Nocket No. 50-320

Mr. F. R. Standerfer Vice President/Director, TMI-2 GPU Nuclear Corporation P. O. Rox 480 Middletown, PA 17057

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Dear Mr. Standerfer:

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 2 - LOWER CORE SUPPORT ASSEMBLY DEFUELING (TAC 64632)

The Nuclear Regulatory Commission Staff has reviewed your January 19, 1988 and subsequent submittals pertaining to the defueling of the Lower Core Support Assembly. As stated in the enclosed Safety Evaluation issued by the staff, we conclude that the proposed activity can be accomplished without significant risk to the health and safety of the public provided that they are in accordance with the limitations stated in the staff's Safety Evaluation which are consistent with your submittals. Removal of any gusseted incore guide tube or portions of the elliptical flow distributor is not within the scope of the staff's Safety Evaluation. Defueling of the lower core support assembly falls within the scope of activities previously considered in the Programmatic Environmental Impact Statemert.

We therefore approve the defueling of the lower core support assembly described in your Safety Evaluation Report contingent upon the submittal of the related procedures subject to Technical Specification 6.8.2.

Sincerely,

JOINT F. STORE JOIN F. STORE Iohn F. Stolz, Director Project Directorate I-4 Division of Reactor Project I/II

Enclosure As stated cc w/enclosure See next page cc: T. F. Denmitt R. E. Rogan W. E. Potts S. Levin J. J. Byrne A. W. Miller Service Distribution List (See attached)

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cc:

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Regional Admininstrator, Region I U.S. Kuclear Regulatory Commission 475 Allendale Road King of Prussia, Pennsylvania 19406

Dr. Oscar H. Paris Administrative Judge Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, D.C. 20555

Karin K. Carter Assistant Attorney General 505 Executive House Post Office Eox 2357 Harisburg, Pennsylvania 17120

George F. Trowbridge, Esq. Shaw, Pittman, Potts and Trowbridge 1800 M Street, NW Washington, D.C. 20036

Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, D.C. 20555

Atomic Safety and Licensing Appeal Panel U.S. Nuclear Regulatory Commission Washington, D.C. 20555

Secretary U.S. Nuclear Regulatory Commission ATTN: Chief, Docketing & Service Branch Washington, D.C. 20555

Mr. Larry Hochendoner Dauphin County Commissioner Post Office Box 1295 Harrisburg, Pennsylvania 17108-1295

John E. Minnich, Chairperson, Dauphin County Board of Commissioners Dauphin County Courthouse Front and Market Streets Harrisburg, Pennsylvania 17101 Three Mile Island Nuclear Station Unit No. 2

John F. Wolfe, Esq., Chairman Administrative Judge 3409 Shepherd Street Chevy Chase, Maryland 20015

Dr. Frederick H. Shon Administrative Judge Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, D.C. 20555

Dr. Judith H. Johnsrud Environmental Coalition on Nuclear Power 433 Orlando Avenue State College, Pennsylvania 16801

Dauphin County Office of Emergency Preparedness Court House, Room 7 Front and Market Streets Harrisburg, Pennsylvania 17101

U.S. Environmental Protection Agency Region III Office ATTN: EIS Coordinator Curtis Building (Sixth Floor) 6th and Walnut Streets Philadelphia, Pennsylvania 19106

Thomas M. Gerusky, Director Bureau of Radiation Protection Department of Environmental Resources Post Office Box 2063 Harrisburg, Pennsylvania 17120

Dan Kennedy Office of Environmental Planning Department of Environmental Resources Post Office Box 2063 Harrisburg, Pennsylvania 17120

Willis Bixby, Site Manager U.S. Department of Energy Post Office Box 88 Middletown, Pennsylvania 17057-0311



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

LOWER CORE SUPPORT ASSEMBLY DEFUELING

GPU NUCLEAR CORPORATION

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 2

DOCKET NO. 50-320

INTRODUCTION

The Lower Core Support Assembly Defueling (SER), (reference 1) submitted for NRC review and approval describes the dismantling and defueling of the lower core support assembly (LCSA) and partial defueling of the lower head. The use of the core bore machine, plasma arc cutting equipment, cavitating water jet, robot manipulators, the automatic cutting equipment system and other previously approved tools and equipment are included in this Safety Evaluation. The staff's review also considered the additional information supplied in references (2), (3), and (6) and also the response to questions found in reference (4).

