



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA ST., N.W., SUITE 3100
 ATLANTA, GEORGIA 30303

Report Nos.: 50-269/83-02, 50-270/83-02, and 50-287/83-02

Licensee: Duke Power Company
 422 South Church Street
 Charlotte, NC 28242

Docket Nos.: 50-269, 50-270, and 50-287

License Nos.: DPR-38, DPR-47, and DPR-55

Facility Name: Oconee

Inspection at Oconee site near Seneca, South Carolina

Inspector: J. J. Blake 1/25/83
Date Signed
 for N. Economos

Approved by: J. J. Blake 1/25/83
Date Signed
 J. J. Blake, Section Chief
 Engineering Program Branch
 Division of Engineering and Operational Programs

SUMMARY

Inspection on January 4-6, 1983

Areas Inspected

This routine, unannounced inspection involved 24 inspector-hours on site in the areas of licensee action on previous unresolved items, inspector followup items and licensee event reports (LERs).

Results

In the areas inspected, no violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *J. E. Smith, Station Manager
- *R. J. Brackett, Station Senior QA Engineer
- *T. Matthews, Licensing
- *R. Rogers, Licensing
- *R. Bond, Licensing
- C. Cheezem, ISI Engineer

Other licensee employees contacted included craftsmen, technicians, security force members and office personnel.

NRC Resident Inspector

D. Falconer

- *Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on January 6, 1983, with those persons indicated in paragraph 1 above.

3. Licensee Action on Previous Enforcement Matters

- a. (Closed) Unresolved Item 50-269, -270/82-24-01, -287/82-21-01, "Baseline Data Is Inadequate."

This item was opened by the staff in order to track the evaluation of certain linear indications identified in the upper tube-sheet to shell weld 3SGB-2G58-01 of once through steam generator (OTSG) "B". The indications in question have been evaluated under provisions of ASME Code Section XI. The results were subsequently submitted to NRR for their review. On October 12, 1982, NRR concurred with the licensee's evaluation method and proposed inspection plan.

- b. (Closed) 269/80-15-01, "Safe Shutdown Facility Pipe Code Edition."

By record review the inspector determined that the licensee's Design Engineering group identified the codes applicable to the safe shutdown facility as ASME Section III (74S75) and ANSI B31.1 (73S75).

- c. (Closed) 70/80-10-02, "Low Pressure Turbine Rotor Examination Procedure."

The licensee and GE met with the inspector to discuss UT examination techniques, and answered questions regarding personnel qualifications, calibration related UT procedural requirements and demonstrated the UT examination of the turbine rotors. GE provided Region II a copy of the GE ultrasonic examination procedure for review.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Licensee Event Reports (LERs)

- a. (Closed) LER-81-11, Core Barrel Assembly Thermal Shield Bolts Broken, (Unit 1). On January 8, 1982, the licensee submitted the final report on this occurrence. The report summarized and supplemented previous submittals regarding the Oconee 1 thermal shield bolt problem. The cause of the lower thermal shield bolt failure has been defined. Repairs have been completed and all other bolted joints using A286 bolts have been found to be satisfactory. RII staff have inspected this area and the work effort has been documented in several reports including 50-269/81-16 and 50-269/81-24. The licensee has concluded that a significant safety concern did not exist.

- b. (Closed) LER-81-16 RCP Lower Seal Housing Cap Screws with Magnetic Particle Crack Indications (Unit 1).

On September 17, 1981, the licensee submitted Reportable Occurrence (RO) Report RO-269/81-16 to inform Region II that crack indications were found on certain lower seal housing cap screws of reactor coolant pump 1A2. These indications were found during an ISI inspection. A subsequent metallurgical investigation, performed by Westinghouse Electro-Mechanical Division, reported to the licensee by Engineering Memorandum No. 5660, Rev. 0, on November 9, 1981, stated that what had been interpreted as circumferential cracks beneath the head in the shank were in fact pitting corrosion indications. The reports stated the extent of the pitting did not justify rejection of the remaining bolts and recommended their continued use.

- c. (Closed) LER-82-04, RC Normal Makeup Line Weld Radiography Test Indicated a Void (Unit 1).

On March 3, 1982, the licensee submitted exportable occurrence (RO) Report RO-269/82-04 to inform Region II that on February 17, 1982, examination of a radiograph on weld #85 on Isometric Drawing 11 of system 51A (High Pressure Injection) indicated a 360° circumferential void. The defective joint involved was where the one-inch nozzle warming lines connect to the 2½-inch normal makeup line on the 1A2 pump side.

