



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

Report Nos.: 50-269/85-33, 50-270/85-33, and 50-287/85-33

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: September 23-26, 1985

Inspector: *J. J. Blake* 10/17/85  
 N. Economos Date Signed

Approved by: *J. J. Blake* 10/17/85  
 J. J. Blake, Section Chief Date Signed  
 Engineering Branch  
 Division of Reactor Safety

SUMMARY

Scope: This routine, unannounced inspection entailed 32 inspector-hours in the areas of Unit 3 inservice inspection (ISI), review and record evaluation, main feedwater flow-nozzle post weld heat treatment; closing of open items; reassembly of reactor coolant pump 3A2 - work observation and record review.

Results: No violations or deviations were identified.

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## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*M. S. Tuckman, Station Manager
- B. Millsaps, Mechanical Technical Support Engineer
- B. Carney, Mechanical Technical Support Engineer
- R. J. Brackett, Senior QA (Quality Assurance) Engineer
- R. H. Ledford, QA Technical Support Supervisor
- W. R. Hunt, ISI Coordinator
- J. M. Crowe, Technical Support QA
- C. R. Hensen, Welding/NDE (Nondestructive Examination) Inspector, Quality Control (QC)
- \*T. C. Matthews, Compliance

#### Other Organization

Babcock and Wilcox (B&W), Special Products and Integrated Field Services  
H. E. Stopplemann, ISI Coordinator

#### NRC Resident Inspectors

- \*J. C. Bryant, Senior Resident Inspector
- \*K. Sasser, Resident Inspector
- \*L. King, Resident Inspector

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on September 24, 1985, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee.

(Open) Unresolved Item (UNR) 287/85-33-01, Main Feedwater Flow Nozzle Weld Postweld heat treatment (PWH) documentation, paragraph 5.

The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

### 3. Licensee Action on Previous Enforcement Matters

(Closed) Unresolved Item (UNR) 287/85-27-04, ISI Radiographs Area of Interest Coverage. The inspector reviewed actions taken by the licensee to demonstrate that ISI radiographs depicting what was believed to be

inadequate area of interest coverage met code requirements. These demonstrations included measurements of weld reinforcement, description of adjoining parts/components and overlays. The licensee agreed to use lead markers (shot) to mark the weld edge and thereby eliminate questions of this sort in the future.

#### 4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. New unresolved items identified during this inspection are discussed in paragraph 5.

#### 5. Independent Inspection Effort (92706, 62700)

- a. Reactor Coolant Pump (RCP) Bearing Housing Assembly Bolt Failures - Unit 3. This work effort was a followup to that documented in Report 287/85-27 concerning the discovery of certain broken bolts on the upper and lower sections of the bearing housing assembly (BHA) in RCP-3A2. At the time of this inspection, the licensee had reassembled the pump and was preparing to start tensioning the main flange studs. The inspector observed portions of this work effort, inspected the work area, discussed the activity with the cognizant engineer, and reviewed quality records of the following items.

<u>Component</u>	<u>Purchase Order No.</u>	<u>Purchase Order Item No.</u>	<u>Heat No.</u>
Stuffing Box	40781	Z6866	----
Thermal Barrier Studs	47037 M40887-73	H1862 ----	---- C25230 A540CL-5, Gr-B23
Nuts	D-0065	----	C25220 A540CL-5, Gr-B23
Impeller Assembly	C-8062	904-1	44226-#2 A351-65, Gr-CF 8
Shaft Assembly	C-8062	904-1	534820-3T Type - 31655

The impeller and shaft assembly were purchased from Three Mile Island (TMI) when it was discovered that reassembly to manufacturer's specification could not be achieved. The licensee believes that the rework on the bearing housing assembly may have contributed to this problem.

Within these areas, no violations or deviations were identified.

