

JUN 14 1984

MS 016

MEMORANDUM FOR: Richard Vollmer, Director  
 Division of Engineering

FROM: Darrell G. Eisenhut, Director  
 Division of Licensing

SUBJECT: FORT CALHOUN STEAM GENERATOR TUBE FAILURE

DISTRIBUTION:  
 Docket File ETourigny  
 NRC PDR PKreutzer  
 Local PDR GCLainas  
 ORB#3 Rdg & Memo  
 DEisenhut

By letter dated June 5, 1984, NRC Region IV issued a Confirmatory Action Letter to the Omaha Public Power District (Enclosure 1). The letter delineated our requirements for plant restart. The purpose of this memorandum is to request your assistance in reviewing the licensee's submittals and information presented in meetings.

Enclosure 2 contains the next major milestones as we see them. The licensee is presently preparing his safety analysis. We estimate that the licensee will have the safety analysis completed by June 12, 1984. We estimate that the licensee will present his safety analysis to us in Bethesda on June 13, 1984. In that meeting, we should be prepared to give the licensee verbal authorization to restart the plant. If we believe that additional conditions are necessary, we can advise the licensee at that time. Based upon the meeting in Bethesda and the information presented in the licensee's May 31, 1984 submittal (Enclosure 3), I propose that you provide me a safety evaluation covering your assigned areas within five working days after the meeting. We estimate the date to be June 20, 1984. While you are writing your safety evaluation, the licensee will perform the hydro test and report the results. We estimate this date to be June 18, 1984. The licensee's final report on the failure analysis will be submitted by June 30, 1984. I propose that your safety evaluation addressing this report be completed by July 31, 1984. I would like to be advised if these schedules pose a problem; most of the dates are estimates at this time and may change.

As you know, a task interface agreement (TIA) is being circulated for concurrence. A draft copy is enclosed (Enclosure 4). The above milestones are generally consistent with the TIA. I have not scheduled any independent failure analyses of the failed tube at this time. We are still discussing with the licensee the possibility of obtaining a sample.

Original signed by  
 Darrell G. Eisenhut

Darrell G. Eisenhut, Director  
 Division of Licensing

Enclosures:  
 As stated

ORB#3:DL  
 PKreutzer  
 6/8/84

ORB#3:DL  
 JRMiller  
 6/8/84

AD:OR/DL  
 GCLainas  
 6/11/84

D:DL  
 REisenhut  
 6/12/84

8406220047 840614  
 PDR ADOCK 05000285  
 G PDR

In Reply Refer To:  
Docket: 50-285

(MAILED 6/5/85)

Omaha Public Power District  
ATTN: W. C. Jones, Division Manager  
Production Operations  
1623 Harney Street  
Omaha, Nebraska 68102

Gentlemen:

Following the failure of a steam generator tube during hydrostatic testing on May 16, 1984, at the Fort Calhoun Station, a series of discussions were held with the NRC staff regarding steam generator tube examinations and conditions for restart of the plant. At a meeting on May 29, 1984, with the NRC staff, the District presented the available information, outlined the District's commitments, and set forth the plans for return to power operation. The information presented at the May 29, 1984, meeting was subsequently documented in the District's letter (LIC-84-160), dated May 31, 1984, to the NRC Region IV. A similar letter (LIC-84-159), dated May 31, 1984, was also sent to NRR.

We have reviewed your letters of May 31, 1984, and have further considered the proposed conditions and circumstances for return to power operation. On June 1, 1984, a meeting was held between Messrs. Miller, Jones, and Andrews of Omaha Public Power District (OPPD) and Messrs. Collins, Denise, Johnson, Tomlinson, and Miller of the NRC staff. At that meeting, we advised you that the program outlined in the OPPD letters of May 31, 1984, required some modification and augmentation to be acceptable to the NRC staff. The purpose of this letter is to confirm those actions and conditions required of OPPD as set forth by the NRC staff at the June 1, 1984, meeting. These requirements and conditions are:

1. OPPD will perform eddy current testing of all tubes in steam generators A and B which are accessible with the remote probe insertion machine.

