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November 8, 1979
GQL 1400

TMI Support
Attn: Richard Vollmer, Director
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Sir:

Three Mile Island Nuclear Station, Unit 1 (TMI-1)
License No. DPR-50
Docket No. 50-289
TMI Restart Questions

Enclosed please find 10 copies of the response to your letter of October 31, 1979 concerning improvements in management control of operational activities. The following information will be included in the next amendment to the "TMI-1 Restart Report".

Sincerely,

J. G. Herbein
Vice President-Nuclear Operations

JGH:LWH:rt

Enclosures

cc: J. T. Collins
H. Silver
R. Reid

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QUESTION:

Information Required for the TMI-1 Restart Review

The staff review of your operational activities for the Three Mile Island Nuclear Station prior to and including the TMI-2 accident indicates a significant number of potential non-compliance items that place in question the adequacy of your management controls. These potential non-compliance items can be generally categorized as failure to adhere to Technical Specification requirements, failure to meet certain NRC Regulations, and failure to follow established procedures. Specific examples of such items are found in Appendices I-B and II-F of NUREG-0600.*

In view of the above, describe the specific measures you have taken, or plan to take, to demonstrate that the Metropolitan Edison Company has established a clear commitment to operational safety through significant improvements in the management control of operational activities. Measures to be described should include, but not be limited to:

1. Organizational changes to improve management controls.
2. upgrading of management and technical qualifications.
3. Changes to review and approve provisions for plant and emergency procedures.
4. Improvements in the review and audit programs for plant activities.
5. Independent verifications of operational activities affecting safety.
6. Establishment of and/or revisions to training programs for all levels of management and technical personnel involved with operation of the TMI NS.
7. Greater involvement of corporate management and staff in operational activities.
8. Upgrading of the operational quality assurance program.

* Investigation into the March 28, 1979 Three Mile Accident by Office of Inspection and Enforcement.

Following the TMI-2 accident, Metropolitan Edison Company recognized through its own and other investigations of the accident that major organizational changes were desirable for more effective management control. These changes indicate Met-Ed's commitment to operational safety and provide significant improvement in the control of operational activities, and the technical and management resources directing and supporting facility operations.

The first step taken was to combine the technical and management resources of Met-Ed and GPU Service Corporation Generation Divisions into a single organizational entity identified as the TMI Generation Group.

The TMI Generation Group was formed on July 30, 1979, to strengthen the overall management and provide greatly increased technical resources for the restart of TMI Unit 1 and the recovery of TMI Unit 2. The Group is headed by R. C. Arnold. To effect this new organization, Mr. Arnold was elected to the position of Senior Vice President of Met-Ed, and he continues to serve as a Vice President of GPU Service Corporation. In this position, Mr. Arnold reports to Herman M. Dieckamp, President of GPU and GPUSC, and acting president of Met-Ed. This reporting structure provides a direct link from the Chief Operating Officer of these three companies to the activities at TMI. A primary objective of the TMI Generation Group is to insure that NRC Regulations, Technical Specifications and established procedures are adhered to. As head of the TMI Generation Group, Mr. Arnold directly supervises the following functional groups.

THE MET-ED NUCLEAR OPERATIONS

The head of this group, Mr. J. G. Herbein, Vice President - Nuclear Operations (Plant Manager) is serving full time at TMI and his responsibilities and functions are described in Section 5.2.1.

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Formerly, Mr. Herbein held the position of Vice President - Generation, Met-Ed, where he had the responsibility for directing the engineering, operations and maintenance of Met-Ed's fossil fuel and nuclear power plants.

The organization formed under Mr. Herbein's direction specifically gives the Unit 1 Superintendent only the responsibility for operation and maintenance and relieves him of direction of administration, training, engineering, radiation protection and chemistry functions.

TECHNICAL FUNCTIONS

The Technical Functions Group, directed by Mr. R. F. Wilson, provides off-site technical support to TMI operations. This includes engineering and design support for Unit 1 equipment modifications, systems engineering and safety analysis.

