



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

December 31, 1979

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MEMORANDUM FOR: Chairman Ahearne
Commissioner Gilinsky
Commissioner Kennedy
Commissioner Hendrie
Commissioner Bradford

THRU: Executive Director for Operations *TAR for L.U.G.*

FROM: Harold R. Denton, Director
Office of Nuclear Reactor Regulation

SUBJECT: POINT BEACH UNIT 1 - STEAM GENERATOR TUBE DEGRADATION

In the Confirmatory Order for Modification of License dated November 30, 1979 (Order), certain requirements were made pertaining to the operation of Point Beach Unit 1. In the Safety Evaluation appended to that Order, certain remedial actions were discussed. Among these remedial actions we noted that the licensee planned to operate the facility at a reactor coolant pressure of 2000 psia rather than 2250 psia to reduce the internal pressure stresses by about 15% during operation (Action No. 3, pp. 15). This action was to be initiated upon NRC approval of an amendment request dated November 2, 1979, which requested permission to operate at that pressure. In the same Safety Evaluation we discussed "Measures for Reducing the Rate of Degradation" on pp. 22 and 23. We indicated that the acceptability of this proposed operation would be addressed separately.

The Order of November 30, 1979, was based on information resulting from the steam generator tube inspection following the October 1979 leak. On December 11, 1979, another steam generator leak occurred. An eddy current test was performed on both steam generators which resulted in eddy current indications below the tube sheet (in the tube crevice) in both steam generators. Twenty tubes were plugged in steam generator A and fifteen tubes were plugged in steam generator B. Since there appears to be evidence of continuing intergranular corrosion attack, the NRC staff has now found that it is not only desirable, but prudent and necessary, to take immediate action to require the reactor coolant pressure to be reduced from 2250 psia to 2000 psia since this will have the effect of substantially reducing the differential pressure across all tubes in both steam generators.

As explained below, operation of Unit 1 at a reactor coolant pressure of 2000 psia is acceptable from an accident analysis point of view. The applicable criteria for transient and accident are still satisfied.

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Since the licensee's amendment request was for operation at either 2250 psia or 2000 psia, he has recently withdrawn his amendment request and has made a commitment to operate Unit 1 at a reactor coolant system pressure of 2000 psia.

Summary Evaluation

Operating the facility at a reactor coolant pressure of 2000 psia rather than 2250 psia will reduce the internal pressure stresses during operation by about 15%.

The systems performance aspects of this change was evaluated by the licensee. Two trip setting changes are required. These relate to DNBR protection and low reactor pressure protection. Several accidents were reanalyzed using standard Westinghouse methods. These included the LOCA and the Rod Ejection Accident. We have concluded that the appropriate reactor protection criteria continue to be met.

Degraded Tubes Above the Tube Sheet

Since our November 28, 1979 Commission meeting, the staff has learned of five degraded tubes, located at or above the surface of the tube sheet, that were detected and plugged during the October-November plant outage. The licensee have examined this information and determined that it is not associated with intergranular corrosion attack, the phenomenon occurring in the tube sheet crevice. The staff discussed this experience with the licensee in late December, and concurred that this degradation was associated with the thinning, or wastage phenomenon occurring during the 1972-1975 time frame.

Conclusion

The staff proposes to issue a Confirmatory Order, following the Commission briefing now scheduled for January 2, 1980.

Harold R. Denton
for Harold R. Denton, Director
Office of Nuclear Reactor Regulation

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OUTLINE

POINT BEACH UNIT 1 - STEAM GENERATOR STAFF DISCOVERY OF DEFECTS AT AND ABOVE TOP OF TUBE SHEET - IMPACT ON SAFETY EVALUATION DATED NOV. 30, 1979

- A. DISCUSSION OF 5 DEFECTS ABOVE TUBE SHEET
 - WHEN DEFECTS WERE DISCOVERED AND UNDER WHAT CIRCUMSTANCES
 - SAFETY SIGNIFICANCE
 - STAFF'S EVALUATION/ACTIONS