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

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2. OPPD will complete evaluation, with independent verification, of the results of the eddy current testing, including the profilometry testing of steam generator tubes performed during the current outage.
3. OPPD will prepare a safety evaluation covering the tube failure event and subsequent evaluations of tube integrity. The safety evaluation should identify the failure cause, provide an evaluation of current data and trends, set forth the basis for any conclusion that the tube failure of May 16, 1984, is an isolated event, and establish why it is safe to return the Fort Calhoun Station to power operation until the next scheduled outage.
4. OPPD will maintain the Fort Calhoun Station in the present condition (Mode 5) until after NRC approval. The primary augmentation in our direction compared to your proposal relates to the number of tubes to be tested, a possible meeting with the NRC staff to discuss results, and keeping the plant in Mode 5 until after that meeting.

Other conditions and commitments set forth in your letters of May 31, 1984, remain in effect. Areas include review of tube rupture emergency procedures to reconfirm adequacy, refresher training of licensed personnel in the emergency procedure, interim leakage restrictions, and internal frequency of sampling for detection of leakage. Regarding a meeting between OPPD and NRC, if necessary, OPPD should be prepared to specify the internal sampling frequency. In addition, OPPD should be prepared to describe in detail the expected sensitivity of leak detection using boron as the identifier, and should set forth the leakage detection capabilities using radioactive species as a function of time after restart.

We recognize that OPPD has already devoted a significant amount of effort in pursuit of resolution in this matter, has performed a large amount of examination and evaluations, and has made commitments to continue to give close attention to steam generator tubes. We appreciate OPPD's continuing commitment to safe operation of the Fort Calhoun Station.

Omaha Public Power District

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If you have any questions related to the NRC requirements, please contact the NRC Project Manager, Mr. E. Tourigny at (301)492-7110.

Sincerely,

SIGNED BY JOHN T. COLLINS

John T. Collins  
Regional Administrator

cc:

W. G. Gates, Manager  
Fort Calhoun Station  
P.O. Box 399  
Fort Calhoun, Nebraska 68023

Harry H. Voight, Esq.  
LeBoeuf, Lamb, Leiby & MacRae  
1333 New Hampshire Avenue, NW  
Washington, DC 30036

Fort Calhoun Station Restart Milestones

- Licensee's Safety Analysis (6/12/84 - Best Estimate)
  - S.G. Tube Inspections and Results
  - S.G. Failed Tube Failure Analysis and Results
  - SGTR EP Review and Results
  - SGTR Operator Training Refresher and Results
  - 0.3 gpm Interim Leak Rate Implementation
  - Leakage Analysis Upgrade Program Implementation
  - Conclusions
  
- Licensee/NRC Staff Meeting In Bethesda (6/13/84 - Best Estimate)
  - Licensee to Present Safety Analysis
  - Licensee to be given Restart Approval  
(Additional NRC Conditions to be  
Imposed as Necessary)
  - Licensee to Document Meeting
  
- Staff's Safety Evaluation Based Upon Information  
Presented by licensee in Meeting and in May 31, 1984  
Submittal (6/20/84 - Best Estimate)
  - S.G. Tube Inspections and Results (MTEB lead)
  - S.G. Failed Tube Failure Analysis and Results  
(MTEB lead)
  - SGTR E.P. Review and Results (Region IV/Resident  
Inspector lead)
  - SGTR Operator Training Refresher and Results  
(Region IV/Resident Inspector lead)
  - 0.3 gpm interim leak rate implementation (Region  
IV/Resident Inspector lead)
  - Leakage analysis upgrade program implementation  
(Region IV/Resident Inspector lead)
  
- Licensee's Hydro Test (6/18/84 - Best Estimate)
  - Licensee to advise staff on results verbally
  - Licensee to advise staff on results in writing
  
- Licensee's Final Report on S.G. Failed Tube Analysis  
Results (Before or on June 30, 1984)
  
- Staff's Safety Evaluation of Licensee's Final Failure  
Analysis Report (MTEB lead) (July 31, 1984)

**Omaha Public Power District**  
1623 Harney Omaha, Nebraska 68102  
402/536-4000

May 31, 1984  
LIC-84-159

Mr. James R. Miller, Chief  
U. S. Nuclear Regulatory Commission  
Office of Nuclear Reactor Regulation  
Division of Licensing  
Operating Reactors Branch No. 3  
Washington, D.C. 20555

Reference: Docket No. 50-285

Dear Mr. Miller:

Steam Generator Tube Incident

The purpose of this letter and the attachments is to document information, commitments, and plans which were presented to the Commission during a meeting on May 29, 1984 concerning the Fort Calhoun Station's steam generator tube failure incident and inspections.

