



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-269/94-04, 50-270/94-04 and 50-287/94-04

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 1, 2 and 3

Inspection Conducted: January 18-21, 1994

Inspector: *N. E. Economos*
N. E. Economos

2/10/94
Date Signed

Approved by: *J. J. Blake*
J. J. Blake, Chief
Materials and Processes Section
Engineering Branch
Division of Reactor Safety

2/10/94
Date Signed

SUMMARY

Scope:

This reactive announced inspection was conducted onsite in response to the licensee's report that fourteen mechanical tube plugs were found missing from the lower tubesheet of once through steam generator (OTSG) "B"; eight of these were observed inside the Reactor Vessel. In addition the inspector observed on-going Eddy-Current (ET), examination of OTSG tubes, reviewed ET results, associated procedures and quality records.

Results:

The licensee was cited for using an inadequate installation procedure and failure to provide adequate quality assurance oversight during plug installation. This citation is documented in the resident inspector's report 269,270,281/94-01. The plug installation procedure was revised and will be used as required during the current outage. Eddy Current examination of OTSG tubes was being performed in a satisfactory manner using adequate procedures and well trained personnel. Except for the citation above, violations or deviations were not identified.

9402230145 940211
PDR ADOCK 05000269
G PDR

REPORT DETAILS

1. Persons Contacted

Licensee Personnel

- *M. Bailey, Regulatory Compliance Engineer
- *J. Batton, Component Engineer, OTSG(s)
- *B. Carney, Component Engineer
- *T. Coleman, ISI Coordinator/Component Engineer
- *J. Davis, Safety Assurance Manager
- D. Dalton, Regulatory Compliance Engineer
- C. Freeman, NDE Supervisor
- *J. Hampton, Vice President Oconee
- T. Helderbraud, Supervisor ET Acquisition
- E. Painter Jr., Mechanical Maintenance Execution
- *B. Peele, Oconee Station Manager Support
- T. Tucker, Corporate Level III Examiner

Other licensee employees contacted during this inspection included engineers, inspectors, technicians, and administrative personnel.

NRC Resident Inspectors/Personnel

- *S. Ebnetter, Regional Administrator, Region II
- P. Harmon, Senior Resident Inspector
- L. Keller, Resident Inspector
- K. Poertner, Resident Inspector

*Attended exit interview

2. OTSG Plugs Found in Unit 3 Reactor Vessel

This inspection was performed in response to the licensee telephone report on January 12, 1994 that eight (8) mechanical SG tube plugs had been discovered in Unit 3 reactor vessel during a remote visual examination of internals. Specifically the subject plugs were observed on the lower grid assembly of the reactor vessel. A subsequent inspection of OTSG tube sheets revealed that a total of 14 plugs were missing from the bottom head of OTSG "3B".

During the aforementioned telephone conference B&WNT indicated that their review of installation records disclosed that the 14 missing plugs were from a group of 34 rolled plugs installed in OTSG "3B" lower tube sheet during the August 1992 refueling outage. B&WNT stated that their review of an archival video tape taken during plug installation suggested that the roll plugs were not torqued to the proper value during installation. B&WNT and the licensee attributed the problem to an intermittent malfunction of a proximity switch used to sense the stopping of the air motor shaft on the roll expansion tool, and a failure of the tool operator to properly interpret instrument indications that proper torque had not been achieved. A review of similar tapes from the other two Oconee Units identified one plug with the same condition in the upper tubesheet of OTSG "2B".

At the site, the inspector discussed the process with cognizant licensee personnel and reviewed procedure, 1154835A Revision 26, March 4, 1992 Field Procedure for Rolled Plugging and Flexible Segmented or Hybrid Stabilization. This revision was applicable to the installation of the failed plugs at Oconee Unit 3. In addition, the inspector observed the mockup unit, assembled for training of personnel and for demonstrating the operation of the roll expansion tool. The licensee and the contractor's Project Manager explained the operation of the tool and demonstrated the roll expansion of a plug similar to the ones installed in Unit 3. For a detail description of the subject tool and its operation see Region II report 50-269,270,289/94-01. Through these discussions and review of the aforementioned procedure and video tape, the inspector concurred with the licensee's assessment of the problem. In addition to malfunctioning equipment and personnel problems, the inspector noted that a failure of the applicable procedure to fully describe acceptance criteria and to require independent QC verification of the final product contributed significantly to this problem.

As stated earlier, a violation addressing these problems has been issued under Report 269,270,287/94-01. Corrective actions taken to improve process control and provide verifiable records to confirm that proper installation was achieved were as follows:

- Design Change Notice (DCN), number 94-0072. This DCN provides for a review of video tape by QC to confirm that proper torque has been achieved. It also provides a detail description of in-line parameters and conditions necessary for proper torque out.
- The roll tool was modified to change the cut-off of air supply from automatic to manual.
- Operators were receiving additional training on the use of the system, which will include recognition of system problems.

This problem suggests an apparent weakness in the licensee's overview of onsite vendor activities as evidenced by a failure to assure that the applicable procedure provided adequate process controls, acceptance criteria, and verifiable QC records of satisfactory plug installation.

Except for the violation discussed earlier in this paragraph, violations or deviations were not identified.

3. Inservice Inspection (ISI)

The inspector reviewed documents and records, and observed activities indicated below, to determine whether ISI was being conducted in accordance with applicable procedures, regulatory requirements, and licensee commitments. The applicable code for ISI is the American Society of Mechanical Engineers Boiler and Pressure Vessel (ASME B&PV) Code, Section XI, 1980 Edition with Addenda through Winter 1980. Oconee Unit 3 is in the 14th refueling outage and in the third (3rd) period of the second ten year ISI interval.

