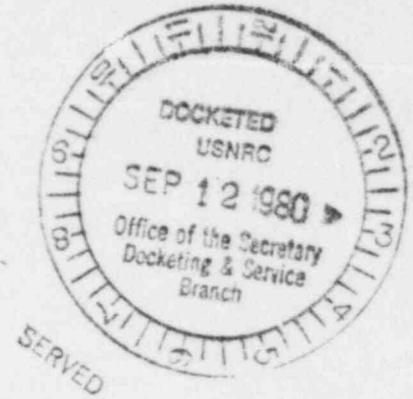


UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Ivan W. Smith, Chairman  
Dr. Walter H. Jordan  
Dr. Linda W. Little



In the Matter of )  
METROPOLITAN EDISON COMPANY ) Docket No. 50-289 SP  
(Three Mile Island Nuclear ) (Restart)  
Station, Unit No. 1) )

MEMORANDUM ON BOARD QUESTIONS

(September 12, 1980)

The following is a specification of the board questions to be addressed in advance written responses and at the hearing by the staff and the licensee, unless otherwise indicated by the question. Other parties may respond to board questions which are related to their interest. Not all of these questions will be heard during the first hearing segment. Those that will be heard during the first segment have been specified in our Memorandum and Order of September 8, 1980. The questions were discussed during the prehearing conference of August 12 and 13, 1980, at the referenced transcript pages. It is possible that other questions will be asked by the board in advance of segments of the evidentiary hearing.

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The board's questions to date follow:

1. (Tr. 2390-92) Prior to the opening of the evidentiary hearing, the staff should inform the board as to when the staff will take a position on the applicability to this proceeding of NUREG-0694, "TMI-Related Requirements for New Operating Licenses". The following items in NUREG-0694 and/or NUREG-0660, "Action Plans for Implementing Recommendations of the President's Commission and Other Studies of TMI-2 Accident", are of particular interest to the board:
  - a. I.D.1 -- Control Room Design (following a human factors analysis).
  - b. II.E.1.1 -- Auxiliary Feedwater System (reliability evaluation using event-tree logic).
  - c. II.B.8 -- Rulemaking proceeding on degraded core accidents.
  - d. II.B.7 -- Analysis of response of containment structures to hydrogen explosions. Do the proposals for hydrogen control for Sequoyah, which include "spark plugs", have any applicability to TMI-1?

2. (Tr. 2392) The board stated its concern with having an adequate record on the sufficiency of the proposed short-term and long-term actions to protect the health and safety of the public.

Without further explanation the question may appear to invite conclusionary testimony on the ultimate factual issues to be decided by the board. (Commission's August 9, 1979 order, 10 NRC 141, 148.) This is not what the board has in mind as a response to the question. Our concerns were expressed in part in the June 23, 1980 memorandum on the staff's report on TMI-1 accident sequences. To explain further: We assume that the staff and licensee may present evidence that each Category A and each Category B recommendation in Table B-1 of NUREG-0578 (Order items ST 8 and LT 3), and that each preventative and mitigative measure identified with respect to a given accident sequence in the staff's TMI-1 Core Damage Accident Sequence Report will be, at least, sufficient to resolve the related safety problem or accident sequence. However, nowhere have we seen in the Restart Report, SER, the accident sequence report, or elsewhere, an explanation as to how the staff or licensee has determined that all of the necessary TMI-2 related recommendations have been identified and that all the appropriate accident sequences have been addressed. The board wants testimony or other evidence

which explains, if such be the case, how the licensee and the staff have concluded that the NUREG-0578 short and long-term recommendations, other subsequent safety recommendations, and the identified accident sequences (with their respective preventative or mitigative measures) are in their totality sufficient to provide reasonable assurance that TMI-1 can be operated without endangering the health and safety of the public. The question is not intended to enlarge the scope of the hearing. The response may be limited to consideration of accidents following a loss-of-feed-water transient.

3. (Tr. 2392) The results of the Interim Reliability Evaluation Plan (IREP), as applied to Crystal River, was scheduled for completion in July 1980. (The board wants to receive a copy of this report.)

- a. When will the IREP be applied to TMI-1?
- b. Does the IREP address the adequacy of the proposed actions for B&W plants?

4. (Tr. 2393)

- a. Has the licensee considered stationing a limited number of dose rate meters near the site, with the data telemetered to the control room or the response center?

