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MAY 17 1982

Docket No. 50-320

Mr. John J. Barton
Acting Director of TMI-2
GPU Nuclear Corporation
P.O. Box 480
Middletown, PA 17057

Dear Mr. Barton:

The Nuclear Regulatory Commission has issued the enclosed Amendment of Order for the Three Mile Island Nuclear Station, Unit 2. This Amendment of Order changes the Recovery Mode Proposed Technical Specifications to allow for operations necessary to prepare for future recovery mode activities. The changed requirements had been imposed by the Order of the Director of the Office of Nuclear Reactor Regulation on February 11, 1980. These changes are being made in response to your request of April 8, 1982. This Amendment of Order is effective upon issuance.

Copies of the related Safety Evaluation and revised pages for the proposed Technical Specifications and their associated bases are enclosed.

Sincerely,

Bernard J. Snyder, Program Director
TMI Program Office
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment of Order
- 2. Safety Evaluation
- 3. Proposed Technical Specification Page Changes

cc w/encl: See next page
L. King
J. Larson

*Changes noted & incorporated
paragraph added (pg 4)
JTB 5/10/82*

*concur subject
to the changes
noted*

RAW

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OFFICE	TMIP0:NRR	TMIP0:HRR	TMIP0:NRR	ELD	NRR	HRR
SURNAME	TPointexter	bg Rweller	BJsnyder	M W Jones	EGCase	HRDenton
DATE	4/27/82	4/29/82	5/10/82	5/3/82	4/10/82	5/1/82

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

Although these requirements were imposed on the licensee by an Order of the Director of Nuclear Reactor Regulation, dated February 11, 1980, the TMI-2 license has not been formally amended. The requirements are reflected in the proposed Recovery Mode Technical Specifications presently pending before the Atomic Safety and Licensing Board. Hereafter in this Amendment of Order, the requirements in question are identified by the applicable proposed Technical Specification.

II.

By letter dated April 8, 1982, the licensee requested changes to the Proposed Technical Specifications, Appendix A for Three Mile Island, Unit 2 (TMI-2). The licensee has requested NRC staff approval to allow the movement of an individual control rod (CR) or axial ~~power~~ shaping rod (APSR) for the purpose of gathering additional information on the condition of the core and to prepare the reactor vessel for head removal. The staff agrees with the licensee that by moving an individual control rod or axial power shaping rod, more information on the core condition may be obtained. Also, prior to head removal, it will be necessary to decouple the APSR lead screws. This can most easily be accomplished if the rods are first fully inserted. Therefore inserting the APSR's at this time on an individual basis is a step that must be performed sometime during the cleanup. The licensee has requested to do this step now and the staff concurs. Presently section 3.1.3.1 of the Proposed Technical Specifications does not allow any movement and requires that all control rod drive breakers be open. The staff has analyzed what the shutdown margin of the TMI-2 core would be assuming that there is no control material or poison in the core and concluded that by maintaining a

3000 ppm boron concentration, there is enough conservatism to assure that K_{eff} will be less than 0.944. Further analysis has shown that with a boron concentration of 3500 ppm, the core will remain subcritical with $K_{eff} < 0.90$ in any physically reasonable rearrangement of the fuel, even in the absence of all control material and burnable poisons. Even though proposed Technical Specification 3.1.1.2 requires a minimum boron concentration of 3,000 ppm, the licensee has shown by sampling that the reactor coolant system has been consistently maintained at approximately 3800 ppm boron. Therefore it is the staff's opinion that by moving a control rod or axial power shaping rod the shutdown margin will not be significantly affected.

It should also be noted that the change incorporates the requirement that all procedures that could result in CR or APSR movement will be reviewed and approved by NRC staff.

Therefore, it is the staff's opinion that with the present boron concentration in the reactor coolant system, and the basis for which the 3000 ppm lower limit was derived in addition to all procedures for rod movement being approved by NRC staff, the proposed amendment of section 3.1.3.1 of the Proposed Technical Specifications is acceptable. This change will not result in a significant increase in the probability or consequence of accidents previously considered nor a significant reduction in a margin of safety and does not therefore involve a significant hazards consideration.

