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Duke Pwr. Co.

LTR 1 ENCL 0

SUBJECT:

SIZE: 3

Request Return to 1gpm allowable leakage rate for subj facil ~~is requested,~~ because ^{the} 0.3gpm leak rate results in ^a severe hardship in leak detection resulting in ^{an} extensive loss of elec generating capacity. Summary of inspec ready by 781130.

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CONTAINMENT LEAK RATE TESTING-APPENDIX J.

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NOTES: 1. M. Cunningham - all amendments to FSAR & changes to Tech Specs

OCT 18 1978

MAY
ECP

DUKE POWER COMPANY

POWER BUILDING

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

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

TELEPHONE: AREA 704
373-4083

October 6, 1978

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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Attention: Mr. R. Reid, Chief
Operating Reactors Branch #4

Re: Oconee Nuclear Station, Unit 1
Docket No. 50-269

Dear Mr. Denton:

The allowable primary-to-secondary leakage rate for the Oconee 1 steam generators (OTSG's) is currently 0.3 gpm. The former 1 gpm limit for Oconee 1 was reduced following Duke Power's report of the 14th Tube Support Plate (TSP) type defect in an Oconee 1 OTSG. The NRC staff considered that this defect might be similar to the widespread wastage present in recirculating steam generators for which a leakage limit of 0.3 gpm was imposed. This limit was imposed on Oconee 1 until Duke Power could provide additional information on seven items not initially available as supporting data. When the metallurgical examination of tubes with 14th TSP type defect was completed, the results were submitted to the NRC in addition to preliminary tube plugging criterion basis, defect growth information, results of visual inspections, and burst test results for partially degraded OTSG tubes.

Since the 14th TSP type defect can be well represented as general metal loss without other contributing factors (no cracking, cold working, etc.), the burst data previously submitted and that performed by Batelle for the NRC is representative of these defects.

Since the reduced leak rate was imposed as a consequence of these erosion type defects, Duke Power and B&W, the Oconee NSSS vendor, consider leak rate and burst tests for through-wall cracks to be unnecessary. For normal operation, a detectable leakage of 1 gpm has proven to result in a safe and orderly shutdown. Even in the remote

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possibility of ten tubes rupturing during a postulated main steam line break accident (MSLBA) occurring after a leaking tube has been discovered, 10CFR100 limits would still not be exceeded. However, it should be noted that for this type of defect, there is no correlation between leak rate and the number of degraded tubes.

Defect locations for leaks less than 1 gpm have proved extremely difficult to locate. This has resulted in instances of unit shutdown, failure to find the leak, return to power, and subsequent iterations before the leak was finally isolated. With a 1 gpm leak rate, detection and isolation has been considerably easier.

There has been no evidence of widespread wastage in OTSG's as has been detected in recirculating steam generators for which the 0.3 gpm leak rate limit was imposed. Only 15 leaking tubes have been detected in the six Oconee OTSG's since July, 1976, and none have been detected in other B&W plants. The frequency of leakers has diminished to less than one leaker/year for each of the three plants over the time period July, 1977 to the present. The last leaker on Oconee 1 was April, 1978, at Oconee 2 in January, 1978, and in Oconee 3 in July, 1977. In all cases, after the leak was detected and prior to reaching the technical specification limit, the unit underwent an orderly shutdown and, sometimes after much difficulty in determining its location, the leaking tube was removed from service.

In 1977, a safety assessment of the tube leakage at the Oconee site was made. The probability of a MSLBA coincident with tube failures was calculated as well as a loss of coolant accident coincident with tube failure. Special emphasis was given to the study of MSLBA and concurrent tube failures since this occurrence results in the most severe environmental doses. The study showed that the probability of having a MSLBA with concurrent tube failures during an assumed four-day shutdown period after the first leaking tube was detected, ranged from 3.7×10^{-7} for a total of three ruptured tubes on Oconee 1 to 2.7×10^{-13} for ten tubes failing. Including the reduced frequency of leakers in the past year would reduce these probabilities still further. Even with the extensive conservatism used in the probability calculations, the analysis showed that the probability of a MSLBA or LOCA with concurrent rupture of more than five tubes was so small that these events could be considered incredible.

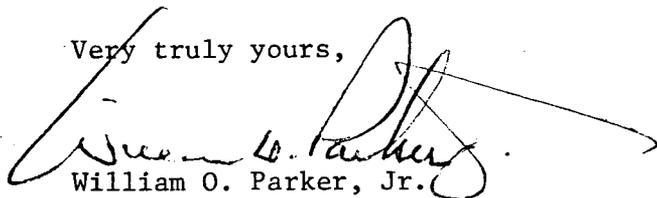
In view of the reduced leak rate limit having been imposed because of erosion type defects and not cracks, the low probability of having a LOCA or MSLBA with concurrent tube failure and the acceptable consequences obtained should such an event occur plus the fact that tube failures have occurred only very rarely, no burst or leak testing is deemed necessary

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for tubes with through-wall cracks. Since the 0.3 gpm leak rate results in a severe hardship in leak detection resulting in an extensive loss of electrical generating capacity, and since the OTSG's have not experienced the widespread tube leakage and wastage problems encountered by recirculating steam generators for which this lower limit was determined, a return to the 1 gpm allowable leakage rate for the Oconee 1 OTSG is requested.

Oconee Unit 1 is currently in a refueling outage and is undergoing steam generator tube inspection. A summary of the results of this inspection will be provided by November 30, 1978.

Very truly yours,

A handwritten signature in cursive script, appearing to read "William O. Parker, Jr.", with a long horizontal flourish extending to the right.

William O. Parker, Jr.

RLG:vr