Subsequently, the defective joint was replaced, radiographed and hydrostatically tested. Similar normal makeup line warming nozzle welds in the other two units were radiographed and repaired. Randomly selected radiographs were reviewed for code compliance.

- d. (Closed) LER-82-05, Experimental Zircaloy Spacer Grids Moved (Unit 2).

On March 12, 1982, the licensee notified RII that a fuel assembly with experimental Zircaloy spacer grids was inspected and found that the grids had moved upward from their designed position. On March 26, 1982, the licensee submitted RO Report RO-270/82-05 with a detailed description of the occurrence, apparent cause, analysis and corrective action(s). The inspector reviewed certain investigation reports generated by the licensee and the vendor (B&W). These give specific details on this incident. Corrective action was completed on March 18, 1982.

- e. (Closed) LER-82-06, 1"B" Steam Generator Tube Leak (Unit 1).

On March 6, 1982, the licensee notified Region II that a steam generator tube leak had developed in the 1B steam generator with a calculated leak rate of 0.08 gal/min. The apparent cause of the tube leak was a high cycle fatigue failure (crack) on tube 78-2. The tube was stabilized from the top and explosively plugged from the bottom. All tubes in the Lane Region were eddy current tested and no other defective tubes were found at that time. The licensee's analysis concluded the event did not affect the health and safety of the public. The Unit was turned over to Operations on March 19, 1982.

- f. (Closed) LER-82-02, Core Barrel Assembly Thermal Shield Bolts Broken (Unit 2).

This incident was essentially the same as RO Report RO-269/81-11 for which detailed descriptions and evaluations were provided by submittals dated July 24, 1981, August 5, 1981, October 5, 1981, and January 8, 1982. The results of the efforts conducted for the Oconee 1 incident were considered to be applicable to this incident at Oconee 2.

Replacement of the broken bolts was monitored and the work effort was documented in RII Reports 50-270/82-04, -09 and -19.

- g. (Closed) LER-82-03, Fuel Assembly Broken Holddown Springs (Unit-2).

On February 2, 1982, the licensee notified Region II that a broken holddown spring (HD spring) was discovered on Oconee 2, Batch 7 Fuel Assembly #01K3 during video inspection of the Oconee 2, Cycle 5 core in the Spent Fuel Pool. Subsequent inspection identified broken HD springs on Oconee 2, Batch 7 Fuel Assembly #01JC and 01KX.

The apparent cause of the broken springs is fatigue-induced cracking at an existing surface flaw which then propagated by fatigue. Analysis of unirradiated samples, from the same heat as the broken springs of the Oconee 2, Batch 7 Fuel Assemblies, indicated that this heat has good resistance to stress corrosion cracking, which was the apparent cause for the previous HD spring failures reported in RO-269/80-15 and submitted by letter dated June 6, 1980. The broken HD springs on Oconee 2, Batch 7 fuel assemblies were replaced prior to reloading these assemblies in the core. This activity was monitored by the site resident NRC inspector and documented in RII Report 50-270/82-04.

- h. (Closed) LER-287/82-04, HPI and Normal Makeup Nozzle Thermal Sleeve Loose and Safe End to Pipe Cracked, (Unit 3).

On February 26, 1982, the licensee notified RII that as a result of HPI-makeup nozzle safe end cracks at Crystal River-3 nondestructive examinations of Unit 3 HPI nozzle areas revealed that the 3A2 thermal sleeve was loose and displaced 5/8 inch upstream and that the safe end and upstream piping inside diameters (ID) were cracked. The RT of the 3B1 thermal sleeve indicated a partial radial gap between the thermal sleeve and safe end. 3A1 and 3B2 tests revealed no anomalies.

The licensee reported the apparent cause of failure as thermal fatigue. A Babcock and Wilcox owners group task force was established to investigate and identify the cause of failure.

The 3A2 cracked safe end, piping and thermal sleeve were replaced. The new thermal design incorporated features which should better resist movement. The 3B1 thermal sleeve safe end contact area was hard roll expanded to return the thermal sleeve to its intended condition.

This activity was monitored by the site resident inspectors and Region II based inspector(s). Region II reports where this matter is discussed include 50-287/82-05, /82-09, /82-10 and /82-12.

- i. (Closed) LER-270/82-04, HPI and Normal Makeup Nozzle Thermal Sleeve Loose and Safe End to Pipe Cracked (Unit-2). On March 2, 1982, the licensee notified the Region that the HPI makeup nozzle safe end cracking condition, found in Oconee-3 and reported on February 26, 1982, was present in Oconee-2. The failure mechanism and corrective actions were similar to those taken on Unit 3. Regional participation is discussed in RII Reports identified in paragraph 5h above.
- j. (Closed) LER-82-06, Auxiliary Feedwater Header Deformed (Unit-3).

