



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

TERA

June 11, 1980

Docket No. 50-219

Mr. I. R. Finfrock, Jr.
Vice President - Generation
Jersey Central Power & Light Company
Madison Avenue at Punch Bowl Road
Morristown, New Jersey 07960

Dear Mr. Finfrock:

On December 28, 1979, the NRC Office of Inspection and Enforcement issued Information Notice No. 79.37 that discussed the discovery of cracks in the keyway and bore sections of discs in Westinghouse low-pressure turbines. A copy of this Information Notice with an errata sheet is enclosed. Subsequently, all licensees/users of low-pressure turbines manufactured by General Electric were invited to meet with the NRC staff and representatives of the vendor on January 9, 1980, to discuss the probability of disc cracking in these turbines. A summary of this meeting and the General Electric Company's presentation are also enclosed with this letter.

At the time of the January 9 meeting, General Electric did not have any recent results of ultrasonic inspections of its low-pressure turbines. Since that date, full UT inspections have been performed on six rotors at five nuclear power plants. Some indications in the keyway region have been reported in discs at three of these plants. General Electric personnel believe that these indications were caused by water erosion rather than by stress corrosion.

The staff desires to learn more about the underlying reasons for the indications found and the probable rate of growth of these indications and their effects on turbine disc integrity.

For this purpose, we request that you provide the information sought in Enclosure 3 to this letter and address its safety significance. Under the provisions of 10 CFR §50.54(f) your response is requested within 30 days of the receipt of this letter. A copy of this letter is being telecopied to you, along with Enclosure 3.

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Mr. I. R. Finfrock, Jr.


- 2 -

June 11, 1980

It is my understanding that additional UT inspections are to be performed by General Electric in the near future. We encourage this action as being the only certain means of determining the integrity of turbine discs. We also recommend that if you have not already done so, you develop a schedule for performing a full UT inspection of at least one of your low pressure turbines during the next major outage of your Oyster Creek Nuclear Generating Station.

This request for generic information was approved by GAO under clearance number B-180225 (S79014); this clearance expires June 30, 1980.

Sincerely,


Dennis M. Crutchfield, Chief
Operating Reactors Branch
Division of Licensing

Enclosures:

1. Information Bulletin
No. 70.37
2. Meeting Summary
3. Information Requests

cc: See next page

June 11, 1980

cc :

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26 Federal Plaza
New York, New York 10007

REQUEST FOR INFORMATION RELATED TO TURBINE DISCSSITE SPECIFIC GENERAL QUESTIONS - To Be Completed in 30 Days

- I. Provide the following information for each LP turbine:
- A. Turbine type
 - B. Number of hours of operation for each LP turbine at time of last turbine inspection or if not inspected, postulated to turbine inspection
 - C. Number of turbine trips and overspeeds
 - D. For each disc:
 - 1. type of material including material specifications
 - 2. tensile properties data
 - 3. toughness properties data including Fracture Appearance Transition Temperature and Charpy upper steel energy and temperature
 - 4. keyway temperatures
 - 5. critical crack size and basis for the calculation
 - 6. calculated bore and keyway stress at operating design overspeed
 - 7. calculated K_{Ic} data
 - 8. minimum yield strength specified for each disc
- II. Provide details of the results of any completed inservice inspection of LP turbine rotors, including areas examined, since issuance of an operating license. For each indication detected, provide details of the location of the indication, its orientation, size, and postulated cause.
- III. Provide the nominal water chemistry conditions for each LP turbine and describe any condenser inleakages or other significant changes in water chemistry to this point in its operating life.
- IV. If your plant has not been inspected, describe your proposed schedule and approach to ensure that turbine cracking does not exist in your turbine.
- V. If your plant has been inspected and plans to return or has returned to power with cracks or other defects, provide your proposed schedule for the next turbine inspection and the basis for this inspection schedule, including postulated defect growth rate.
- VI. Indicate whether an analysis and evaluation regarding turbine missiles have been performed for your plant and provided to the staff. If such an analysis and evaluation has been performed and reported, please provide appropriate references to the available documentation. In the event that such studies have not been made, consideration should be given to scheduling such an action.

GENERIC QUESTIONS - To Be Completed in 30 Days

- I. Describe what quality control and inspection procedures are used for the disc bore and keyway areas.
- II. Provide details of the General Electric repair/replacement procedures for faulty discs.
- III. What immediate and long term actions are being taken by General Electric to minimize future "water cutting" problems with turbine discs? What actions are being recommended to utilities to minimize "water cutting" of discs?
- IV. Describe fabrication and heat treatment sequence for discs, including thermal exposure during shrinking operations.