The staff's safety assessment of this matter is set forth in the concurrently issued Safety Evaluation. This evaluation concluded, in material part, that the modification does not involve a significant hazards consideration and that there is reasonable assurance that the health and safety of the public will not be endangered by operation in the modified manner. Prior public


notice of this Amendment of Order is therefore not required and the action is effective upon issuance.

It was further determined that the modification does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. In light of this determination, it was concluded that the instant action is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5 (d)(4), that an environmental impact statement or environmental impact appraisal need not be prepared herewith.

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, the Director's Order of February 11, 1980, is hereby revised to incorporate the deletions, additions, and modifications set forth in Attachment A hereto. For further details with respect to this action, see (1) Letter to B. Snyder, USNRC, from R. Arnold, Met-Ed/GPU, Technical Specification Change Request No. 37 dated April 8, 1982 and (2) The Director's Order of February 11, 1980.

All of the above documents are available for inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C., and at the Commission's Local Public Document Room at the State Library of Pennsylvania, Government Publications Section, Education Building, Commonwealth and Walnut Streets, Harrisburg, Pennsylvania 17126.

FOR THE NUCLEAR REGULATORY COMMISSION



Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Effective Date: May 17, 1982
Dated at Bethesda, Maryland

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

GPU NUCLEAR CORPORATION

METROPOLITAN EDISON COMPANY

PENNSYLVANIA ELECTRIC COMPANY

JERSEY CENTRAL POWER AND LIGHT COMPANY

DOCKET NO. 50-320

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 2

Introduction

By letter dated April 8, 1982, (Reference 1) the licensee requested changes to the Proposed Technical Specifications Appendix A, for Three Mile Island, Unit 2 (TMI-2). The proposed amendment would allow for the movement of individual control or axial power shaping rods for the purpose of obtaining information on core conditions. Presently all rod ~~movements~~ are prohibited by the requirements of Proposed Technical Specification Section 3.1.3.1 which states that all control rod drive breakers shall be open. This section provided assurance that no reactivity changes would be made as a result of rod motion. However, recovery operations have progressed to the point that more information is needed that can be used to infer the condition of the core for planning subsequent cleanup and recovery operations. In addition, the axial power shaping rods must be fully inserted into the core and decoupled before the reactor vessel head is removed. If full insertion cannot be made, special tooling and procedures must be developed before the head can be lifted. Planning for these special conditions should begin early in the recovery process.

Summary

The licensee has requested NRC staff approval to allow for the movement of individual control rods or axial power shaping rods under the requirements of NRC approved operating procedures. The purpose of the movement is to gain

advanced information on core conditions that may aid in planning the methodology to be used for future recovery efforts. Also, prior to head removal, it will be necessary to decouple the APSR lead screws. This can most easily be accomplished if the rods are first fully inserted. Therefore inserting the APSR's at this time on an individual basis is a step that must be performed sometime during the cleanup. The licensee has requested to do this step now and the staff concurs. The staff has reviewed the potential effects on the core by this movement and finds that reactivity changes are insignificant and will not affect the demonstrated shutdown status of the core. Therefore we find the proposed change acceptable.

Evaluation

By Order of the Director, Office of Nuclear Reactor Regulation, dated February 11, 1980 a new set of formal license requirements were imposed to reflect the post accident condition of the TMI-2 facility. The order required in section 3.1.3.1 that all control rod drive breakers remain open to prevent rod drive movement. NRC analysis (Reference 2) has shown that by maintaining a boron concentration of at least 3,000 ppm, which is currently required in Proposed Technical Specification section 3.1.1.2, that the maximum K_{eff} would be 0.944, providing an adequate shutdown margin. Even more conservatively, Reference 3 shows that with a boron concentration of 3500 ppm, the core will remain subcritical with $K_{eff} < 0.90$ in any physically reasonable rearrangement of the fuel. References 2 and 3 assume the absence of all control rods and burnable poisons when calculating the K_{eff} values. As verified by reactor coolant system sampling, the licensee has consistently been maintaining a boron concentration of approximately 3800 and thereby assuring even more shutdown margin than required by the recovery

technical specifications. Therefore the staff concludes that any single rod movement will have a minimal effect on the required boron concentration and shutdown margin.