- b. Has the licensee considered placing meters which publicly measure background radiation levels at a number of public places, thereby enabling the populace to know what the level is?
5. (Tr. 2393-94) When does the staff plan to report on its review of NUREG-0660 as applied to TMI-1? (The board and the parties should be kept informed as quickly as the staff has identified any additional action plans that should be required for implementation, either before any proposed restart or for the long-term.)
6. (Tr. 2394-96) Emergency Feedwater Reliability
  - a. Is a loss of emergency feedwater following a main feedwater transient an accident which must be protected against with safety-grade equipment? Would such an accident be caused or aggravated by a loss of non-nuclear instrumentation, such as occurred at Oconee?
  - b. In what respect is the emergency feedwater system vulnerable to non-safety-grade system failures and to operator errors?
  - c. What has been the experience in other power plants with failures of safety-grade emergency feedwater systems, if they have such systems in other power plants?

- d. What operator action is required to operate in a feed-and-bleed mode following a loss of emergency feedwater?
- e. If the emergency feedwater system were to fail, what assurance do we have that the system can be cooled by the feed-and-bleed mode? This is of particular concern if the PORV's and safety valves have not been tested under two-phase mixtures.
- f. Can the system be taken to cold shutdown with the feed-and-bleed cooling only? Are both high pressure injection (HPI) pumps required to dissipate the decay heat in the feed-and-bleed mode? The board would like an evaluation of the reliability of the feed-and-bleed system. Has there been any experience using that system?
- g. If there is a loss of steam in the secondary system which results in failure of the turbine-driven feedwater pumps, will both motor-driven pumps be required to supply the requisite amount of feedwater? Does this meet the usual single-failure criteria since it appears that a redundant system requires multiple components to operate?
- h. Can the turbine driven pumps and valves be operated on Direct Current, or are they dependent upon the Alternating Current safety buses?

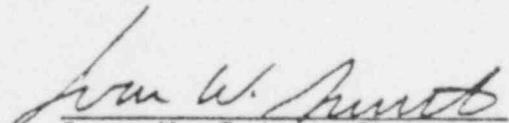
- i. Will the reliability of the emergency feedwater system be greatly improved upon conversion to safety-grade, and is it the licensee's and staff's position that the improvement is enough such that the feed-and-bleed back-up is not required?
  - j. Will the short-term actions proposed improve the reliability of the emergency feedwater system to the point where restart can be permitted?
  - k. Question 6 should be addressed with reference to Florida Power & Light Co. (St. Lucie, Unit 2), ALAB-603, (July 30, 1980); i.e. whether loss of emergency feedwater is a design basis event notwithstanding whether design criteria are met.
7. (Tr. 2396) Following the investigation of the Crystal River incident, the staff issued NUREG-0667, "Transient Response of Babcock & Wilcox-Designed Reactors". Which of the recommendations in Table 2.1 of that report does the staff believe should be implemented for TMI-1 prior to start-up, which should be included in the long-term actions, and which, if any, are not needed for TMI-1 and why not?

8. (Tr. 2397) Even though no contentions survive on the issues raised by short-term Item 4 of the Commission's August 9, 1979 order, the board wants testimony presented on the issue raised by this item. Short-term Item 4 requires:

The licensee shall demonstrate that decontamination and/or restoration operations at TMI-2 will not affect 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. [Emphasis added.]

9. (Tr. 2397-98)
- a. What measures are taken to monitor groundwater quality at the site?
  - b. What measures are taken to ensure against contamination of the groundwater under routine operations, accident conditions, and clean-up operations?
  - c. Is there any evidence at the present time of changes in the groundwater quality, including but not limited to radioactivity and boron, attributable to operations at TMI-1 and/or 2?

- d. If changes in groundwater quality have occurred, distinguish, if possible, the sources of any contamination, i.e., routine operations at Unit 1, routine operations at Unit 2, unplanned or accident conditions at Unit 1, unplanned or accident conditions at Unit 2, or clean-up operations.
  - e. What mitigative measures are available, should groundwater contamination occur?
10. (Tr. 2064-69)
- a. Explain how the June 27, 1980 accident occurred. Include a better explanation of what work was being done at the time, the operator error involved and why the leakage was not stopped before 10,000 gallons of water accumulated.
  - b. Discuss the effect and relationship, if any, of the leak on the separation of storage facilities between the two units.
  - c. Provide narrative testimony on the past two years' maintenance history, (so as to include the last year of operation), of any particular maintenance problems that have surrounded the make-up and purification systems and the once-through steam generators.

  
Ivan W. Smith, Chairman