#### b. Postheat Treatment of Main Feedwater Flow Nozzle Welds

Ocone Nuclear Station Maintenance Directive IV H dated June 20, 1985, (Directive) is the licensee's controlling document for welding and thermal treatment (preheat, postheat) of welds. Section 8 of this

Directive provides specific instructions for postweld heat treatment of weld repairs performed under ASME Code Sections XI and III as well as for field weld joints fabricated under ANSI B31.1, 1967. The Directive identified the maintenance engineer or his designee as responsible for specifying and preparing the applicable data sheets according to instructions in Section 9 of the Directive. Paragraph 9.2.2 Postweld Heat Treatment, requires the postweld heat treatment to be done in accordance with Form MWP-22A Postweld Heat Treatment Data Sheet, and the activity to be monitored with temperature sticks or pyrometers as applicable. Methods used to control and document temperatures are specified under paragraph 9.2.4 of this Directive.

Subparagraph 8.2.8.3 of the Directive states that, postweld heat treatment shall be monitored by Quality Control Inspectors in accordance with Quality Control Procedure QCL-1 R/10.

Feedwater flow nozzle welds 1A, 1B, 1C and 1D were fabricated and postweld heat treated under requirements of ANSI B31.1-67 Power Piping Code. Paragraph 131.3.4 of this code states that postheat treatment temperatures shall be checked by ... thermocouple pyrometers...to assure that the requirements established by Table 131... are accomplished. Also, paragraph 131.3.7 identifies the minimum width of material (band) e.g. weld plus base metal, to be postweld heat treated and, requires that the entire band be brought up to the uniform specified temperature over the complete circumference of the pipe section with gradual diminishing of the temperature outward from the edges of the band. In response to the inspector's request for objective evidence for review and evaluation to determine whether the above code and procedural requirements had been met, the licensee provided the inspector with (1) a copy of Form MWP-22A, showing the location of the thermocouple and heating elements relative to the weld joints - the thermocouples and recording instruments used were not identified; (2) the strip charts showing time and temperature profiles for each of the four welds and (3) related weld cards. Although postweld heat treatment was marked on the weld cards as required, this line item had not been signed off by QC.

In discussions with cognizant licensee personnel, the inspector indicated that:

- a. As depicted on Form MWP-22A, positioning the thermocouples on top of the weld instead of locating them strategically over the band of material requiring postweld heat treatment is not in full compliance with paragraph 131.3.7(c) of the code which requires uniform temperature control over the entire band and for the full circumference of the pipe. Also, the inspector stated that failure to identify the thermocouples and their respective recording instruments complete with calibration record(s) diminishes the validity of the strip chart information whose accuracy is heavily dependent on calibration and therefore it is

difficult to say whether the recorded temperatures and times met the requirements of Table 131 of the code.

- b. Judging from the weld cards, it did not appear that QC inspectors had monitored this activity as this line item had not been signed off on the weld cards. Discussions with cognizant QC personnel revealed that QCL-1 does not apply to ANSI B31.1 Code Class G welds. The inspector indicated that lack of QC participation, in this phase of weld fabrication, was contradictory to the other inspections on these welds, particularly since all four welds were fabricated in accordance with weld procedures and welders qualified to Section IX of the ASME Code and radiographed in accordance with procedure NDE-10A which complies with ASME Section V/ANSI B31.1.
- c. With regards to controls on postweld thermal treatment of ANSI B31.1 code welds the Directive, as written, tends to be inadequate in that it disregards the requirements and implications of paragraphs 131.3.4 and .7 of the Code except for those welds identified as safety-related. Also, in reference to temperature recording instruments, subparagraph 9.2.4.2.2 of the Directive requires that instrument calibration be maintained in accordance with applicable Administrative and Maintenance procedures but it fails to identify and/or reference these procedures. Also subparagraph 9.2.4.2.4 requires, without exception to type of weld or classification that thermocouples be tack welded per qualified weld procedures and welders, and that the activity be inspected by QC inspectors per procedure QCL-1. However, in that QCL-1 does not apply to the aforementioned welds which are ANSI B31.1 category Class G, nonsafety, it could not be ascertained at this time whether QC inspected this activity. Cognizant licensee personnel disclosed that the aforementioned Directive is presently undergoing revision and indicated that the above comments/concerns would be taken under consideration and addressed in the revised document. Finally, the inspector reviewed radiographs of the aforementioned welds for compliance with applicable code requirements.

