblies. Therefore, this change does not increase the probability of occurrence or the 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 mechanical and thermal-hydraulic similarity of the test assemblies to the remainder of assemblies in the core precludes the credible possibility of creating any new failure mode or accident sequence. The use of the demonstration assemblies does not involve any alterations to plant equipment or procedures which would introduce any new or unique operational modes or accident precursors.

3. Operation of the facility in accordance with the proposed amendment would not involve a significant reduction in a margin of safety. The demonstration assemblies meet the same design as the remainder of assemblies in the core. Existing reload design and safety analysis limits are maintained, and the FSAR analyses are bounding. No special setpoints or other safety settings are required as a result of the use of these two (2) test assemblies. The assemblies will be placed in locations which will not experience limiting peak power conditions. Therefore, it is concluded that operation of the facility in accordance with the proposed amendment does not involve a reduction in a margin of safety.

V. IMPLEMENTATION

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