Attachment 1 contains information relating to selected plant parameters and plant status immediately prior to, during, and following a "B" steam generator tube incident on May 16, 1984.

Attachment 2 contains information relating to the steam generator tube inspections for the Fort Calhoun Station's steam generators. Data is provided for the inspection history of the steam generators, including the inspections performed during the 1984 refueling outage.

Attachment 3 contains information relating to the results of laboratory examinations performed on the section of the failed tube removed from "B" steam generator.

The above referenced Attachments 2 and 3 document a very comprehensive and thorough inspection and examination program which has been and is being conducted in order to establish a high level of confidence that the Fort Calhoun Station can be safely returned to service.

As discussed during the May 29, 1984 meeting, the District's current plans are as follows:

- (1) Complete the inspection of approximately 300 tubes in "B" steam generator using the 1 x 8 and/or the 4 x 4 pancake array probes.

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LIC-84-159  
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- (2) Analyze the data from the 1 x 8 and/or 4 x 4 probes inspection.
- (3) Complete the examination of at least 3000 tubes in the hot leg side of "B" steam generator using the bobbin coil probes. (Subsequent to the May 29, 1984 meeting, the District has committed to completing the examination of all accessible hot leg side tubes in "B" steam generator using the bobbin coil probes.)
- (4) Complete the analysis of the data from the bobbin coil probes testing referenced in item (3).
- (5) Complete the re-review of the data from "A" and "B" steam generator tube inspections conducted in March, 1984.
- (6) Continue laboratory examinations of the removed section of the "B" steam generator tube. The final report of these examinations will be submitted by June 30, 1984.

In the absence of any indication of significant flaws resulting from items (1) and (2) above, the District will begin reactor coolant system heatup in preparation for a reactor coolant system leak test at approximately 2200 psig. The reactor coolant system will be heated to a temperature of approximately 400°F for the test. After the satisfactory completion of the leak test, plant startup will continue. After items (4) and (5) are completed and in the absence of any indications of significant flaws, the plant will be returned to power operation. In the event any indications of significant flaws are identified, your office will be notified and a re-evaluation of the District's plans will be conducted.

Prior to returning the plant to power operation, the steam generator tube rupture emergency procedure will be reviewed to re-confirm adequacy and licensed operating personnel will receive refresher training on this emergency procedure. This review and training will assure that operating personnel maintain a high level of proficiency on emergency procedures, as demonstrated during the May 16, 1984 steam generator tube incident.


The Fort Calhoun Station operating manual will be revised to reflect an interim primary-to-secondary leakage through the steam generator tubes of 0.3 gpm total for both steam generators, as opposed to the existing Technical Specification limit of 1.0 gpm. If this leakage limit is exceeded, the action required by Technical Specification 2.1.4, paragraph (3), will be followed. This

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interim limit will serve to initiate corrective measures in a more timely manner in the unlikely event of additional steam generator tube leaks. In addition, the frequency of secondary side chemistry analyses related to detection of primary-to-secondary system leakage will be increased.

Upon completion of the items discussed above, the District will have taken reasonable and practical action to assure the continued safe operation of the Fort Calhoun Station and will have more than satisfied the station's Technical Specification and License requirements.

Sincerely,

  
W. C. Jones  
Division Manager  
Production Operations

WCJ/KJM:jmm

Attachments

cc: LeBoeuf, Lamb, Leiby & MacRae  
1333 New Hampshire Avenue, N.W.  
Washington, D.C. 20036

Mr. E. G. Tourigny, Project Manager  
Mr. L. A. Yandell, Senior Resident  
Inspector