Until the revised document can be reviewed to determine whether the above concerns have been addressed, the matter was identified as Unresolved Item 287/85-33-01, Main Feedwater Flow Nozzle Weld PWH Documentation.

#### 6. Inservice Inspection, Data Review and Evaluation, Unit 3 (73755)

Records of completed nondestructive examinations were selected and reviewed to ascertain whether the methods technique and extent of the examination complied with the ISI plan and applicable NDE procedures; findings were properly recorded and evaluated by qualified personnel; programmatic deviations were recorded as required; personnel, instruments, calibrations blocks

and NDE materials (penetrants, couplants) were designated and qualifications/certifications were on file. The applicable code for this activity was ASME Section XI (80.W81). Records selected for this review were as follows:

#### Ultrasonic Examination

Reactor Coolant Pump Main Flange Studs QA Tag #46780 HT #C25230 S/N - Many	18½"x4.372	0" Scan
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#### Visual Examination

Reactor Coolant Pump Main Flange Nuts QA Tag #45630 Heat #C25220 S/N Many	4"x2½"	Visual (VT-1)
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#### Ultrasonic Examination

E04.001.001	A-1 Discharge Makeup Nozzle Safe End - HPI Thermal Sleeve	3½x0.95"	Nine Inds. identified ranging from 60% to 200% DAC Radiography performed, evaluated by Level III. Believed to be debris trapped between thermal sleeve and pipe.
B03.130.001	3A W-Z Axis Outlet Nozzle, 35GA-WG50-2		Two 360° continuous indications off nozzle ID. Evaluation Report (ER) #85-06
B09.011.212	High Pressure Injection (HPI) Pipe to Tee. W #3-51A-63-09		Two Intermittent indications @ root of weld. ER #85-07
B09.011.211	3A1, HPI Valve to Pipe W #3-51A-63-03		Two Intermittent Indications each 100% and 400% DAC ER #85-0008
B09.011.203	Decay Heat Terminal End Pipe to Nozzle, Hot Leg A side W #3-53A-18-11		Two Intermittent Indications each 90% and 159% DAC ER #85-009

C05.021.004	Low Pressure Injection Elbow and Pipe W #3-53A-24-09	One Intermittent Indication @ 200% DAC 360° at root of weld ER #85-010
C05.021.005	Low Pressure Injection Pipe to pipe W #3-53A-24-9A	One Intermittent Indication 200% DAC, 360° at root of weld ER #85-011
C02.021.002	Generator A Steam Outlet Nozzle X-Y, Axis W #3SG-A-WG23-2	One Intermittent Indication 335% DAC, 360°. Geometric reflector from nozzle inside radius ER #85-004
C02.021.003	Generator B Steam Outlet Nozzle W-X, W #3SGB-WG23-1	One Intermittent Indication 251% DAC, 360° Geometry from nozzle inside radius ER #85-005
C01.010.003	Steam Generator "A", Nozzle Belt to Shell W #3SGA-WGB-3	Four Intermittent indications 141% to 251% DAC - all geometries limited scan to one side of weld because of high radiation. ER #85-002
C01.010.004	Steam Gen A, Nozzle Belt to Shell W #3SGA-WG8-4	Four Intermittent indications 100% to 159% DAC - all geometries because of configuration ER #85-001

Evaluation of these indications were being performed by the licensee at the time of this inspection. Results of these evaluations will be reviewed by the inspector on a routine basis on a future inspection.

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