

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

Report Nos.: 50-269/91-21, 50-270/91-21, and 50-287/91-21	
Licensee: Duke Power Company 422 South Church Street Charlotte, NC 28242	
Docket Nos.: 50-269, 50-270, License Nos.: DPF and 50-287	R-38, DPR-47, and DPR-55
Facility Name: Oconee 1, 2, and 3	
Inspection Conducted: August 19-23, 1991	•
Inspectors: <u>J. L. Soley</u> <u>J. L. Soley</u> <u>R. C. Chou</u> <u>R. C. Chou</u>	$\frac{9-5-91}{\text{Date Signed}}$ $\frac{9-4-91}{\text{Date Signed}}$
Accompanying Personnel: J. J. Blake, Section Chief, August 20 T. McLellan, NRR, August 20 and 21, 1 J. Hornseth, NRR, August 20 and 21, 1 T. Taylor, Battelle Northwest, August), 1991 only 991 only 991 only 20 and 21 only 9/1/5/
J. J. Blake, Chief	Date Signed
Materials and Processes Section Engineering Branch	
Division of Reactor Safety	

SUMMARY

Scope:

This special, announced inspection was conducted in the areas of inservice inspection (ISI) - review of procedures, observations of work and work activities, and evaluation of recorded data for the ten year reactor vessel examinations on Unit 1. In addition to the reactor vessel examinations, Unit 1 pipe supports and snubbers were examined as well as associated procedures, drawings and recorded data.

Results:

The automated ultrasonic examinations on the Unit 1 reactor vessel were proceeding in a timely manner. Analysis of the recorded data had not revealed any significant indications. However, several minor indications were scheduled for further evaluation and sizing prior to completion.

In the areas inspected, violations or deviations were not identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*N. Barron, Station Manager

*T. Coleman, ISI Coordinator, Quality Assurance

*T. Curtis, Compliance Manager

*B. Dolan, Design

*F. Linsley, Nuclear Production Engineer

*J. McArdle, Level III, Nondestructive Test Examiner

*B. Millsaps, Manager, Maintenance Engineering

*R. Morgan, QA Director

*S. Perry, Assistant License Coordinator

*R. Rouse, Quality Assurance Specialist, ISI

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

Babcock and Wilcox (B&W)

*D. Fairbrother, Manager NDE Services
 *A. Richmond, Task Leader, ARIS Vessel Examinations
 M. Hacker, Level III, Nondestruction Test Examiner

NRC Resident Inspectors

P. Harmon, Senior Resident Inspector

*K. Poertner, Residence Inspector

*B. Desai, Residence Inspector

*Attended exit interview

2. Inservice Inspection (73052) (73753) (73755)

The inspectors observed activities as indicated below, to determine whether ISI work 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 Winter 1980 addenda. Unit 1 is presently in the first outage, of the third 40 month period of the second ten year ISI interval.

a. Volumetric Examination of Unit 1 Reactor Vessel Welds Using the Automated Ultrasonic Technique

The inspectors, with the assistance of two NRR representatives and their consultant, reviewed ISI procedures, personnel certifications,

B&W's Quality Assurance Program, and observed B&W (the vendor for the second ten year reactor vessel examinations) ultrasonically acquire weld and base metal data. In addition, the inspectors concurrently analyzed recorded computerized data to determine whether the data met the applicable requirements listed above. B&W utilized their ARIS II in-vessel computer controlled remote manipulator to scan the reactor vessel and associated piping welds. The ultrasonic examinations were performed using B&W's Accusonex Data Acquisition and Imaging System. Specific procedures reviewed and work activities observed by the inspectors are delineated below:

(1) Review of ISI Procedures

- B&W Nuclear Service Company Procedure No. ISI-138, Revision 6, "ARIS II Ultrasonic Examination for Reactor Vessel and Associated Piping Welds Using Accusonex"
 - B&W Inservice Inspection Procedure No. ISI-50, Revision 11, "Technical Procedure Describing Surface Requirements of Welds, Adjacent Base Metal, and Components for Nondestructive Examination"
- B&W Nuclear Service Company Procedure No. ISI-83, Revision 9, "Measurement of Ultrasonic Instrument Performance Characteristics"
- B&W Nuclear Service Company Procedure No. ISI-21, Revision 16, "Administrative Procedure for the Written Practice of Personnel Qualification in Ultrasonic Examinations"
 - B&W Nuclear Services Procedure No. ISI-1, Revision 8, "Administrative Procedure for Control of ISI Procedures and Procedure Qualifications"
- B&W Nuclear Services Procedure No. ISI 61, Revision 21, "Administrative Procedure for Approval and Control of B&W Nuclear Services Prepared Manuals and Reports"
 - B&W Nuclear Services Procedure No. ISI-76, Revision 17, "Administrative Procedure for the Design Fabrication and Certification of Calibration Standards"
- Duke Power Inspection Procedure No. QAL-14, Revision 12, "ISI Visual Examination, VT-3 and VT-4

As a result of the above procedural reviews the inspectors discovered that Procedure No. ISI-138, Revision 6, Paragraph 3.2 would allow data analysis personnel certified as level 1 limited and level 1 to perform reviews of data images to determine the presence of probable recordable features in accordance with



specific procedure requirements. This requirement is basically in accordance with ASME Section XI, Paragraph IWA-2300 (2)(f). However, the inspectors' review revealed that B&W did not have specific procedural requirements or written instructions that would instruct the level 1 examiners how to distinguish between images representing geometry, sound redirection, or mode conversion from images produced by real flaws. The level 1 examiner was required to record only indications representing real flaws. Therefore, the examiner would be evaluating data and making determinations that some images were not flaws. Indications evaluated as geometry etc. would not require any further review.

