

50-287

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TO: Edson G. Case

FROM:
Duke Power Co.
Charlotte, NC
W. O. ParkerDATE OF DOCUMENT
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DESCRIPTION

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ACKNOWLEDGED

PLANT NAME: Oconee Nuclear Power Station
Unit No. 3
RBT 7/27/77

ENCLOSURE

Report of a leak in the "B" steam generator of approximately 0.2 gpm, which increased to 0.4 gpm in 17 days and subsequent inspection which revealed a crack in tube 2. A report is in progress addressing a main steam line break and LOCA with concurrent steam generator tube leaks which will show that in the worst case condition the plant can be operated without undue risk to the public health and safety.

2p

SAFETY

FOR ACTION/INFORMATION

ENVIRONMENTAL

ASSIGNED AD:

BRANCH CHIEF:

PROJECT MANAGER:

LICENSING ASSISTANT:

ASSIGNED AD:

BRANCH CHIEF:

PROJECT MANAGER:

LICENSING ASSISTANT:

V. MOORE (LTR)

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EXTERNAL DISTRIBUTION

CONTROL NUMBER

LPDR: Walhalla SC

TIC

NSIC

NAT LAB

REG IV (J. HANCHETT)

16 CYS ACRS SENT CATEGORY B

Misc
24
772080312

DUKE POWER COMPANY

POWER BUILDING

422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

July 21, 1977

TELEPHONE: AREA 704
373-4083

Mr. E. G. Case, Acting Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Reference: Oconee Nuclear Station
Docket No. 50-287

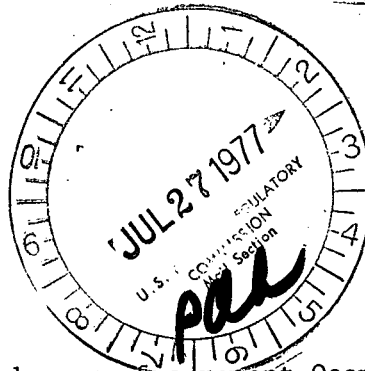
Dear Mr. Case:

In a June 17, 1977 letter we appraised your of a recent Oconee Nuclear Station steam generator leak which had occurred in the Unit 3 "B" steam generator. A commitment was made at that time to provide information regarding the performance of the unit after power operation was resumed. As subsequently discussed with members of your staff, Oconee 3 developed a primary-to-secondary leak of approximately 0.2 gpm shortly after power operation resumed. Continued operation of the unit with this small leakage rate was considered acceptable and was within limits. During 17 days of operation, the leakage rate increased to approximately 0.4 gpm and the unit was shutdown for repairs on July 14, 1977.

Examination of the Oconee 3 "B" steam generator has revealed that tube 2 of row 77 has a circumferential crack of between 60° and 90° at the bottom of the upper tubesheet. This follows the failure mode observed in previous tubes. Additional tubes have been inspected through the use of eddy current techniques and no other defective tubes have been identified. Tube 1 and 2 of row 77 have been removed from service by the installation of a stabilizer rod in a manner similar to that of other tubes at Oconee. Tube 1 did not have any deleterious indications; however, it was removed from service as a precautionary measure.

An analysis addressing a main steam line break (MSLB) and LOCA with concurrent steam generator tube leaks is in progress. The report is scheduled for completion in early August, 1977. The results of the report will be directly applicable to this latest tube failure, given the similarity between this failure and the previous lane tube failures.

The report will show that, based on the observation of existing failed specimens, the maximum anticipated effect of a MSLB on a leaking SG tube will be to marginally increase the leak area without severance of the tube, such that flow through the tube could be maintained even after a MSLB. In spite of this, analyses have been performed assuming guillotine failure of 1, 3 and 10 tubes in conjunction with the MSLB. These



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July 21, 1977

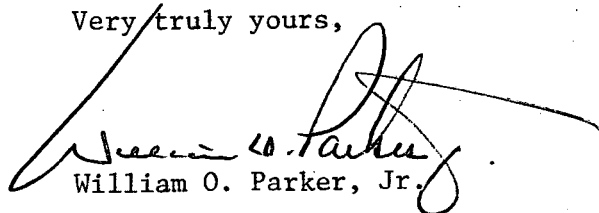
failures result in primary to secondary leak rates at the moment of the break of 46 lbm/sec, 136 lbm/sec, and 445 lbm/sec, respectively. As a result of the expected behavior of the leaking SG tubes following a MSLB, it is fully anticipated that the leak rate of 445 lbm/sec is representative of the failure of a much larger number of tubes than the ten assumed in the analysis. Since the probability of 10 or more tube failures following a MSLB is very small, it is concluded that the 10 tube guillotine break case addressed in the analyses represents an event bounding the consequence of a credible MSLB event with concurrent rupture of SG tubes.

For all cases, detailed dynamic loop analyses using the TRAP 2 computer model and DNBR calculations using the RADAR computer model indicate that no additional fuel is expected to fail due to consideration of concurrent tube ruptures. Longer term dynamic loop analyses using a CRAFT computer model indicate that for all cases, no return to power is experienced. For all cases, the core is also maintained covered throughout the transient and ample emergency injection water is available well beyond the termination of the accident.

Preliminary calculations show that maximum dose at the site boundary for a 10 tubes case will not exceed 15 rems thyroid assuming iodine spike at the time of rupture.

For the worst case of MSLB and 10 concurrent steam generator tube ruptures the environmental radioactivity releases are shown to result in site doses well within 10 CFR 100 limits. This, it is concluded that Oconee 3 can be operated without undue risk to the public health and safety.

Very truly yours,



William O. Parker, Jr.

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