- B. SUPPLEMENTAL CONFIRMATORY ORDER
 - REDUCE PRIMARY SYSTEM PRESSURE
 - SAFETY EVALUATION
 - ADMINISTRATIVE VEHICLE

CHRONOLOGY OF EVENTS
POINT BEACH UNIT 1 - STEAM GENERATOR

- . 10/05/79 - POINT BEACH UNIT 1 SHUTDOWN FOR REFUELING AND STEAM GENERATOR INSPECTION
- . 10/29/79 - CONFERENCE CALL WITH LICENSEE
- . 11/05/79 - MEETING WITH LICENSEE
- . 11/16/79 - LER 79-017/OIT-0 ISSUED BY LICENSEE
- . 11/19/79 - LER RECEIVED BY NRC (I&E)
- . 11/20/79 - MEETING WITH LICENSEE
- . 11/23/79 - LICENSEE SUBMITTAL
- . 11/28/79 - COMMISSION BRIEFING
- . 11/30/79 - CONFIRMATORY ORDER AND SUPPORTING SER
- . 11/30/79 - LER LOGGED INTO TERA
- . 12/01/79 - RESUMPTION OF POWER AT POINT BEACH UNIT 1
- . 12/04/79 - GENERIC MEETING WITH I&E (POINT BEACH - ONE TOPIC OF DISCUSSION)
- . 12/07/79 - NRR BECAME AWARE OF LER
- . 12/07/79 - TELEPHONE CONVERSATION WITH ENVIRONMENTAL DECADE REGARDING AXIAL LOCATION OF DEFECTS
- . 12/11/79 - POINT BEACH UNIT 1 SHUTDOWN DUE TO STEAM GENERATOR LEAK

CHRONOLOGY OF EVENTS
POINT BEACH UNIT 1 - STEAM GENERATOR

- . 12/13/79 - CONFERENCE CALL TO LICENSEE - REQUESTED EXPLANATION OF LER DATA
- . 12/13/79 - DISCUSSION OF 5 TUBE DEFECTS ABOVE THE TUBE SHEET WITH THE ENVIRONMENTAL DECADE
- . 12/16/79 - TRIP TO POINT BEACH UNIT 1
- . 12/18/79 - ADDITIONAL REQUEST FOR INFORMATION REGARDING 5 TUBE DEFECTS - REQUIRED BEFORE RESTART
- . 12/21/79 - RECEIPT OF LICENSEE'S SUBMITTAL OF DECEMBER 21, 1979
- . 12/21-22/79 - REVIEW OF LATEST SUBMITTAL

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SUMMARY OF PRIMARY AND SECONDARY OPERATING
CONDITIONS

NORMAL OPERATING CONDITIONS
100% POWER

PRIMARY

PRESSURE = 2250 PSIA
HOT LEG TEMPERATURE = 597⁰F
COLD LEG TEMPERATURE = 542⁰F

SECONDARY

PRESSURE = 800 PSIA*
TEMPERATURE = 500⁰F

$\Delta P = 1450 \text{ PSI}$

OPERATING CONDITIONS 11/30/79 TO PRESENT
80% POWER

PRIMARY

PRESSURE = 2250 PSIA
HOT LEG TEMPERATURE = 557⁰F
COLD LEG TEMPERATURE = 510⁰F

SECONDARY

PRESSURE = 600 PSIA*
TEMPERATURE = 450⁰F

$\Delta P = 1650 \text{ PSI}$

PROPOSED OPERATING CONDITIONS
80% POWER

PRIMARY

PRESSURE = 2000 PSIA
HOT LEG TEMPERATURE - 557⁰F
COLD LEG TEMPERATURE - 510⁰F

SECONDARY

PRESSURE = 600 PSIA*
TEMPERATURE = 450⁰F

$\Delta P = 1400 \text{ PSI}$

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REDUCED PRIMARY AND SECONDARY OPERATING PRESSURES

- 1) REDUCE THE POTENTIAL FOR CORROSION DURING NORMAL OPERATION
- 2) MITIGATE THE EFFECTS OF POSTULATED ACCIDENTS (MSLB AND LOCA) ON TUBE INTEGRITY

* SECONDARY SYSTEM PRESSURES ARE DICTATED BY SATURATED CONDITIONS