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MEMORANDUM FOR: Karl R. Goller, Assistant Director for Operating Reactors, DOR

FROM: Brian K. Crimes, Chief, Environmental Evaluation Branch, DOR

SUBJECT: OCONEE RADIOACTIVE LIQUID EFFLUENTS - EXCEEDING REPORT LEVEL OF ONE-HALF DESIGN OBJECTIVE IN A QUARTER

PLANT NAME: Oconee Nuclear Station, Unit Nos. 1, 2 and 3  
 DOCKET NUMBERS: 50-269, 270, 287  
 RESPONSIBLE BRANCH: ORB-1  
 PROJECT MANAGER: D. Neighbors

By letter to the NRC dated April 25, 1977, Duke Power Company reported that the Oconee liquid radioactive releases had exceeded one-half the design objective releases in a calendar quarter. This release rate exceeded the 30-day reporting requirement of Specification 3.9.1. As a result of our review of these releases we have concluded that additional monitoring and administrative controls are required at the Oconee facility to keep radioactive releases as low as reasonably achievable in accordance with Appendix I to 10 CFR Part 50. We request that you initiate appropriate technical specification changes.

Per the reporting requirement the licensee must:

- a) Make an investigation to identify the cause for such release rates;
- b) Define and initiate a program of action to reduce such release rates to the design objective levels, and;
- c) Describe these actions in a report within 30 days.

The April 25, 1977 letter fulfilled the reporting requirement and referenced Attachment A to an April 20, 1977 letter from Duke Power (Mr. C. Horn, Jr.) to the NRC (Mr. E. Volgenau) to identify the cause and the corrective action taken. The April 25, 1977 letter also identified a February 15, 1977 letter from Duke Power to NRC which gave initial notification that one-half the design objectives were exceeded in the first quarter of 1977 and identified the incident causing the abnormally high

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releases (Reportable Occurrence Report RO-269/77-3, submitted to OI&E, NRC, Region II by letter dated February 3, 1977).

The Reportable Occurrence Report described an inadvertent release of liquid radioactivity (~3.2 Ci of I-131) from Unit 1 to the Keowee River. The incident identified as causing this release was a main generator hydrogen cooler gasket leak to the turbine building sump with the sump aligned to discharge to the oil collection basin while steam generator was being leak tested to repair a steam generator tube leak. The usual procedure for identifying a leaking tube is to drain the steam generator to liquid radwaste system if the secondary water is contaminated. The steam generator is then filled with clean water. A change was made in these procedures allowing leak testing prior to drainage of the steam generator to radwaste. During the testing a leak developed in the hydrogen cooler gasket. This leak resulted in an unmonitored and uncontrolled discharge to the Keowee River which resulted in releases exceeding the maximum instantaneous concentration limits of 10 CFR Part 20, Appendix B, Table II, Column 2. The total releases exceeded one-half the design objectives in a calendar quarter.

The April 20, 1977 letter from Duke Power, describing the corrective action to prevent reoccurrence, reiterated Oconee administrative procedure requirements for plugging steam generator tube leaks and for controlling secondary side contamination and leakage. The licensee did not propose the installation of any radiation monitors to alert the operators of a release nor a composite sampler which would provide a record of the magnitude of a release if it did occur. His position was that administrative control alone was sufficient to monitor and control radioactive liquids during periods of steam generator tube leakage.

On May 7, 1977 Oconee Unit 1 experienced a steam generator leak and reactor shutdown was commenced to find and repair the leak. Despite the administrative procedural controls that the licensee implemented to contain the radioactive liquids on the secondary side, radioactive liquid from the affected steam generator entered the turbine building sump via a steam system bypass valve. The turbine building sump was aligned to drain to the oil collection pond and the Keowee River. The contamination was detected by taking periodic grab samples from the sump. However the release continued for several hours before it was detected and corrective action taken. The quantity of radioactivity released was not significant, approximately 0.015 curies; however, lack of indication of the release of radioactive materials to the operators is a significant concern.

On June 1, 1977 the NRC staff (L. Barrett and S. Bland, EEB; D. Neighbors, ORPM; and A. Kowalczyk, Region II) met with the licensee at the Oconee site to discuss their method of controlling radioactivity in the secondary

OFFICE	system following a steam generator leak. The licensee described their					
SUMMARY	administrative procedural controls to contain radioactivity in the second-					
DATE	ary side. The turbine building drainage system, condensate polisher resin					

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disposal system, waste water collection basins, and oil collection basin were examined with respect to detecting, containing and controlling radioactive materials. It was noted that a radiation monitor had been installed to monitor the turbine building sump effluent on a trial basis.

While the licensee has improved the control of secondary side liquid radioactivity, the proposed administrative procedures alone are not considered adequate because of the complexity of the secondary system and the frequency of steam generator leaks. The release of radioactivity in May is an example of this. Although the licensee has instituted administrative procedures, a release of radioactive material did occur in an uncontrolled manner. Although in this case the amount was not significant, it was indicative of a lack of control over radioactivity which has the potential for release of a larger amount of radioactivity.

We consider that adequate control can be established by a combination of administrative procedures and installed instrumentation. Consequently we recommend that the licensee be requested to submit Technical Specification changes for the Oconee Station to:

- 1) include the installed turbine building sump monitor with an alarm in the control room,
- 2) add a composite water sampler at the outfall of the oil collection basin with weekly gamma spectra analysis and quarterly Sr-89, Sr-90 analysis, and
- 3) add procedural requirements for two independent checks on valve alignment for discharges of radioactive spent resin from the secondary water clean-up system to the receiving tanks to prevent an inadvertent release of highly contaminated resins following steam generator leaks to the waste water collection basin.

These positions have been discussed with Duke Power and the licensee has indicated that the changes would be implemented if required by NRC. With the above changes to the Oconee Technical Specifications, proper control over secondary side radioactivity can be maintained and inadvertent releases minimized.

Brian K. Grimes, Chief  
Environmental Evaluation Branch  
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