All control rod mechanism energizing and subsequent movement will be controlled by NRC approval of procedures and accompanying safety reviews for specific tasks being performed. The procedures will limit one mechanism being energized at a time and require upgraded surveillance to assure that no unexpected change in core conditions occurs.

Environmental Considerations

We have determined that the change does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the change involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR 51.5 (d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this change.

Conclusion

Based upon our analysis of the shutdown margin for the TMI-2 core relative to the present and required boron concentration, the staff finds that the modification of proposed Technical Specification Section 3.1.3.1 is acceptable. The associated bases have also been modified as requested by the issuance.

We have also concluded, based on the considerations discussed above, that:

(1) because the change does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, it does not involve a significant hazards consideration,

(2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and

(3) such activities will be conducted in compliance with the Commission's regulations and the implementation of this change will not be inimical to the common defense and security or to the health and safety of the public.

REFERENCES

- 1) GPU Nuclear letter from R.C. Arnold to B.J. Snyder, Director, TMI Program Office; April 8, 1982.
- 2) Memorandum from Charles R. Marotta, Sr. Criticality and Shielding Engineer, Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, to Norman Haller, Director Office of Management and Program Analysis; Nonconservative Reference - K eff of TMI-2 Core as Given in Special Task Force Report," Evaluation of the Cleanup Activities at Three Mile Island, April 1, 1980.
- 3) Memorandum from Raymond DiSalvo, Probabilistic Analysis Staff, RES, to Robert Bernero, Director, Probabilistic Analysis Staff, RES; TMI-2 Hazard Evaluation, April 4, 1980.

FACILITY OPERATING LICENSE NO. DPR-73

DOCKET NO. 50-320

Replace the following pages of Appendix "A" Proposed Technical Specifications with the enclosed pages as indicated. The revised pages contain vertical lines indicating the area of change.

Pages

3.1-3

B3/4 1-1

LIMITING CONDITIONS FOR OPERATION

3.1.3 CONTROL ASSEMBLIES

MECHANISM (ENERGIZATION)

3.1.3.1 All control rod drive mechanisms shall be deenergized except that one mechanism at a time may be energized as allowed by procedure(s) approved by the NRC staff in accordance with Technical Specification 6.8.2.

APPLICABILITY: When fuel is in the reactor pressure vessel.

ACTION:

None except as provided in Specification 3.0.3.

3/4.1 WATER INJECTION COOLING AND REACTIVITY CONTROL SYSTEMS

BASES

3/4.1.1 BORATION CONTROL

The limitation on minimum boron concentration ensures that the core will remain subcritical under all possible conditions which may exist during the long-term cooling mode. The maximum boron concentration is provided to ensure that precipitation of boron will not occur in the reactor coolant system and thereby cause possible flow restrictions. The specification requiring the OPERABILITY of two systems capable of injecting borated cooling water into the Reactor Coolant system are provided to ensure that makeup water can be injected into the reactor coolant system and that the reactor coolant will be maintained within the required boron concentration limits. The required volume of borated water in the BWST provides sufficient water to cool the core via low pressure injection for at least three days, during which time alternate cooling means could be provided.

3/4.1.3 CONTROL ASSEMBLIES

Normally maintaining the control rod drive mechanisms deenergized provides assurance that the rods will not be inadvertently withdrawn. Preparation of specific procedure(s) to allow energizing individual mechanisms and obtaining NRC approvals ensures sufficient evaluation and attention has been paid to assure the health and safety of the public.