The Engineering and Design Department of the Group is organized into the following sections:

- Electrical Power and Instrumentation

- Mechanical System Engineering

- Engineering Mechanics

- Mechanical Components Engineering

The System Engineering Department is organized into the following sections:

- Control and Safety Analysis

- Process Computer

- Nuclear Analysis and Fuels

- Plant Analysis

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The Plant Analysis section has been specifically established to focus on systematic review of the performance of plant systems and to provide corporate direction of site engineers who will be monitoring, independent of operation personnel, plant performance on a daily basis.

A TMI Engineering Management section has also been established in the Technical Functions Group to provide direct liaison and coordination between corporate engineering support and the plant engineering activities. In addition, a very experienced engineer, formerly in a supervisory position, has been assigned on a full time basis as Chairman of the Generation Review Committee to direct independent technical review of site modifications, procedure changes and plant experiences relating to nuclear safety.

MAINTENANCE

The Director-Maintenance, Mr. J. L. C. Bachofer, Jr., is heading the on-site maintenance organization which has the responsibility to support TMI Unit 1 in the areas of Corrective Maintenance, Emergency Maintenance, Maintenance Procedures and Methods, Tools and Equipment, and Machinery History. Additionally, Mr. Bachofer is providing assistance to TMI Unit 1 in the construction of plant modifications, controls estimating/cost engineering, craft labor relations, and the coordination of transportation requirements.

ENVIRONMENT, HEALTH AND SAFETY

The Director - Environment, Health and Safety, Mr. J. R. Thorpe, provides both on-site and off-site support to TMI Unit 1 in the functional areas of Nuclear Licensing, Environmental Engineering, and Environmental Impact Assessment.

RELIABILITY ENGINEERING

The Reliability Engineering Group, directed by Dr. R. L. Long, provides off-site and on-site Quality Assurance and System Laboratory support to the

TMI Unit 1 operations. The Quality Assurance Department provides technical assistance to TMI Unit 1 in Methods and Operations, Materials Technology, Auditing, Design Assurance, Manufacturing Assurance as well as conducting appropriate quality control activities. The System Laboratory provides technical assistance to TMI Unit 1 in Environmental and Operational Chemistry and Chemistry.

THE TMI-2 RECOVERY ORGANIZATION

The Acting Director, TMI-2 Recovery, Mr. R. F. Wilson, provides overall management and direction for activities associated with the restoration of TMI-2 to operation. This organization will have an independent dedicated on-site staff necessary to conduct clean-up activities.

These changes have structured the organization so that substantially greater management resources are focused directly on TMI activities to insure adequate control of safety related activities. The current organization includes about 250 professional people with an average experience of about 13 years, composed with the approximately 75 professionals contained in the Met-Ed organization prior to the accident. To provide necessary involvement of corporate management and staff in operational activities, all the previously described groups have significant portions of their staffs located full time at TMI.

These changes, as well as improvements made in training, shift staffing, organizational status and staffing of the health physics departments of the two units, and strengthened administrative controls, are substantive and clear indications of Met-Ed's commitment to insure the safe operation of TMI-1.

The upgrading of the Operational Quality Assurance Program is discussed in Section 5.4, page 5-32 to 5-38 and Figure 5.4-1 and 5.4-2 of the TMI-1 Restart Report (Amendment 4). Major improvements have been made in the audit function with the establishment of an on-site QA Audit staff to better coordinate and manage audit activities and provide management with increased awareness of the adequacy and implementation of the QA Program. The following actions are being taken:

- A. Current auditing procedures are being revised to better define responsibilities, provide simplified audit reporting and better follow-up of problem areas.
- B. Surveillance and audit scheduling practices/procedures are being upgraded to provide an improved approach to coverage of activities affecting safety.
- C. Corrective action procedures for QA Audits are being put in place to provide guidance so that corrective actions result in measures which preclude recurrence.
- D. A computerized audit status system is being established to provide better management visibility of problem areas and to determine trends.
- E. A concerted effort to establish priorities of audit findings and to commit the appropriate level of management, via the post audit conference, is being put in place to provide corrective actions that insure the commitment of sufficient resources.

Independent verification of operational activities effecting safety are being assured by the following specific procedural requirements. These

requirements essentially provide a check and cross check system which provides the assurance that SFAS and EFW Systems will perform in accordance with established requirements whenever challenged.

