

February 21, 1980

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

LICENSEE'S RESPONSES TO  
UCS INTERROGATORIES NOS. 38, 39  
48, 49, 113-25, and 146

Introductory Comments

UCS's set of interrogatories dated January 4, 1980, requests that with respect to each contention Licensee first answer five preliminary questions. The first four of these five questions relate to Licensee's position on the contention. Licensee's position on the contentions will not be finally developed until testimony has been drafted, reviewed and finalized by Licensee and its contractors. Consequently, answers to these four preliminary questions are not available at this time. However, UCS will find that Licensee's basic disagreement with each contention is reflected in answers to other interrogatories pertaining to the contention.

UCS also requests with respect to each interrogatory the identity of and other information concerning expert(s) whom Licensee intends to have testify on the subject matter of the interrogatory. No such expert witnesses have been identified

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by Licensee at this time. When expert witnesses have been identified, Licensee will so notify UCS.

Unless otherwise indicated below, further research or work engaged in or to be engaged in by or for the Licensee which may bear on the issues covered in these interrogatories is identified in the Licensee's Restart Report and the Staff's "Status Report on the Evaluation of Licensee's Compliance with the NRC Order dated August 9, 1979", dated January 11, 1980.

Interrogatory No. 38

Explain why the addition of the pressurizer heater to the on-site emergency power supplies will not degrade the capacity, capability and reliability of the on-site emergency power source in violation of GDC 17.

Response

- (A) The addition of the pressurizer heater to the on-site emergency power supply is described in the Restart Report section 2.1.1.3. This additional load is applied manually to the emergency power supply, and the protective measures to be taken when applying this load are described in the Restart Report section 2.1.1.3. A new diesel load study was performed as part of the Restart Report to insure that the on-site emergency power supplies can handle the capacity. Table 3-1

in Supplement 1, Part 1, question 3 of the Restart Report describes the loading on the on-site emergency power supply. By tripping non-essential loads as described in the Restart Report, the pressurizer heater load can then be applied to the on-site emergency power supply without degrading the capacity, capability or reliability of the on-site emergency power source.

NOTE: The loading described in Table 3-1 of the Restart Report is based on the large break LOCA, in which case pressurizer heaters are not required. For small breaks or loss of offsite power only, when the pressurizer heaters may be utilized, the pumping/motor horsepower requirements result in loads less than those listed in the Table. Therefore, additional margin exists.

- (B) TMI-1 Restart Report, Section 2.1.1.3, Supplement 1, Part 1, Question 3.
- (C) None.
- (D) See introductory comments.
- (E) See introductory comments.

Interrogatory No. 39

Would installation of an independent and redundant on-site emergency power supply for the pressurizer heater provide greater reliability of power supply to pressurizer heaters? Explain your answer fully.

Response

- (A) As indicated in the Response to Interrogatory No. 38 above, and described in the Restart Report, provisions are being made for addition of the pressurizer heater load to the on-site emergency power supply. The on-site emergency power supply is a redundant power source, designed to supply the Engineered Safeguards loads. Its reliability has been demonstrated by monthly surveillances since TMI-1 began operation in 1974. An additional independent on-site emergency power supply for the pressurizer heaters is not required.
- (B) Final Safety Analysis Report, Three Mile Island - Unit 1, Section 15.4.6.1.
- (C) None.
- (D) See introductory comments.
- (E) See introductory comments.

Interrogatory No. 48

Explain how the motive and control components of the PORV's and their associated block valves and the vital instruments shall be supplied by the on-site emergency power source when off-site power is not available without degrading the capacity, capability and reliability of emergency power in violation of GDC 17.

Response

(A) The motive and control components of the PORV and its associated block valve and the vital instruments are supplied by the on-site emergency power source when off-site power is not available as follows:

1. The motive and control components of the PORV are supplied from the 1C DC distribution panel.
2. The motive and control components of the PORV block valve are supplied from the 1C Engineered Safeguards Valve Motor Control Center.
3. The vital instrumentation is supplied from distribution panels VBA, VBB, VBC, and VBD.

Refer to FSAR Section 8, Figures 8-3 and 8-4 to see how the above loads are connected to the on-site emergency power source. These loads were included in the design of the

TMI-1 on-site emergency power source, and have always been designed to be supplied by the on-site emergency power source when off-site power is not available, without degrading the capacity, capability and reliability of emergency power.

- (B) Restart Report Section 2; FSAR Section 8
- (C) None.
- (D) See introductory comments.
- (E) See introductory comments.

Interrogatory No. 49

How have the devices through which motive and control power components for the PORV's and their associated block valves are connected to emergency buses been qualified in accordance with safety-grade requirements?