EVALUATION

The staff has evaluated your analysis of the consequences of the unlikely but potential event of a complete failure of an incore instrument penetration. Any fuel leakage into the cavity below the reactor vessel will be bounded by the 40,000 lbs. used in your analysis. The staff finds that maintaining 2950 ppm boron in the water cavity provides an adequate level of protection against potential criticality. Initial boration of the water to 3500 ppm in the cavity below the reactor vessel and periodic sampling and analysis provides assurance that a minimum concentration of 2950 ppm will be maintained.

The following limitations, consistent with your submittals, will apply to this activity.

- Nitrogen, N₂, shall be used as both primary and secondary plasma torch gases.
- Effluent from the defueling work platform off gas system shall be routed to the vicinity of the containment purge system suction point similar to that described in reference (5).
- The defueling work platform off gas system and containment purge system must be operating whenever plasma arc cutting is performed.
- 4) Prior to removal of the lower grid forging the boron concentration within the cavity beneath the reactor vessel shall be increased to at least 3500 ppm and maintained at a minimum concentration of 2950 ppm as specified in Section 4.13, Reactor Building Basement, of your proposal, reference (1). If the boron concentration falls below 2950 ppm suspend all activities that result in core alterations.

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 Neutron monitoring instrumentation shall be maintained as per Section 3.3.1, Neutron Monitoring Instrumentation, of the Technical Specifications.

The potential for criticality due to cooling water leakage during plasma arc cutting was examined by the NFC staff (reference 7). The following additional restrictions will apply while the plasma arc cutting equipment is installed in the reactor vessel.

- There shall be independent verification that the 15 gallon flush water tank is disconnected from the HE-200 system when filling the 15 gallon tank.
- 2) There shall be independent verification that the 15 gallon flush water tank has been disconnected from the HE-2CC unit prior to moving the torch within one foot of fuel bearing areas (small isolated areas containing less than 22 lbs (10kg) of fuel are excepted from the one foot exclusion).
- 3) The secondary purge gas flow shall be on when the 15 gallon flush tank is connected to the HE-200 unit.

Removal of any gusseted incore guide tubes and the elliptical flow distributor are not included in the scope of this Safety Evaluation. These two structures form part of the protection for heavy load drops inside and over the reactor vessel during LCSA defueling.

CONCLUSIONS

The staff has reviewed the proposed activities associated with the defueling of the lower core support assembly.

The staff concludes that the proposed activities can be accomplished without significant risk to the health and safety of the public provided that they are in accordance with the limitations stated in your submittals and the limitations in this SER. This activity falls within the scope of activities previously considered in the Programmatic Environmental Impact Statement.

Principal Contribution: Ronald J. Cook

Dated: April 1, 1988

REFERENCES

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- GFUN letter, 4410-88-L-0005/0067P, F. R. Standerfer to NFC Document Control Desk, Lower Core Support Assembly Defueling, dated January 19, 1988.
- GPUN letter, 4410-87-L-0138/0067P, F. R. Standerfer to NFC Document Control Desk, Core Support Assembly and Lower Head Defueling, dated November 30, 1987.
- GPUN letter, 4410-87-L-0139/0221P, F. R. Standerfer to NFC Document Control Besk, Criticality Safety Assessment for Use of the Plasma Arc Torch to Cut the Lower Core Support Assembly, dated November 30, 1987.
- GPUN letter, 4410-88-L-0026/0358P, F. R. Standerfer to NRC Document Control Desk, Criticality Safety Assessment for Use of the Plasma Arc Torch to Cut the Lower Core Support Assembly, dated February 26, 1988.
- GFUN Engineering Change Authorization No. 3261-87-0488, Rev. 0, dated July 13, 1987.
- GPUN letter, 4410-88-L-0044/0365P, F. R. Standerfer to NFC Document Control Desk, Criticality Safety Assessment for Use of the Plasma Arc Torch, dated March 16, 1988.
- NRC Memorandum L. H. Thonus to J. F. Stolz and W. D. Travers Review of Criticality Potential from Plasma Arc Torch at TMI-2, dated March 17, 1988.

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