

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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USNRC

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD ^{84 FEB 21 P2:45}

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

TMIA'S RESPONSE TO LICENSEE'S SECOND SET OF
INTERROGATORIES AND REQUEST FOR PRODUCTION
OF DOCUMENTS

Three Mile Island Alert (TMIA) hereby submits its responses to General Public Utilities' (Licensee's) request for production of documents and interrogatories.

From the outset it is crucial to note and the Board is well aware that requests for technical assistance are before the Board and are necessary to insure fairness and discovery of the absolute truth in regard to the steam tube integrity.

Furthermore, the intervenor is severely hampered by the action of the licensee which serves to limit the response which intervenor can forward. For example on February 16, 1984 fifteen documents were delivered to TMIA and as late as February 17, 1984 another document was delivered. These documents are crucial and necessary for the development of TMIA's response, but due to lack of

qualified experts and the fashion in which the documents arrived TMIA's response is brief.¹

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1. (See TMIA Motion for Appointment of Special Panel, January 25, 1984) TMIA currently has a motion before the ASLB that requests a panel of experts be appointed that would insure a competent and expeditious evaluation of the safety of the steam tube repairs.

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Interrogatories:

II-1.a-1. For each "post repair and plant performing testing and analysis" which you have identified as inadequate in your response to Interrogatory 1.a-1 under Part I of this document, do you allege that such test or analysis was inadequate in its assessment of:

(a) The fatigue life of the TMI-1 steam generator tubes before kinetic expansion repairs were performed and/or after kinetic expansion repairs were performed;

(b) The stress levels on the TMI-1 steam generator tubes before kinetic expansion repairs were performed and/or after kinetic expansion repairs were performed;

(c) the effects of the corrosive contaminant on the stress levels on the TMI-1 steam generator tubes, and the fatigue life of TMI-1 steam generator tubes;

(d) the effects of changed strength and dimensions of tubes which have been kinetically expanded on the stress levels on the TMI-1 steam generator tubes and the fatigue life of the TMI-1 steam generators;

(e) The crack size, for purposes of determining the stress levels on the TMI-1 steam generator tubes, in particular the effects of thermal stress, and the fatigue life of TMI-1 steam generator tubes; and

(f) The crack location, for purposes of determining the stress levels on the TMI-1 steam generator tubes and the fatigue life of TMI-1 steam generator tubes?

Response:

At this time TMIA does not have access to the technical expertise which would allow TMIA to assess the adequacy of licensee's testing and analysis.

II-1.a-2. If your answer to any part of Interrogatory II-1.a-1 is other than an unqualified "no", state in detail each and every fact upon which you base your allegation that the particular test or analysis inadequately assesses the factors identified in that Interrogatory.

II-1.a-3. Explain in detail how each fact stated in your answer to Interrogatory II-1.a-2 supports your allegation that the test or analysis identified in your answer to Interrogatory II-1.a-1 is inadequate in the manner you allege.

II-1.a-4. Identify each and every document which you claim supports each fact set forth in your answers to Interrogatories II-1.a-1 through II-1.a-3 above, and correlate each such document as specifically as possible (page and paragraph number) with each such fact.

II-1.a-5. Do you allege that the use by Licensee of an axial load of 1110 pounds/100°F during the corrosion tests referred to in TR-008 was improper?

II-1.a-6. If your answer to Interrogatory II-1.a-5 above is other than an unqualified "no", explain why it was improper to use that axial load during the corrosion tests.

II-1.a-7. State in detail each and every fact upon which you base your allegations in your answer to Interrogatory II-1.a-6.

II-1.a-8. Explain in detail how each fact stated in your answer to Interrogatory II-1.a-7 supports your allegations in Interrogatory II-1.a-6.

II-1.a-9. Identify each and every document which you claim supports each fact set forth in your answer to Interrogatories II-1.a-5 through II-1.a-8 above, and correlate each such document as specifically as possible (page and paragraph number) with each such fact.

Response to II-1.a-2 through II-1.a-9:

At this time TMIA does not have access to the technical expertise which would allow TMIA to identify the inadequacies of Licensee's testing and analysis.

II-1.b-1. Explain how the alleged "history of affecting other primary pressure boundary materials" of the corrosion damage affects the likelihood of a simultaneous tube rupture in both steam generators.

II-1.b-2. State in detail each and every fact upon which you base your allegations in your response to Interrogatory II-1.b-1, and explain in detail how each such fact supports the allegation.

