April 4, 1989

Docket No. 50-320

Mr. M. B. Roche Vice President/Director, TMI-2 GPU Nuclear Corporation P. O. Box 480 Middletown, Pennsylvania 17057

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BGrimes ACRS(10)

Dear Mr. Roche:

Subject: THREE MILE ISLAND NUCLEAR STATION, UNIT 2 - SAFETY EVALUATION REPORT FOR THE COMPLETION OF UPPER CORE SUPPORT ASSEMBLY DEFUELING (TAC 69409)

The Nuclear Regulatory Commission staff has reviewed your Safety Evaluation Report (SER) for the Completion of Upper Core Support Assembly (UCSA) Defueling dated September 15, 1988. As stated in the enclosed Safety Evaluation, we conclude 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 in the Safety Evaluation.

Removal of upper core support assembly components and the fuel behind the core baffle plates falls within the scope of activities previously considered in the Programmatic Environmental Impact Statement (NUREG 0683, as supplemented). We, therefore, approve the cutting and removal of baffle plates and the removal of fuel in the UCSA as described in your SER.

Sincerely.

Signed by P. Tam for

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

Enclosure: As stated

cc w/enclosure: See next page

DFOI

[TAC 69409]

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*See previous concurrence sheet

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Mr. M. B. Roche GPU Nuclear Corporation

cc:

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UNITED STATES NUCLEAR REGULATORY COMMISSION

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

COMPLETION OF UPPER CORE SUPPORT ASSEMBLY DEFUELING

GPU NUCLEAR CORPORATON

THREE MILE ISLAND NUCLEAR STATION UNIT NO. 2

DOCKET NO. 50-320

INTRODUCTION

GPU Nuclear Corporation (GPUN, the licensee) submitted for NRC review and approval a Safety Evaluation Report (SER) for the defueling of the Upper Core Support Assembly (UCSA) in reference 1. The NRC staff had previously reviewed and approved SERs for early defueling, bulk defueling of the core region, defueling of the lower core support assembly (LCSA), and lower head (LH) (references 2, 3, 4, and 5). The principal consideration in the current SER is the potential for dropping portions of the core baffle plates or tools on the exposed portion of the LH. The staff evaluated the licensee's load handling program and the potential consequences of the load drops.

EVALUATION

The defueling of the damaged Three Mile Island Unit 2 (TMI-2) reactor vessel has been proceeding since October, 1985. To date over 75% of the fuel and core debris has been removed. In prior safety evaluations there has been uncertainty regarding the location and configuration of the core materials. Conservative assumptions were made regarding geometry, enrichment, location, and particle size distribution by both GPUN and the NRC staff.

At the present time the remaining fuel is well characterized, including its location. Criticality controls and boron dilution controls remain as imposed in previous SERs. The known safety margin to criticality has increased due to defueling progress and the knowledge that the fuel is in a significantly less than optimal geometry. Similarly the portion of the core debris which had the greatest potential to contain pyrophoric materials has been removed while the safety controls remain.

At the time of upper core support assembly (UCSA) defueling, a central portion of the elliptical flow distributor will likely have been cut and removed. This will expose the LH and incore instrument penetrations (IIP) to dropped loads. During UCSA defueling the potential exists for a load drop involving sections

8904120344 890404 PDR ADOCK 05000320 P PDC of the the core baffle plates or defueling tools. The NRC staff has previously reviewed the licensee's heavy load handling program and found it acceptable in reference 6. This program includes:

- 1. definition of safe load paths
- 2. development of load handling procedures
- 3. periodic inspection and testing of cranes
- 4. qualifications, training and specified conduct of operators
- 5. special lifting devices satisfy the guidelines of American National Standards Institute (ANSI) N14.6-1978
- 6. lifting devices that are not for designed specific applications installed and used in accordance with the guidelines of ANSI B30.9
- 7. design of cranes to ANSI B30.2 or Crane Manufacturers Association of America (CMAA) 70.

The licensee and the NRC staff have also evaluated the consequences of potential load drop accidents during UCSA defueling. In general they fall within the bounds analyzed in references 5 and 7. The forces generated are not large enough to force an IIP thru the LH or to directly breach the lower head. The potentially ablated area outward of the mid-line of the "P" row of fuel assemblies will remain protected by the elliptical flow distributor unless prior examination shows this area to be undamaged.

CONCLUSIONS

The staff has reviewed and evaluated the proposed UCSA defueling. 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 safety evaluation. This activity falls within the scope of activities previously considered in the Programmatic Environmental Impact Statement (NUPEG 0683, as Supplemented).

REFERENCES

- GPUN letter, 4410-88-L-0138/0394P, F. R. Standerfer to NRC Document Control Desk, Safety Evaluation Report for the Completion of Upper Support Core Assembly Defueling, dated September 15, 1988
- NRC letter, W. D. Travers to F. R. Standerfer, GPUN, Commencement of Three Mile Island Unit 2 Preliminary Defueling Operations, dated October 29, 1985.
- NRC letter, W. D. Travers to F. R. Standerfer, GPUN, Commencement of Bulk Defueling Activities, dated July 24, 1986.

- NRC letter, J. F. Stolz to F. R. Standerfer, GPUN, Three Mile Island Nuclear Station, Unit No. 2, Lower Core Support Assembly Defueling (TAC 64632), dated April 1, 1988.
- NRC letter, J. F. Stolz to M. B. Roche, GPUN, Three Mile Island Nuclear Station, Unit 2 - Lower Core Support and Lower Head Defueling (TAC:67857), dated December 1, 1988.
- NRC letter, W. D. Travers to F. R. Standerfer, GPUN, Heavy Load Handling Inside Containment, Revision 2, dated November 15, 1985.
- GPUN letter, 4410-89-L-0005/0067P, F. R. Standerfer to NRC Document Control Desk, Safety Evaluation Report for Lower Core Support Assembly Defueling, dated January 18, 1989.

Principal Contributor: Lee H. Thonus

Dated: April 4, 1989

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