Response

- (A) The devices through which motive and control power components for the PORV and its associated block valve are connected to emergency buses are identical to the devices used for the Engineered Safeguards components. As such, the qualifications applicable to the Engineered Safeguards components are also applicable to the devices through which motive and control power components for the PORV's and their

associated block valves are connected to emergency buses.

- (B) FSAR Section 8.
- (C) None.
- (D) See introductory comments.
- (E) See introductory comments.

Interrogatory No. 113

With respect to TMI-1, list the "structures, systems, and components important to safety" within the containment and auxiliary buildings to which GDC 4 presently applies.

Response

- (A) TMI-1 was designed and constructed taking into consideration the General Design Criteria (GDC) listed in 10 C.F.R. 50, Appendix A, as issued on July 11, 1967. The FSAR describes compliance to the original criteria. See also, Response to Interrogatory No. 112. Licensee is in the process of compiling a list of structures, systems and components within the containment and auxiliary buildings which are important to safety, and will furnish the list when completed.

- (B) 1. Final Safety Analysis Report, Three Mile Island - Unit 1, Sec. 7.
- 2. 10 C.F.R. 50, Appendix A.
- (C) None.
- (D) See introductory comments.
- (E) See introductory comments.

Interrogatory No. 114

What were before TMI-2 and are now the maximum environmental parameters which each such GDC 4 structure, system and component is qualified to withstand? Explain fully any discrepancies and provide relevant documentation.

Response

- (A) A discussion of environmental qualification of equipment is contained in the TMI-1 FSAR. The maximum environmental parameters of qualification are those as reported in the FSAR. See also Response to Interrogatory No. 112. A further response to this Interrogatory will be supplied when Licensee's response to Interrogatory No. 113 is completed.
- (B) Final Safety Analysis Report, Three Mile Island - Unit 1, Sec. 7.

- (C) None.
- (D) See introductory comments.
- (E) See introductory comments.

Interrogatory No. 115

To what extent did the actual accident conditions at TMI-2 exceed the past and/or present maximum environmental parameters for each such structure, system and component discussed in Question #113?

Response

- (A) The environmental parameters to which the structures, systems, and components were qualified are given in the TMI-1 FSAR. These parameters are pressure, temperature, humidity and radiation. The Licensee is attempting to evaluate, based on available data, the actual environmental conditions experienced during the TMI-2 accident. This information will be provided in testimony.
- (B) Final Safety Analysis Report, Three Mile Island - Unit 1, Sec. 7.
- (C) None.
- (D) TMI-2 accident condition evaluations are continuing.
- (E) See introductory comments.

Interrogatory No. 116

What was before TMI-2 and is now the length of time in an accident environment for which each such structure, system and component is qualified to remain operable? Explain fully any discrepancies and provide relevant documentation.

Response

- (A) The structures, systems and components which were qualified to remain operable are discussed in the TMI-1 FSAR. The length of time for which each component is qualified is unchanged from that described in the FSAR. See also Response to Interrogatory No. 112. A further response to this Interrogatory will be supplied when Licensee's response to Interrogatory No. 113 is completed.
- (B) Final Safety Analysis Report, Three Mile Island - Unit 1, Sec. 7.
- (C) None.
- (D) See introductory comments.
- (E) See introductory comments.

Interrogatory No. 117

To what extent did the actual accident conditions at TMI-2 exceed the past and/or present time periods for which each such structure, system or component is qualified to remain operable under accident conditions?

Response

See Response to Interrogatory No. 115.

Interrogatory No. 118

Describe in detail the method used to qualify each such safety structure, system and component as meeting GDC 4. Provide the relevant documentation.

Response

See Response to Interrogatory No. 113.

Interrogatory No. 119

Is each such structure, system and component qualified according to the criteria of IEEE-323-1974, as modified by Regulatory Guide 1.89?

Response

- (A) The structures, systems, and components are not qualified according to the criteria of IEEE-323, 1974 as modified by Regulatory Guide 1.89.
- (B) FSAR Section 7.
- (C) None.
- (D) See introductory comments.
- (E) See introductory comments.

Interrogatory No. 120

For each system, structure or component not qualified according to the criteria of IEEE-323-1974, as modified by Regulatory Guide 1.89, provide the criteria by which it was qualified.

Response

See Response to Interrogatory No. 114.

Interrogatory No. 121

List all the equipment within the containment and auxiliary buildings previously deemed to be qualified which failed, either wholly or partially, during or after the accident at TMI-2. Describe the way in which each such piece of equipment failed and the reason(s) for the failure. Describe any and all corrective measures proposed and/or implemented to prevent recurrence of any such failures.

Response

- (A) The TMI-2 FSAR lists the qualified equipment required to be operational following an accident. Equipment failures during the initial period following the accident are described in the GPU 34 day Sequence of Events (see Reference B.2 below). The Licensee is compiling a list of equipment which failed following the TMI-2 accident and the causes or suspected causes of failure. This information will be provided in testimony. Measures being taken to improve the capability of equipment to withstand adverse conditions will be described in a future revision to the Restart Report and/or in testimony.