These procedural requirements are outlined below:

- A. At each operations shift relief control room turnover, SFAS and EFW checklists that have been completed by the off going watch during shift are signed by both the on coming and off going control room operators. Completion of these SFAS and EFW checklists, which indicate both required and actual control room valve and switch position indications insures that all control room indications have been double checked to verify that SFAS and EFW Systems are in their ready to actuate status.

To verify in plant SFAS and EFW System valve positions, formal log sheets, indicating both required and as found SFAS and EFW valve positions will be completed by primary, secondary and out building auxiliary operators. SFAS and EFW valve positions in major SFAS and EFW System flow paths, which do not have control room position indication, will be verified and recorded on the log sheets either once a shift or once a day, depending on ease of accessibility and existing plant radiation levels.

Separate system status checklist requirements are also completed by the control room watch, primary plant, secondary plant and out building auxiliary operators during their

shift. These system status checklists are also reviewed and signed at shift turnover by the on coming and off going auxiliary operators and control room watch.

- B. At the completion of maintenance on SFAS and EFW Systems on independent system checklist is required to return the system maintained to full operational status. This checklist will encompass a specific system valve and breaker lineup within the boundaries in which maintenance was conducted. Additionally this checklist will require two independent review and signature verifications for correctness prior to its use in aligning the system in the field. Following this dual verification, the checklist will then be used in the field to return the system to full operational status.
- C. Following surveillance tests or special operations on SFAS and EFW Systems, two independent valve and breaker lineups will be conducted within the boundary of the system affected by the tests or special operations to provide assurance that the system is returned to full operational status.
- D. Surveillance testing and the required testing following maintenance on instrumentation associated with SFAS, EFW, Reactor Protection System (RPS), and Radiation Monitoring System (RMS) instrumentation, will be accomplished according to procedural requirements which will require the technician performing the instrumentation test steps to initial each procedure step as it is accomplished. Following the completion

and sign off of the Surveillance test by the technician, a supervisor will review the completed procedure to verify all steps have been initialed, and that data is appropriately recorded and is within the required procedure authorized limits. Following this review the supervisor will also sign the completed procedure and related data sheets. Signed data sheets and initialed procedures will be retained.

Changes to review and approval provisions for plant and emergency procedures have been improved by the assignment, as mentioned previously, of a full time Generation Review Committee (GRC) Chairman who has extensive utility engineering experience, a degree in Electrical Engineering and was formerly a member of the Oyster Creek GORB. The full time GRC Chairman will be responsible for executing review activities related to safety evaluations, procedure changes and violations of regulations. The function, composition, qualifications, quorum and meeting frequency of the GRC will be specified in a proposed change to the Unit 1 Technical Specifications.

In summary, the GRC will be composed of at least five members. Each will have an academic degree in Engineering or Physical Science with five years of technical experience. In view of the significant increase in both numbers of assigned professional personnel and years of experience the Generation Review Committee will have a strong technical base to provide in-depth support to insure that its functions are adequately executed.

In addition to the previously required Plant Operation Review Committee (PORC) review and Unit Superintendent approval required for nuclear safety related procedures, the Radiation Protection and Chemistry Supervisor or

another individual knowledgeable in Radiological Controls will attend all PORC meetings where Radiological Control procedures and practices are reviewed.

Following the TMI-2 accident, an experienced consultant who formerly held the position of Branch Chief of NRC Operator Licensing, conducted a review of operating and emergency procedures as well as plant training practices. As a result of this review, several significant recommendations were incorporated into the plant emergency procedures. These included an "objectives section" for each emergency procedure outlining in a clear, concise summary, the overall intent, goal, and directional thrust intended by the execution of the emergency procedure and its followup action. Additionally, as a result of this review, emergency procedure follow-up actions will reverify important plant parameters utilized to categorize plant symptoms and initiate immediate action. These key parameters will be verified a second time in the followup action utilizing, where possible, an alternate means of readout or indication. This will minimize the potential for misreading instruments and will provide a check on the accuracy of instruments read initially when evaluating emergency symptoms and executing the immediate action steps of emergency procedures. This effort has resulted in the emergency procedures being revised to provide a sharply focused emphasis on maintenance of adequate core cooling at all times.