Review of Nondestructive Examination (NDE), Procedures, Unit 3
(IP-73052)

The following procedures have been reviewed for technical adequacy and consistency with applicable code and regulatory requirements during previous inspections (see Inspection Report 93-15). During the present inspection, the inspector reviewed the procedures for information, and to ascertain whether recent revisions had made substantive changes to the procedures.

| <u>Procedures No.</u> | <u>Title</u> |
|-----------------------|--|
| NDE-10 Rev. 18 | General Radiography Procedure (Nuclear Stations) |
| NDE-25 Rev. 15 | Magnetic Particle Examination Procedure and Techniques |
| NDE-35 Rev. 14 | Liquid Penetrant Examination |
| NDE-600 Rev. 2 | Ultrasonic Examination of Similar Metal Piping Welds in Wrought Ferritic and Austenitic Material |
| NDE-610 Rev. 1 | Ultrasonic Examination of Piping Welds using Refracted Longitudinal Waves |
| NDE-620 Rev. 1 | Ultrasonic Examination of Welds in Wrought Ferritic Pressure Vessels greater than 2 Inches in Thickness |
| NDE-630 Rev. 0 | Ultrasonic Examination of Welds in Wrought Ferritic and Austenitic Pressure Vessels 2 Inches in Thickness and Under |
| NDE-640 Rev. 0 | Straight Beam Ultrasonic Examination of Welds and Base Materials in Pressure Vessels and Piping |
| NDE-701 Rev. 2 | Multifrequency Eddy Current Examination of Steam Generator Tubing at McGuire, Catawba and Oconee |
| NDE-702 Rev. 0 | Eddy Current Data Screening Program |
| NDE-707 Rev. 1 | Multifrequency Eddy Current Examination of Non-Ferrous Tubing Using a Motorized Rotating Pancake Coil |

In addition to the applicable ASME Code Section XI, identified earlier in this report, the procedures above referenced ASME Code Section V, 1980 Edition with Winter 1980 and Winter 1981 Addenda.

The revisions and documents reviewed appeared to be consistent with referenced code requirements.

4. Eddy Current Examination of S/G(s) Tubes, Unit 3

As stated earlier, ISI activities during this outage included eddy current examination of tubes in "A" and "B" steam generators. Data acquisition and analysis was being performed in accordance with procedures identified earlier in this report. Controlling documents/code by reference, included ASME Code Section XI (80W80), Regulatory Guide 1.83 (July 1975), and Code Case N-401, Digitized Data Collection for Eddy Current Examination. Data acquisition was being performed by licensee personnel. Data analysis was being performed at the McGuire Nuclear Station. Examinations were being performed with a multifrequency bobbin coil technique, utilizing the computerized MIZ-18 system.

- Inspection Plan

The following summarizes the licensee's steam generator ET inspection program and status for the current outage.

- "Bobbin" Probe - The planned inspection included full length examination of approximately 60 percent (9331 for OTSG "A" and 9330 for OTSG "B"), of the tubes in each generator. At the close of this inspection all tubes had been examined and analyzed. No confirmed plugable tubes had been identified by the licensee.
- "Sleeve/Crosswound" - The planned inspection included 100 percent of the sleeves in both OTSGs (145 in "A" and 97 in "B"). Inspection was completed and all inspection results analyzed and resolved for the sleeve inspections.
- "MRPC LANE & WEDGE" - For "Lane and Wedge" area tubes, the planned inspection included 141 tubes in S/G "A" and 218 tubes in S/G "B". At the close of the inspection, all tubes scheduled for this type examination had been inspected and analyzed; no further problems were identified.
- "Re-expanded Tubes" - Three tubes in S/G "A" and one in S/G "B" were in the inspection program. Examination in both S/Gs had been completed; no further problems were identified.

- "ROLLED PLUGS" - Inconel-690: inspection plans called for examination of 100 percent of the inconel-690 plugs installed during the previous outage to establish baseline data. In addition 20 percent of the plugs which have been in service more than one fuel cycle were scheduled for inspection. Inconel-600: inspection plans called for examination of 100 percent of the plugs that could be inspected. A summary of pugs inspected during this outage is as follows:

| Baseline 100% | <u>A</u> | | <u>B</u> | |
|--|----------|-----|----------|-----|
| | H/L | C/L | H/L | C/L |
| Inconel-690 installed last outage | 74 | 74 | 56 | 52 |
| Balance-20% of I-690 plugs > one cycle and 100% of Inconel 600 | 74 | 76 | 56 | 51 |

Following the close of this inspection, the licensee provided the inspector the total number of tubes plugged as a result of this ET examination which were as follows:

| | S/G A | S/G B |
|------------------------------------|-------|-------|
| Tubes Plugged Prior to this Outage | 234 | 181 |
| Tubes Plugged During this Outage | 61 | 74 |
| TOTAL | 295 | 255 |

- Observation of Work Activities:

The inspector observed motorized rotating pancake coil examination of 20 special interest tubes in S/G "A" to verify compliance with applicable procedural requirements; witnessed end of data disc S/N 535 calibration, during examination of tubes from the upper tubesheet in S/G "A". The calibration was performed using ASME Code Standard S/N 49156. A new calibration was performed at this time for new data disc S/N 537. The inspector witnessed shift turnover and reviewed the daily log including personnel qualification for 15 ET examiners and certifications for seven MIZ-18A units.

Data acquisition observed and quality records reviewed were consistent with code and procedural requirements. Personnel appeared to be adequately trained and performed their work assignments in a professional manner. The licensee continues to demonstrate good technical strength in this area of the NDE program.

5. Exit Interview

The inspection scope and results were summarized on January 21, 1994 with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results contained in this report. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any materials provided to or reviewed by the inspector at this time.