II-1.b-3. Identify each and every document which you claim supports each fact set forth in your answers to Interrogatories II-1.b-1 and II-1.b-2, and correlate each such document as specifically as possible (page and paragraph number) with each such fact.

Response to II-1.b-1 through II-1.b-3:

At this time TMIA does not have access to the technical expertise which would allow TMIA to identify how the history of affecting other primary pressure boundary materials of the corrosion damage will affect the likelihood of a simultaneous tube rupture in both steam generators.

II-1.b-4. Explain how the alleged "uniqueness and deforming character of the repair method used" affects the likelihood of a simultaneous tube rupture in both steam generators.

II-1.b-5. State in detail each and every fact upon which you base your allegations in your response to Interrogatory II-1.b-4, and explain in detail how each such fact supports your allegation.

II-1.b-6. Identify each and every document which you claim supports each fact set forth in your answers to Interrogatories II-1.b-4 and II-1.b-5, and correlate each such document as specifically as possible (page and paragraph number) with each such fact.

Response to II-1.b-4. through II-1.b-6:

Page 15 of TPR states: "The explosive expansion of the tubes could affect the stress levels if the process would change the strength or some dimension of the tubes." Since all of the tubes in both S.G's underwent the expansion repair process, there is a greater probability of simultaneous tube rupture at TMI-1.

II-1.b-7. Explain how the "large number of tubes which were repaired" affects the likelihood of a simultaneous tube rupture in both steam generators.

II-1.b-8. State in detail each and every fact upon which you base your allegations in your response to Interrogatory II-1.b-7, and explain in detail how each such fact supports your allegation.

II-1.b-9. Identify each and every document which you claim supports each fact set forth in your answers to Interrogatories II-1.b-7 and II-1.b-8, and correlate each such document as specifically as possible (page and paragraph number) with each such fact.

Response to II-1.b-7 through II-1.b-9:

See response to II-1.b-4 through II-1.b-6.

II-1.b-10. Explain your understanding of the Commission's May 5, 1983 response to Congressman Markey discussing the Shewmon Memorandum, and how that May 5, 1983 response affects your contention that the Shewmon Memorandum supports Contention 1.b.

Response: The Commission's May 5, 1983 response to Congressman Markey appears to assure Congressman Markey that a simultaneous tube rupture in both S.G's is unlikely. However these assurances are not supported with any data and in some instances contradict the position of the Staff in other documents, i.e. at page 2 the response relies on ECT as a method of early detection of leaks, but in a May 19, 1982 memorandum, the Staff indicates that ECT is unpredictable as a method of detecting and quantifying the type of corrosion found in TMI-1 OSTG.

II-1.b.11 Explain how Licensee's TDR-406 section 2.1.3.1 provides support for the possibility of simultaneous tube rupture in both steam generators.

Response: TDR-406 deals with technical guidelines for dealing with tube ruptures. Section 3.1.1 has a provision to deal with tube leaks in both OSTG's. The "Comments" at p.21 of the TDR indicate that operators who were being trained on the use of the revised guidelines found the training to be of "dubious value" and that B&W would not endorse the material.

II-1.b.12 State in detail each and every fact upon which you base your allegations in your response to Interrogatory II-1.b.11 and explain in detail how each fact supports your allegations.

Response: See response to interrogatory II-1.b.11.

II-1.b-13. Explain how the Third Party Review Group's February 16 report at page 4 supports Contention 1.b.

II-1.b-14. State in detail each and every fact upon which you base your allegations in your response to Interrogatory II-1.b-13, and explain in detail how each such fact supports your allegations.

Response to II- 1.b-13 and II-1.b-14:

Page 4 of the TPR indicates that to ensure the safety of the plant it is necessary to complete an analysis of the contingency of multiple tube rupture and to translate that analysis into useable plant guidance, procedures and training. However the "Comments" at page 21 of TDR-406 indicate that the information has not been translated into useable plant guidance.

II-1.b-15. Explain how SECY-82-72 dated February 18, 1982, pages 2 to 3, supports Contention 1.b.

II-1.b-16. State in detail each and every fact upon which you base your allegations in response to Interrogatory II-1.b-15, and explain in detail how each such fact supports your allegation.

II-1.b-17. Identify each and every document which you claim supports each fact set forth in your answers to

Response: SECY-82-72 discusses the overall steam generator problem and points out a concern with simultaneous steam generator rupture. Page 2 of the document in particular, discusses the continuing loss of core cooling ability and the significant challenge to plant operators and safety systems.

