

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)

METROPOLITAN EDISON COMPANY, ET AL.)

(Three Mile Island Nuclear
Generating Station, Unit 1))

Docket 50-289 '84 JAN 18 A10:42
(Steam Generator Repair)

DOCKETED
USNPC
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LEE ET AL. INTERROGATORIES OF LICENSEE (SET 1)

1. What is the composition of the tubes in the steam generators at TMI (1) (hereafter referred to as "tubes")?
 - a) Give range of content of each element.
 - b) Give range of content of each sulphur compound.
2. What contaminants were present in tube material "as received"?
3. What is the range of the content of the contaminants described in answer to 1(2)2?
4. What precipitates were found within or on the flanks of tube cracks generated in the plant?
5. What precipitates were found within or on the flanks of cracks generated in laboratory tests?
6. Give composition of tubes of 1(2)4.
7. Regarding samples of 1(2)5
 - provide composition of samples
 - provide sample preparation method(s), including heat treatment
 - provide test description, including test environment
 - provide method whereby crack composition was evaluated
 - provide all test procedures
 - provide all test data
8. Describe in full the mechanism(s) licensee relies upon to describe IGSCC generation in the tubes of the OTSG.
9. Describe all programs conducted by or for licensee to determine whether agents other than sulfur contributed to IGSCC.
10. Provide all results obtained from the programs described in answer to 9.
11. Describe all programs conducted by or for licensee to determine whether agents other than sulfur caused IGSCC.
12. Provide all results obtained from the programs described in answer to 11.
13. What significance does licensee place on IGA islands remote from expansion area?
14. What progression of morphological change does licensee rely upon to describe IGA islands over the projected life of the OTSG's?

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15. Provide list of all elements, compounds, and other contaminants and their concentrations which could be expected to be found in the water passing through the tubes of the OTSG's over their expected lifetime.

In the following questions, reference is made to Report of the Third Party Review of Three Mile Island, Unit 1, Steam Generator Repair, Supplement 1, May 16, 1983.

16.
 - a. Has Licensee obtained a Total Organic Carbon (TOC) analyzer?
 - b. If not, when does Licensee expect to obtain one?
 - c. Has Licensee in its employ personnel who are trained to use and/or interpret the data obtained from a TOC?
 - d. Identify these personnel.
 - e. Describe the technical specifications of Licensee's TOC, if existent, relative to PPM. (See page 3, "Further Comment 3".)
17. Has Licensee determined the nominal or "background" sodium as recommended at page 4, "Further Comment 6".
18.
 - a. As discussed at page 4, "C. Materials Application, Comment 1", have any small cracks, not detected at the time of the repair of the tubes been detected since that time?
 - b. Have any further inspections been conducted since the repairs until the present time?
 - c. If so, provide the results of these inspections (and dates), — names of GPU or contractor personnel who made the inspections.
19. Concerning the recommendation at page 5 "Comments 2 and 3", what plans has Licensee made and/or implemented to make corrosion tests?
20. Provide Licensee's assessment of the effectiveness of removal of sulfur from steam generators.
21. Has Licensee observed any harm to the plant, in any way, shape or form, as a result of the flushing of the plant? If so, describe observations with specificity including dates and personnel involved.
22. Relative to page 5 "Comment 4 and Recommendation 1", last para., provide the opinions of other experts, including the identity of these experts, known to Licensee, concerning the desirability or necessity for sulfur removal to be completed.
23. Provide the analysis of the cause of the anomalous data from the beaker test which would allow data to be set aside. (Ref. page 6, first para.)
24. How does Licensee explain the uncertainty concerning percentage of residual sulfur, estimated between 20 and 50% at page 6?
25.
 - a. How will Licensee manage the "complicated process" of control of sulfur residues?
 - b. What Licensee personnel have been assigned to this function?
 - c. Provide identity and qualifications of these personnel.
 - d. Provide job assignment of these personnel if primary assignment is other than sulfur control and percent of job time estimated to be assigned to sulfur control.

26. What "upsets" in the chemical control of sulfur residue have been identified as possible and defined by the third party review committee, its members individually, or other experts?
27. Provide the procedure which will address the sampling of the process control of peroxide flush based on the skeletal proposal of Table B-1, TR-010. (See page 6, Further Comment 1, Report, May 16, 1983)
27. Has Licensee evaluated the potential for chloride throw from the sulfate removal resin? If so, provide evaluations. If not, why not? (See page 7, para. one)
28. Provide any documentation and/or information, verbal or written, that addresses the issue of agents other than sulfur as being the cause or a potential contributing factor towards corrosion in the steam generator tubes.
29. Provide any documentation and/or information, verbal or written, concerning the action of synergists in the chemical and/or metallurgical processes leading to IGA of nickel base austenitic and/or other alloys.
30. Describe all studies conducted ^{or by} for Licensee to evaluate the effect of the following parameters on intergranular crack initiation and/or growth:
 1. Carbon content of alloy
 2. Titanium content of alloy
 3. Sulfur content of alloy
 4. Water temperature
 5. PH of water
 6. Boron content of water
 7. Radionuclide content of water
 8. Sodium content of water
 9. Chlorine content of water
31. Describe all studies conducted by or for Licensee to evaluate the inter-relationships of the effects of the parameters listed in (18) on intergranular crack initiation and growth.
32. Provide all documents generated by or for Licensee or relied upon by Licensee in the studies (both laboratory and literature-based) described in response to questions (30) and (31).
33. Describe all cases of intergranular attack observed in plant piping and the tubes of the steam generators prior to 1982.
34. For each case described in your answer to Question 33, provide the following data:
 - a. Description of morphological changes noted, including depth and circumferential arc of any cracks
 - b. Analysis of pipe or tube alloy
 - c. Analysis of water (estimated if measurements were not made) which contacted these pipes and tubes over their lifetime prior to observed morphological changes
35. For each case described in your answer to Question 33, describe the mechanism upon which Licensee relied to describe the cause of

