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 AUTH. NAME: LEWIS, R.C. AUTHOR AFFILIATION: Duke Power Co.
 RECIP. NAME: RECIPIENT AFFILIATION: Region 2, Atlanta, Office of the Director

SUBJECT: LER 80-016/01T-0: on 800529, evaluation of steam generator tube failure in FSAR failed to consider release path for radioactive steam through main steam relief valves. Offsite thyroid dose calculations performed per 10CFR100.

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DUKE POWER COMPANY
OCONEE NUCLEAR STATION

Report Number: RO-269/80-16

Report Date: June 12, 1980

Occurrence Date: May 29, 1980

Facility: Oconee Nuclear Station, Seneca, South Carolina

Identification of Occurrence: FSAR Analysis of Steam Generator Tube
Failure Found to be Non-Conservative

Conditions Prior to Occurrence: Oconee 1 73% Full Power
Oconee 2 Cold Shutdown
Oconee 3 99% Full Power

Description of Occurrence:

On May 29, 1980, an inconsistency was discovered in the evaluation of a steam generator tube failure contained in Section 14.1.2.10 of the Oconee Nuclear Station Final Safety Analysis Report (FSAR). The analysis failed to take into account the direct release path of radioactive steam out the main steam relief valves (MSRV's). Babcock & Wilcox Company (B&W) identified this inconsistency when a similar concern arose while performing an evaluation for another reactor. The Oconee analysis assumed that all noble gases which leaked to the secondary side as a result of the tube failure were released directly to the unit vent. Thus, the whole body dose from noble gases calculated to be 0.023 rem at the one-mile exclusion distance remains essentially valid. However, credit was taken for partition of iodine in the condenser prior to release. The dose to the thyroid at the same distance was determined to be 0.00034 rem. A preliminary calculation which has been performed taking into account the release path through the MSRV's and considering potential additional delays in depressurizing the Reactor Coolant System due to unavailability of the reactor coolant pumps estimated a thyroid dose of 0.3 rem. This is still well within the guidelines of 10CFR 100.

Apparent Cause of Occurrence:

The FSAR evaluation correctly assumed that as steam generator pressure increased due to leakage from the ruptured tube, the turbine bypass valves would actuate at a lower pressure than the MSRV's. However, the analysis failed to note that the turbine bypass system did not have sufficient capacity to maintain steam pressure below the setpoints of the MSRV's, and that the MSRV's would therefore open during the initial phase of the transient.

Analysis of Occurrence:

A preliminary calculation indicates that a more correct value for the thyroid dose at the exclusion distance is approximately 0.3 rem, which is still very small with respect to the site criteria established in 10CFR 100. A further conservatism is introduced into this calculation by using the steam flow through the MSRV's calculated by B&W for the other unit. Since the Oconee units have a

greater turbine bypass capacity, the quantity of steam released through the MSRV's would not be as large. However, since the analysis contained in the FSAR was less conservative as a result of this error, it must be reported pursuant to Oconee Nuclear Station Technical Specification 6.6.2.1.a(8), although it is not considered to be significant with respect to safe operation or the health and safety of the public.

Corrective Action:

A more realistic calculation was performed taking into account the release path for radioactive steam through the MSRV's following a steam generator tube rupture in order to verify that the resulting offsite dose was still very small with respect to the guidelines of 10CFR 100. No other corrective actions are considered to be necessary at this time.

LICENSEE EVENT REPORT

EXHIBIT A

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0 2 It was determined that the evaluation of a steam generator tube failure con-									
0 3 tained in the Oconee FSAR failed to consider the release path for radioactive									
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0 6 of iodine. Preliminary calculations indicate that the resultant offsite									
0 7 dose is 0.3 rem, still well within the guidelines of 10CFR 100. Thus, safe									
0 8 operation and the health and safety of the public are not affected.									
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1 0 The FSAR analysis correctly assumed that the turbine bypass system would									
1 1 actuate at a steam pressure below the relief valve setpoints. However, the									
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1 5 the guidelines of 10CFR 100.									
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