As a part of our review, key emergency procedures were used by shift crews at the B&W Lynchburg Simulator. Where required, procedure changes were initiated to insure technical accuracy, clarity and consistence with actual plant simulator response. Additionally, guidelines from B&W have been incorporated in the emergency procedures relative to small break LOCA, natural circulation, inadequate core cooling, prevention of void formation, and the

high and low pressure injection modes of core cooling. Finally, the follow-up section of the emergency procedures has been expanded to include specific long term actions wherever appropriate.

Additional emphasis is being given to the area of training. The position of Manager of Training was established, reporting directly to the Vice President-Nuclear Operations with the responsibility to organize, develop and conduct training programs to meet the training requirements of the TMI Nuclear Station Unit 1. To assist the Manager of Training, a Supervisor of Operator Training and a Supervisor of Technical Training have been assigned to implement the operator and technician training programs.

Major emphasis has been placed on the establishment of a Management Training Program developed for management positions in the TMI-1 organization. The course content will include:

- A. Technical Specifications, Section 6.0
- B. Kemeny Commission Report
- C. Operational Quality Assurance Plan
- D. TMI Emergency Plan
- E. Health Physics
- F. Decay heat removal and heat transfer mechanisms including core decay heat generation
- G. Safety Analysis

Other training programs are outlined in Appendix I to this letter.

The above managerial and operational changes reflect our ongoing commitment to operational safety and awareness of the need to give clear visibility to that commitment. Safety will remain the chief concern of the

TMI Generation Group. The recommendations of the President's Commission on the Accident at Three Mile Island are being reviewed, as will be the forthcoming recommendations of the NRC/TMI Special Inquiry Group and other investigatory agencies, to assure the Company is appropriately responsive to all recommendations which relate to nuclear safety.

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APPENDIX I

A. Operator Training

1. Operator Accelerated Training Program

This program was established to train the operators to meet the restart requirements of TMI Unit 1. The OARP will be reviewed by a committee from the Nuclear Engineering Department, Penn State University to:

- a. Insure Technical and teaching quality
- b. Monitor and evaluate the program
- c. Critique the program goals and objectives in comparison to current practices, NRC Guidelines and the TMI-II event.

2. Operator Replacement Training

This program will be revised, as necessary, to incorporate the selected objectives of the Operator Accelerated Retraining Program.

3. Operator Requalification Program

This program will be revised, as necessary to meet the requalification standards set by the Nuclear Regulatory Commission.

4. Requalification of Operators in Radiological Controls

This program has been revised to better qualify the operator with respect to his responsibility in radiation protection.

5. Auxiliary Operator Training

Auxiliary Operator Training will be expanded in the following areas:

- a. Heat transfer
- b. Mechanical system and components
- c. Electrical systems and components

B. Radiation/Chemistry Technicians

1. Initial Radiation/Chemistry Technician Training

This program will be revised to increase the scope and quality of training.

2. Radiation/Chemistry Technician Requalification

This program will be improved to insure the qualifications of the technicians are maintained at an acceptable level.

C. Maintenance Personnel Training

This two year recurring training program has been established.

Maintenance Personnel will be trained in four phases, each of six months duration as follows:

- a. Maintenance Fundamentals
- b. Plant Systems Training
- c. Skills Specialty Training
- d. Practical Application Training

In addition, a special lesson is being given to indoctrinate maintenance personnel in the TMI-II transient. The lesson will also stress the ALARA concept.

D. Emergency Plan Training

1. Emergency Plan Training

This program will train all personnel designated in the revised Emergency Plan and the Emergency Plan Implementation procedures.

2. ECS Coordinator Training

This program was established to train the coordinator in his specific responsibilities during the various emergency levels set forth in the Plan.

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E. Technical Training for Shift Technical Advisors

This program has been established to train assigned personnel in their assigned accident and operating experience assessment functions.

F. General Employee Training

The General Employee Training Program has been revised to reflect revisions in:

- A. Security
- B. Site Emergency Plan
- C. Quality Assurance

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