Docket No. 50-346

Metropolitan Edison Company, Three Mile Island Nuclear Station, Unit No. 1

ORDER AND NOTICE OF HEARING

I. The Metropolitan Edison Company (the licensee) is holder of Facility Operating License No. DRR-50 which authorizes the operation of the nuclear power reactor known as Three Mile Island Nuclear Station, Unit No. 1 (the facility or TMI-1), at steady state power levels not in excess of 2535 megawatts thermal (rated power). The facility is a Babcock and Wilcox (B&W) designed pressurized water reactor (PWR) located at the licensee's site ten miles southeast of Harrisburg, Pennsylvania.

II. On July 2, 1979, the Commission ordered that the facility remain in a cold shutdown condition until further order of the Commission and stated that a hearing will be conducted prior to any restart of the facility. The Commission herein specifies the basis for its concerns and the procedures to govern further proceedings in this matter. For the reasons later set forth, the Commission has determined that satisfactory completion of certain actions and resolution of various concerns described herein are required to provide reasonable assurance that the facility can be operated without endangering the health and safety of the public. The Commission has determined that certain additional long-term actions are, for the reasons given below, required to be completed as promptly as practicable in order to provide reasonable assurance that the facility can be operated safely over the long term. This Order and notice of hearing further establishes procedures for a hearing and decision on the particular issues

identified in Section IV of this Order. The Commission has determined that hearing and decision (with review thereof) on the issues relating to the actions required prior to restart of the facility must be completed prior to any Commission Order lifting the suspension of operation.

Accordingly, the Atomic Safety and Licensing Board designated to conduct this proceeding should give priority to consideration of those issues which are related directly to suspension of operation. To the extent feasible, the Board should defer on the issues related to the longer-term actions until after the rendering of a partial initial decision regarding the suspension-related issues.

The Commission's July 2, 1979 Order recited that "the Commission presently lacks the requisite reasonable assurance that the . . . Licensee's Three Mile Island Unit No. 1 Facility . . . can be operated without endangering the health and safety of the public." The bases for that conclusion (which remains valid) are:

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In the course of its evaluation to date of the accident at the Three Mile Island Unit No. 2 facility, which utilizes a B&W designed PWR, the Nuclear Regulatory Commission staff has ascertained that B&W designed reactors appear to be unusually sensitive to certain off-normal transient conditions originating in the secondary system. The features of the B&W design that contribute to this sensitivity are: (1) design of the steam generators to operate with relatively small liquid volumes in the secondary side; (2) the lack of direct initiation of reactor trip upon the occurrence of off-normal conditions in the feedwater system; (3) reliance on an integrated control system (ICS) to automatically regulate

feedwater flow; (4) actuation before reactor trip of a pilot-operated relief valve on the primary system pressurizer (which, if the valve sticks open, can aggravate the event); and (5) a low steam generator elevation (relative to the reactor vessel) which provides a smaller driving head for natural circulation.

Because of these features, B&W designed reactors place more reliance on the reliability and performance characteristics of the auxiliary feedwater system, the integrated control system, and the emergency core cooling system (ECCS) performance to recover from frequent anticipated transients, such as loss of offsite power and loss of normal feedwater, than do other PWR designs. This, in turn, places a large burden on the plant operators in the event of off-normal system behavior during such anticipated transients.

As a result of a preliminary review of the Three Mile Island Unit No. 2 accident chronology, the NRC staff initially identified several human errors that occurred during the accident and contributed significantly to its severity. All holders of operating licenses, except Metropolitan Edison, whose plants were already shutdown, were subsequently instructed to take a number of immediate actions to avoid repetition of errors, in accordance with bulletins issued by the Commission's Office of Inspection and Enforcement (IE). In addition, the NRC staff began an immediate reevaluation of the design features of B&W reactors to determine whether additional safety corrections or improvements were necessary with respect to these reactors. This evaluation involved numerous meetings with B&W and certain of the affected licensees.

The evaluation identified design features as discussed above which indicated that B&W designed reactors are unusually sensitive to certain off-normal transient conditions originating in the secondary system. As a result, an additional bulletin was issued by IE which instructed holders of operating licenses for B&W designed reactors to take further actions, including immediate changes to decrease the reactor high pressure trip point and increase the pressurizer pilot-operated relief valve setting. Also, as a result of this evaluation, the NRC staff identified certain other safety concerns that warranted additional short-term design and procedural changes at operating facilities having B&W designed reactors. These were identified as items (a) through (e) on page 1-7 of the Office of Nuclear Reactor Regulation Status Report to the Commission of April 25, 1979.

In addition to the items identified for the other B&W reactors, the unique circumstances at TMI require that additional safety concerns identified by the NRC staff be resolved. These concerns result from (1) potential interaction between Unit 1 and the damaged Unit 2, (2) the impact of the Unit 2 accident on the management and technical resources of Metropolitan Edison, (3) the operations necessary to decontaminate the Unit 2 facility, and (4) recognized deficiencies in emergency plans and station operating procedures. Assurance must be provided that these items, 1-4, which could have an impact on the safety of operating Unit 1 in addition to the technical features already identified for the other B&W plants, be resolved prior to restart.