II-1.c-1. Do you allege that the kinetic expansion repair weakened the tubes such that plugs will not be able to hold and give a good seal?

II-1.c-2. If the answer to the preceding Interrogatory is other than an unqualified "no":

(a) Identify each type of plug which you allege will not be able to hold and give a good seal;

(b) State in detail each and every fact upon which you base your allegation that each such type of plug will not be able to hold and give a good seal; and

(c) Explain in detail how each fact stated in your answer to (b) above supports your allegation that each such type of plug will not be able to hold and give a good seal.

II-1.c-3. Identify each and every document which you claim supports each fact set forth in your answers to Interrogatories II-1.c-1 and II-1.c-2 above, and correlate each such document as specifically as possible (page and paragraph number) with each such fact.

II-1.c-4. Define and explain the extent to which you allege a plug must be able to "hold."

II-1.c-5. Define and explain the extent to which you allege a plug must be able to "give a good seal." Include in your answer your definition of a "good seal."

II-1.c-6. Provide the factual, legal, and regulatory basis for your responses to Interrogatories II-1.c-4 and II-1.c-5 above.

II-1.c-7. Identify each and every document which you claim supports each fact set forth in your answers to Interrogatories II-1.c-4 through II-1.c-6 above, and correlate each such document as specifically as possible (page and paragraph number) with each such fact.

Response to II-1.c-1 through II-1.c-7:

At this time TMIA does not have access to the technical expertise which would allow TMIA to recognise the degree to which the expanded tubes have lost their plug holding capability.

II-1.d-1. What do you mean by "any independent analysis" which you allege appears not to have been done by either the Third Party Review Group or the NRC Staff?

Response: Independant analysis means in this instance analysis other than that performed by GPU or its consultants. Both the SER and the TPR rely on GPU testing and analysis in reaching their conclusions.

II-1.d-2. If no independent analyses (as defined in your answer to Interrogatory II-1.d-1) was performed by either the Third Party Review Group or the NRC Staff, do you allege that this fact renders the "Report of Third Party Review of Three Mile Island, Unit 1, Steam Generator Repair ("TPR") or the Staff's Safety Evaluation Report ("SER") incredible documents in their evaluation of "the kinetic expansion repair technique including leak tightness and load carrying capabilities"?

Response to II-1.d-2:

Yes.

II-1.d-3. Explain how each of the alleged inconsistencies identified in your response to Interrogatory 1.d-3 in response to the first set of interrogatories and in response to Interrogatory 1.d-3 in Part I above undermines or is inconsistent with the evaluation in the TPR and SER of the "kinetic expansion repair technique, including leak tightness and load carrying capabilities".

Response to II-1.d-3:

See response to II-1.d-1.

II-1.d-4. Identify each and every document which you claim supports each fact set forth in your answers to Interrogatories II-1.d-1 through II-1.d-3 above, and correlate each such document as specifically as possible (page and paragraph number) with each such fact.

Response to II-1.d-4:

See response to II-1.d-1.

II-1.d-7. Do you claim that Licensee should have performed the "Rockwell Hardness Tests" on any corroded tubes:

- (a) before the expansion repair; and
- (b) after the expansion repair.

II-1.d-8. If your answer to Interrogatory II-1.d-7 is other than an unqualified "no", state in detail each and every fact upon which you base such allegation, and explain in detail how each such fact supports the allegation.

Response to II-1.d-7 through II-1.d-8:

At this time TMIA does not have access to the technical expertise which would allow TMIA to assess the value of one test for hardness as opposed to another.

II-1.d-9. Identify where in TPR you allege that the Third Party Review Group "seems to reject the axial symmetric assumption analyzing stresses in the transition zone", and explain why you think the allegation to be true.

II-1.d-10. Identify each and every document which you claim supports each fact set forth in your answers to Interrogatories II-1.d.5 through II-1.d.-9 above, and correlate

Response:

The following statement appears at page 17 of the TPR "...in the free span the relevant stresses are axisymmetric and tensile throughout the wall however in the expansion transition zone of the tube, in the vicinity where the expanded tube diameter changes to the nominal diameter, two additional stress states are superimposed on the axial tensile stresses."

II-1.d-11. Do you allege that the fact that post repair testing assumptions are based on a cool-down failure mode

(a) has any relevance to the alleged "failure to analyze crack resistance on the basis of toughness as opposed to hardness"; and

(b) undermines Licensee's analysis of crack resistance?