morphological change.

36. Provide all information concerning the repair process used in repair of the steam generator tubes. Include all proprietary information, chemicals used and their intended function, the flushing process, and all other processes.
37. Provide all information concerning problems encountered with the repair process, including all verbal and written communications between any or all of the following: Licensee personnel, contractor personnel, Licensee experts/consultants, NRC Staff, Third Party Review Group or any of its members, NRC Staff experts/consultants, Babcock and Wilcox personnel or consultants.
38. Describe, in full, Licensee's administrative program for the detection of breaks in the steam generator tubes.
39. Describe any past relationship(s) between Licensee and any member of the Third Party Review Group.
40. Did Licensee provide or promise any remuneration of any kind to any member of the Third Party Review Group?
41. Did Licensee participate in the NRC Staff's selection of the members of the Third Party Review Group?

The following questions pertain to NRC Inspection Report 50-289/83-26

42. Concerning the release of Krypton gas on August 29, 1983, was the tracer gas being used to test the integrity of the steam generator tubes?
43. Has Licensee determined whether any gas was released because of a failure, or multiple failures, in the tube(s)?
44. Describe the identified paths of leakage.
45. At any time during the review of this event by Licensee management or plant personnel was it believed that there was any release of Krypton through the steam generator tube(s)?
(a) If so, by whom?
46. In Plant Incident Report (PIR) No. 1-83-14, there was uncertainty concerning the path of leakage which was resolved in a revision (Revision 1) to this report. Explain the uncertainty, how it was resolved, and provide the identity of all the persons involved.
47. Were any inspections, repairs, or adjustments made to the steam generator tubes between 3:30 p.m. on August 29, 1983, and August 30, 1983? If there were any such inspections, repairs, or adjustments, describe them.

Referring to ACRS Meeting of January 28, 1983, provide answers to the following questions:

48. Explain Licensee's identified inadequacy of present emergency action levels re condition of steam tubes as discussed at page 211.
49. Explain how the emergency use of the condensate storage tank at TMI-2 in the event of steam tube rupture at TMI-1 (as discussed at page 199) is consistent with the separation of waste handling of Units 1 and 2.
50. Describe staffing that Licensee has committed to monitoring of leak rates from steam generator tubes (see page 214).
51. Provide the procedures which administer the monitoring of leak rates from steam generator tubes (See page 214).
52. Provide the ATOG procedures that have been modified or created to deal with the steam generator tube problem.
53. Provide documentation concerning proposed change of 20 degrees in subcooling temperature as discussed at page 222.
54. Provide GPU Nuclear presentations made at April 12 and 13, 1983 meetings with Third Party Review Group.

Pursuant to 10 C.F.R. 2.740b and 2.741, the joint intervenors, Lee et al., hereby request that Licensee answer separately and fully in writing, and under oath, each of the above interrogatories. These interrogatories are intended to be continuing in nature, and the answers should be promptly supplemented or amended as appropriate, pursuant to 10 C.F.R. 2.740(e), should Licensee or any one acting on their behalf obtain any new or differing information responsive to these interrogatories. Licensee is to respond according to the same standards described in Licensee's First Set of Interrogatories and Request for Production of Documents to Joint Intervenors, December 15, 1983 at pages 2 through 4. and 15 through 16.

Respectfully submitted,

Jane Lee

Jane Lee

Norman O. Asmott

Norman O. Asmott

January 16, 1984

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CERTIFICATE OF SERVICE

I hereby certify that copies of

LEE ET AL. RESPONSES TO STAFF INTERROGATORIES (12/23/83)

LEE ET AL. RESPONSES TO LICENSEE'S FIRST SET OF INTERROGATORIES

LEE ET AL. INTERROGATORIES OF NRC STAFF (Set 1)

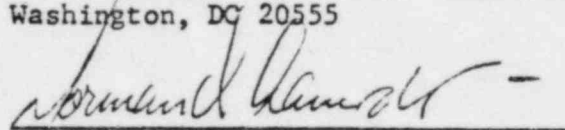
LEE ET AL. INTERROGATORIES OF LICENSEE (Set 1)

in the above-captioned proceeding have been served on the following by
deposit in the United States mail, first class, this 16th day of January 1984.

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