Based on the above, the Commission's Director of Nuclear Reactor Regulation (NRR) has recommended that the following actions (the "short-term actions") be required of the licensee to resolve the concerns stated herein and permit a finding of reasonable assurance that the facility can safely resume operation.

1. The licensee shall take the following actions with respect to TMI-1:

(a) Upgrade the timeliness and reliability of the Emergency Feedwater (EFW) system by performing the items specified in Enclosure 1 of the licensees June 28, 1979 letter. Changes in design will be submitted to the NRC staff for review.

(b) Develop and implement operating procedures for initiating and controlling EFW independent of Integrated Control System (ICS) control.

(c) Install a hard-wired control grade reactor trip on loss of main feedwater and/or on turbine trip.

(d) Complete analyses for potential small breaks and develop and implement operating instructions to define operator action.

(e) Augment the retraining of all Reactor Operators and Senior Reactor Operators assigned to the control room including training in the areas of natural circulation and small break loss of coolant accidents including revised procedures and the TMI-2 accident. All operators will also receive training at the B&W simulator on the TMI-2 accident and the

licensee will conduct a 100 percent reexamination of all operators in these areas. NRC will administer complete examinations to all licensed personnel.

2. The licensee shall provide for NRC review and approval all applicable actions specified in IE Bulletins 79-05A and 79-05B.

3. The licensee shall improve his emergency preparedness in accordance with the following:

   (a) Upgrade emergency plans to satisfy Regulatory Guide 1.101 with special attention to action level criteria based on plant parameters.

   (b) Establish an Emergency Operations Center for Federal, State and Local Officials and designate a location and an alternate location and provide communications to plant.

   (c) Upgrade offsite monitoring capability, including additional thermo-luminescent dosimeters or equivalent.

   (d) Assess the relationship of State/Local plans to the licensee plans so as to assure the capability to take emergency actions.

   (e) Conduct test exercise .

4. The licensee shall take actions required to demonstrate that planned decontamination and/or restoration operations at TMI-2 will not impact safe operations at TMI-1. The licensee shall provide separation and/or isolation of TMI 1/2 radioactive liquid transfer lines, fuel handling areas, ventilation systems, and sampling lines. Effluent monitoring instruments shall have the capability of discriminating between effluents resulting from Unit 1 or Unit 2 operations.

5. The licensee shall demonstrate that the waste management capability, including storage and processing, for solid, liquid, and gaseous wastes is adequate to assure safe operation of TMI-1, and that TMI-1 waste handling capability is not relied on by operations at TMI-2.

6. The licensee shall demonstrate his managerial capability and resources to operate Unit 1 while maintaining Unit 2 in a safe configuration and carrying out planned decontamination and/or restoration activities. Issues to be addressed include the adequacy of groups providing safety review and operational advice, the management and technical capability and training of operations staff, the adequacy of the operational Quality Assurance program and the facility procedures, and the capability of important support organizations such as Health Physics and Plant Maintenance.

7. The licensee shall demonstrate his financial capability to operate TMI-1 at the TMI 1/2 complex.

8. The licensee shall comply with the Category A recommendations as specified in Table B-1 of NUREG-0578.

The Commission has additional concerns, which, though they need not be resolved prior to resumption of operation at Three Mile Island Unit 1, must be satisfactorily addressed in a timely manner. The Commission's Director of Nuclear Reactor Regulation (NRR) has recommended that the following actions (the "long-term actions") be required of the licensee to resolve these concerns and permit a finding of reasonable assurance of the safety of long-term operation. These are:

1. submit a failure mode and effects analysis of the ICS to the NRC staff as soon as practicable;
2. give continued attention to transient analysis and procedures for management of small breaks by a formal program set up to assure timely action of these

matters;

3. comply with the Category B recommendations as specified in Table B-1 of NUREG-0578; and,
4. improve emergency preparedness in accordance with the following:
   (a) modify emergency plans to address changing capabilities of plant instrumentation,
   (b) extend the capability to take appropriate emergency actions for the population around the site to a distance of ten miles.

In addition, the licensee shall also provide, but not prior to restart, timely response and implementation of longer term recommendations which may result from the Lessons Learned Task Force as well as recommendations that may arise from the Presidential Commission, the NRC's ongoing investigations, and other studies unless such recommendations are determined by the Director of the Office of Nuclear Reactor Regulation to be required prior to restart.

III. Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's rules and regulations in 10 C.F.R., it is hereby ordered that:
the licensee shall maintain TMI-1 in a cold shutdown condition until satisfactory resolution of the concerns, identified above, which led the Commission to suspend the licensee's authority to operate.