II-1.d-12. If your answer to Interrogatory II-1.d-11(b) is other than an unqualified "no", state in detail each and every fact upon which you base your allegation, and explain how each such fact supports those allegations.

II-1.d-13. Identify each and every document which you claim supports each fact set forth in your answers to Interrogatories II-1.d-11 and II-1.d-12, and correlate each such document as specifically as possible (page and paragraph number) with each such fact.

Response:

At this time TMIA does not have access to the technical expertise which would allow TMIA to determine the adequacy of Licensee's testing assumptions.

II-1.d-14. Do you allege that the fact that the post repair testing assumptions are based on a cool-down failure mode

(a) has any relevance to the alleged failure to differentiate the effect of thermal stress on small versus large cracks; and

(b) undermines Licensee's analysis of thermal stress?

II-1.d-15. If your answer to Interrogatory II-1.d-14(b) is other than an unqualified "no", state in detail each and every fact upon which you base your allegation, and explain how each such fact supports that allegation.

II-1.d-16. Identify each and every document which you claim supports each fact set forth in your answers to Interrogatories II-1.d-14 and II-1.d-15, and correlate each such document as specifically as possible (page and paragraph number) with each such fact.

Response:

See response to interrogatories II-1.d-11 through II-1d-13.

II-2.a-1. How does the Staff's statement at pages 7 and 8 of the SER that "the sodium thiosulfate concentration of 4 to 5 ppm is the contaminant which 'most likely' caused the OTSG degradation" support your allegations that:

(a) the "causative agent" has not been properly identified;

(b) that the "source of initiation" has not been properly identified; and

(c) that "the conditions under which initiation of the IGSCC originally occurred" have not been properly identified?

II-2.a-2. State in detail each and every fact upon which you base your allegations in your answer to Interrogatory II-2.a.-1 above, and explain in detail how each fact supports your allegations.

Response: The Staff's statement is inconclusive, if the contaminant cannot be identified conclusively then there can be no assurance that the source of initiation has been properly identified, or that

the conditions under which initiation of the IGSCC originally occurred have been properly identified.

II-2.a-3. Explain how the statement by the NRC Staff at page 8 of the SER that the failure scenario has not been clearly established supports your allegations that:

- (a) the "causative agent" has not been properly identified;
- (b) the "source of initiation" has not been properly identified; and
- (c) the "conditions under which initiation of the IGSCC originally occurred" have not been properly identified.

II-2.a-4. State in detail each and every fact upon which you base the allegations in your answer to Interrogatory II-2.a-3, and explain in detail how each fact supports your allegations.

Response:

See response to II-2.a-1 and II-2.a-2.

II-2.a-5. Explain how the "three previous contaminations which may have caused corrosion" recognized at page 8 of the SER supports your allegations that:

- (a) the "causative agent" has not been properly identified;
- (b) that the "source of initiation" has not been properly identified; and
- (c) that the "conditions under which the initiation of the IGSCC originally occurred" have not been properly identified.

II-2.a-6. State in detail each and every fact upon which you base your allegations in your answer to Interrogatory II-2.a-5, and explain in detail how each fact stated in your answer supports your allegations.

Response to II-2.a-5 and II-2.a-6:

See response to II-2.a-1 and II-2.a-2.

II-2.a-7. Explain how Mr. Dillon's comment at page 12 of his report regarding "inconsistencies in the cracking environment" which "certainly invite questions", his concerns about contradictions regarding the cracking solution chemistry, and his suggestion that a corrosion test be conducted in a cold high oxygen and high concentrate sulfate environment support your allegations that:

(a) the "causative agent" has not been properly identified;

(b) the "source of initiation" has not been properly identified; and

(c) the "conditions under which initiation of the IGSCC originally occurred" have not been properly identified.

II-2.a-8. State in detail each and every fact upon which you base your allegations in your answer to Interrogatory II-2.a-7, and explain in detail how each fact stated in your answer supports your allegations.

II-2.a-9. Explain how Mr. McDonald's comments at pages 18 through 24 of his report discussing the possible role of a polysulfur species, observation of the sulfur deposits of an unknown form in the system, and the possible introduction of thiosulfate in the system sometime earlier than September 1981 support your allegations that:

(a) the "causative agent" has not been properly identified;

(b) the "source of initiation" has not been properly identified; and

(c) the "conditions under which initiation of the IGSCC originally occurred" have not been properly identified.