- B) 1. Final Safety Analysis Report, Three Mile Island - Unit 2.
2. Preliminary Annotated Sequence of Events, March 28, 1979 (Latest Revision); Preliminary Annotated Sequence of Events, March 29, 1979 - April 30, 1979 (Latest Revision). (Sequences of Events prepared by Metropolitan Edison Co.).
- (C) None.
- (D) TMI-2 equipment evaluations are continuing.
- (E) See introductory comments.

Interrogatory No. 122

What is the Licensee's rationale for failing now to comply with Regulatory Guide 1.89, incorporating IEEE-323-1974, for TMI-1?

Response

- (A) TMI-1 meets the qualification requirements in effect at the time of licensing, which do not include all of the current requirements contained in Regulatory Guide 1.89. Updating all equipment to Regulatory Guide 1.89 is not required by NRC or necessary in the interest of public safety. For example, the qualification of protection system equipment

at TMI-1 included tests and analyses similar to those required by Regulatory Guide 1.89, incorporating IEEE-323-1974. The significant requirement of IEEE-323-1974 not addressed by the TMI-1 qualification program involves aging of the equipment being qualified. The existing programs at TMI-1 for surveillance, periodic testing, maintenance, and replacement detect those components that may degrade during their installed life due to the environmental conditions.

Applying the aging considerations of IEEE-323-1974, in addition to the qualification testing that has already been performed, would yield insignificant increases in the level of confidence that the subject equipment is qualified.

- (B)
1. Regulatory Guide 1.89.
  2. IEEE-323-1974.
  3. Final Safety Analysis Report, Three Mile Island - Unit 1.
  4. BAW-10003A, Rev. 4, "Qualification Testing of Protection System Instrumentation."

- (C) None.
- (D) See introductory comments.
- (E) See introductory comments.

Interrogatory No. 123

Is it the position of the Licensee that the methods and assumptions used during the licensing and review of TMI-1 to environmentally qualify safety-related systems, structures, and components (including environmental parameters, testing, and analysis methods, length of time for which equipment must remain functional, and identification of "safety-related" equipment) are adequate to fully comply with a) GDC 4 and b) Regulatory Guide 1.89?

Response

- (A) a) See Response to Interrogatory No. 113.  
b) See Response to Interrogatory No. 122.
- (B) None.
- (C) None.
- (D) See introductory comments.
- (E) See introductory comments.

Interrogatory No. 124

If the answer to question #123 is other than an unqualified "yes", state in what manner those methods and assumptions were deficient in any respect.

Response

See Response to Interrogatory No. 113 and Interrogatory No. 122.

Interrogatory No. 125

If the answer to question #123 is other than an unqualified "yes", state which of the short and/or long term measures recommended by the Staff will correct those deficiencies. Explain your answer fully.

Response

As indicated in Licensee's Response to Interrogatory No. 122, updating all equipment to Regulatory Guide 1.89 is not required by the NRC or necessary in the interest of public safety. To Licensee's knowledge, none of the short or long term measures recommended by the Staff would require updating of environmental qualifications for existing equipment.

Interrogatory No. 146

Identify all systems and components presently classified as non-safety-related which contributed to the cause of the TMI-2 accident, aggravated the accident or were called upon to attempt to mitigate the accident. Discuss their role in the accident sequence.

Response

- (A) The systems and components which contributed to, aggravated or mitigated the TMI-2 accidents are identified and discussed in the documents listed in part B below.
- (B) Preliminary Annotated Sequence of Events, March 28, 1979 (Latest Revision); Preliminary Annotated Sequence of Events, March 29, 1979 - April 30, 1979 (Latest Revision).

(Sequences of Events prepared by Metropolitan Edison Co.).

- (C) None.
- (D) See introductory comments.
- (E) See introductory comments.

Dated: February 21, 1980

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AFFIDAVIT OF ROBERT W. KEATEN

State of New Jersey  
County of Morris, ss:

ROBERT W. KEATEN, being duly sworn according to law, deposes and says that he is the Manager of Systems Engineering of General Public Utilities Service Corporation, that the information contained in Licensee's Responses to the following Interrogatories are true and correct to the best of his knowledge and belief: Union of Concerned Scientists' ("UCS") Interrogatories Nos. 38, 39, 48, 49, 113-25, and 146, filed by the UCS on January 4, 1980, and Licensee's Errata for Responses to UCS Interrogatories 6 and 46.

\_\_\_\_\_  
Robert W. Keaten  
Manager of Systems Engineering

Sworn to and subscribed  
before me this \_\_\_ day  
of February, 1980

\_\_\_\_\_  
Notary Public

My Commission Expires: \_\_\_\_\_