On April 30, 1982, the licensee notified Region II that an inspection of the internal auxiliary feedwater header disclosed damage somewhat similar to that reported by Davis Besse and Rancho Seco. Additional information on this matter was submitted by the licensee on May 14, June 14, and August 27, 1982. In addition, the licensee provided

additional information to NRR in a report entitled "Oconee Unit 3 Auxiliary Feedwater Header Damage, Repair and Replacement." The report was from H. B. Tucker to H. R. Denton, dated September 10, 1982. The repair was monitored by Region II staff and documented in Report Nos. 287/82-13, -15, -19, -23, -27, -28 -30, and -33. The site resident inspectors witnessed the flow test of the new external headers.

6. Inspector Followup Items

- a. (Closed) 269, 270, 287/80-BU-08, "Examination of Containment Liner Penetration Welds."

The licensee's response, dated July 1, 1980, has been reviewed by Region II staff. A review of radiographs and related quality records of the applicable penetration welds was performed and documented in RII Report 50-269, -270, -287/81-05.

- b. (Closed) Item 50-269, -270, -287/82-10-01, "Relief Request From IWC-2430 Section XI Requirements on Main Steam Pipe Welds."

In order to resolve this matter, the licensee requested relief from ASME Code Section XI, IWC-2430 requirements. NRR agreed with the licensee's position and granted this relief for class-2 welds in the main steam, main feedwater and auxiliary feedwater pipe systems. Concurrently, the licensee applied for and received a code interpretation on IWC-2430 regarding the need to inspect additional welds when fabrication weld defects were found during ISI inspection on welds which were not required to be examined volumetrically during construction or during preservice inspection. In response to this inquiry, ASME Section XI stated that the requirements of IWC-2430 would apply regardless of whether the flaws were considered fabrication or service related. The licensee has included the additional welds for inspection at the next refueling outage.

- c. (Closed) 50-270/82-05-01, "Condition of Incore Instrumentation Tube."

In order to determine the condition of the R/V instrumentation (Incore) nozzles following the accident with ARIS equipment on February 7, 1982, the inspector interviewed cognizant personnel and reviewed the following documents:

TM/2/A/4000/107 Change No. 3 - Recovery of ARIS From Oconee Unit 2 Reactor Vessel.

TM/2/A/4000/109, February 18, 1982 - Inspection Requirements for RV Instrumentation Nozzles.

B&W Engineering Information Record #51-1131503-00, February 15, 1982

32-1131523-00, General Calculations - Damage to Incore Nozzle "50" by ARIS.

In order to prevent recurrence of this failure, the recommendation was made to install a limit switch on the ARIS to prevent it from making contact with incore nozzle(s).

- d. (Closed) 270/82-05-02, "Cause of R/V Inspection Tool Malfunction."

A review of the licensee's documented account of this incident disclosed that the malfunction resulted from two failures. The first failure involved an open electrical lead which provided ARIS mast vertical position information to the ARIS computer. This open lead should have been detected by the ARIS computer as a position error which should have shut the ARIS down. The second failure was the failure of the ARIS computer to detect this position error which should have shut ARIS down. The ARIS operator observed the ARIS moving in an unusual manner and then hit a manual override which shuts down ARIS. It was reported that the ARIS operator repeatedly tried to manually shutdown ARIS but the motion he was actually seeing was the ARIS mast falling in an uncontrolled motion after all of the ARIS drives had stopped due to his manual override actuation.

- e. (Closed) 270/82-05-03, "Volumetric Inspection of HP Injection Line Welds."

This item is discussed in paragraph 5.h of this report.

- f. (Closed) 287/82-33-01, "Cleanliness Requirements for Steam Generator Modifications."

Procedure NSM 2027, part E, Installation of External Auxiliary Feed-water Risers and Headers on 3"A" and 3"B" OTSG, was revised to provide for in process cleanliness inspections to be performed during the modification and prior to final closure of the OTSGs.

- g. (Closed) 287/82-33-02, "Disposition of ISI Inspection Results on Steam Generator "B" Weld 3SGB-2G58-01."

The licensee's package of analytical calculations was submitted to NRR for review and evaluation of the code rejectable indications in OTSG "B" of Oconee Unit-3. By memorandum dated October 12, 1982, NRR concluded that OTSG 3"B" qualified as "conditionally acceptable" for continued service. Moreover, pursuant to ASME Code Section XI, IWB-2420, "Successive Inspections," requirement, the licensee has scheduled to reexamine this weld over the next three inspection periods.