Response to II-2.a-7 through II-2.a-9:

Both Mr. Dillon and Mr. McDonald's expressed uncertainties regarding identification of the contaminant and the method of introduction into the steam generator, support the contentions.

II-2.a-10. State in detail each and every fact upon which you base your allegations in your answer to Interrogatory II-2.a-9, and explain in detail how each fact stated in your answer supports your allegations.

II-2.a-11. Identify each and every document which you claim supports each fact set forth in your answers to Interrogatories II-2.a-1 through II-2.a-10, and correlate each such document as specifically as possible (page and paragraph number) with each such fact.

Response:

See response to interrogatories II-2.a-7 through II-2.a-9.

II-2.a-12. Do you allege that the failure to definitively establish which form of sulfur causes the IGSCC in the TMI-1 OTSG would undermine "the reliability of any proposed clean-up process, procedures meant to eliminate corrosive environment, or the reliability of the Licensee and Staff stress analysis as to when corrosion would reoccur?"

II-2.a-13. If your answer to Interrogatory II-2.a-12 is other than an unqualified "no", state in detail each and every fact upon which you base your allegations, and explain in detail how each fact stated in your answer supports your allegations.

Response:

Yes. See response to interrogatories II-2.a-7 through II-2.a-9.

II-2.a-14. Do you allege that the cracking of the TMI-1 OTSG did not occur during cool-down?

Response:

TMIA contends that because of the uncertainty regarding the contaminant and the Staff's uncertainty regarding the failure scenario it is possible that the cracking did not occur during cool-down.

II-2.a-15. If your answer to Interrogatory II-2.a-14 is other than an unqualified "no", explain in detail each and every fact upon which you base your allegation and explain how each such fact supports your allegation.

II-2.a-16. Identify each and every document which you claim supports each fact set forth in your answers to Interrogatories II-2.a-12 through II-2.c-15, and correlate each such document as specifically as possible (page and paragraph number) with each such fact.

Response:

See response to II-2.a-14.

II-2.b.2-1. Do you claim that the estimate of 20 to 50% sulfur remaining in the TMI-1 OTSG fails to take into account that piping and components of less than one inch in diameter were not flushed during the cleaning process?

II-2.b.2-2. If your answer to Interrogatory II-2.b.2-1 is other than an unqualified "no", explain in detail each and every fact upon which you base this allegation.

II-2.b.2-3. Do you allege that the failure to flush piping and components of less than one inch in diameter significantly increases the likelihood of corrosion?

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II-2.b.2-4. If your answer to Interrogatory II-2.b.2-3 is other than an unqualified "no", state in detail each and every fact upon which you base your allegation, and explain in detail how each fact stated in your answers supports the allegation.

II-2.b.2-5. Identify each and every document which you claim supports each fact set forth in your answers to

Response:

The estimate of 20 to 50% sulfur remaining in OSTG appeared in the SER before the Staff was aware that piping of less than one inch in diameter were not flushed during the cleaning process, therefor TMIA assumes that the 20 to 50% fails to take into account piping and components of less than one inch in diameter.

Respectfully submitted,

By: Louise Bradford
Louise Bradford
Joanne Doroshow
TMIA

Dated: February 17, 1984

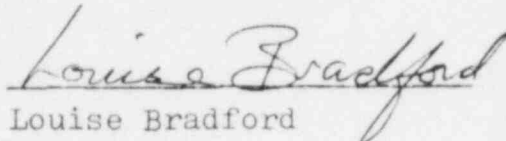
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	}	Docket No. 50-289-OLA
METROPOLITAN EDISON COMPANY, <u>ET AL.</u>	}	ASLBP 83-491-04-)LA
(Three Mile Island Nuclear	}	(Steam Generator Repair)
Station, Unit No.1)	}	

CERTIFICATE OF SERVICE

I hereby certify that copies of TMIA'S RESPONSE TO LICENSEE'S
SECOND SET OF INTERROGATORIES AND REQUEST FOR PRODUCTION OF
DOCUMENTS were served this 18th day of February, 1984.


Louise Bradford

Dated: February 18, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)	
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METROPOLITAN EDISON COMPANY, <u>ET AL.</u>)	Docket No. 50-289-OLA
)	ASLBP 83-491-04-OLA
(Three Mile Island Nuclear)	(Steam Generator Repair)
Station, Unit No. 1))	

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