Discussions with the licensee and B&W revealed the following (\underline{a}) B&W did not have any certified level 1 data analysts, (\underline{b}) the requirement to use level 1 analysts had just been added to the procedure and Oconee would be the only facility where this revised procedure could have been used, (\underline{c}) the licensee had in the contract that assignment of responsibilities to individual contractor personnel shall be with the concurrence of the owner and that even if B&W had written instructions for the level 1 examiners to follow, the licensee would not have allowed level 1 examiners to analyze data.

To correct this misleading procedural reference, B&W issued Change Authorization No. ONS-91-002 to revise paragraph 3.2 of ISI-138, Revision 6 to preclude the use of level 1 personnel from performing data analysis. Since this concern had no safety significance for the Oconee facility and immediate corrective action was taken by B&W to preclude level 1 analysis from being used in the future the inspectors concluded that this issue had been resolved satisfactorily.

(2) Observation of Work and Work Activities

The inspectors observed work activities which involved the acquisition of ultrasonic data. As a result of this review portions of the following weld examinations were observed:

Weld No.	Thickness	Comments
IRPV-WR-18	12 inches	Piece 08 to 09
IRPV-WR-19	12 inches	Piece 07 to 08
IRPV-WR-13	12 inches	Piece 19 to 08 and 09 from Nozzle ID

In addition to the above weld examinations the inspectors observed the 60 degree calibration confirmations on the calibration block attached to the ARIS support ring foundation. The above examinations were observed to ensure that the approve procedures were available, were being followed by competent test examiners and the specified nondestructive examination equipment was being used and was calibrated.

(3) Analysis of Data Obtained with B&W's Accusonex Data Acquisition and Imaging System

The inspectors, concurrently with a B&W level III examiner, reviewed data for portions of the welds listed below.

Weld I.D.	Drawing No.	Comments
IRPV-WR1	ISI-OCN1-001	Circumferential Weld, Axial Scan
IRPV-WR1	ISI-OCN1-001	Circumferential Weld, Circumferential Scan
IRPV-WR12	ISI-OCN1-001	Inlet Nozzel to Shell, Circumferential Scan
IRPV-WR12A	ISI-OCN1-001	Inlet Nozzel to Shell, Circumferential Scan
IRPV-WR12C	ISI-OCN1-001	Inlet Nozzel to Shell, Circumferential Scan
IRPV-WR19	ISI-OCN1-001	Flange to Shell Weld, Axial Scan

The inspectors reviewed the data of the above weld to ensure that the examination results and evaluation of the results were being recorded as specified in the ISI procedure. The inspectors concluded that the examinations were conservatively performed and data was effectively evaluated and recorded.

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

b.

Visual Inspection of ISI Pipe Supports

The inspectors randomly selected 24 pipe supports for walkdown reinspection. The 24 pipe supports in various systems are located in the Reactor Building, Turbine Building, and Auxiliary Building. The inspection results were compared with the applicable procedure, QAL-14, Revision 12, "ISI Visual Examination, VT-3 and VT-4," dated February 14, 1991. The visual inspection included a check on configuration; defects such as distortion, cracks, bent member, weld failures induced by operation; condition of connections to supporting structures; and/or component settings. The inspectors' observations generally agreed with the information reported by the licensee's ISI examiners except for the discrepancies as noted below:

Pipe Supp	ort Walkdown	Keinspection		
Support No.	Rev. No.	Discrepancies		
-01A-0-550-H23	2	Insulation was not removed during ISI inspections.		
-01A-1-1-0-401A-H1	1			
-01A-1-1-0-401A-H40	5			
-01A-3-0-401A-H22	1	The rod located above the spring can contacted the supporting beam channels.		
-03-0-551-H58	2	The spring can setting was 10,000 lbs. The drawing and inspection sheet stated 4150 lbs.		
-03-0-551-H59	2			
-03-0-551-H65	4	Insulation was not removed during ISI inspection.		
-03-0-551-R12	4	Insulation was not removed during ISI inspection.		
-03-0-551-R13	2			
-03A-401A-DE004	2	Insulation was not removed during ISI inspection.		
-03A-401A-DE005	2			
-03A-401A-DE041	2			
-54A-0-435B-DE10	2	The anchor bolts were found by the licensee to be installed incorrectly. Problem Investigati Report (PIR) 1-091-0083 was writt for investigation of the root cau		

1-03-0-479A-H1A	0
1-03-0-479A-H9A	D3

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Table 1

Support No.	Rev. No	•		Discr	epanc	ies	
(cont'd)							
1-03-480A-H6070	5						
1-03-480A-H6178	2	4					
1-03-480A-H6177	2	·					
1-03-0-481A-H11B	D1						
1-03A-1-0-439A-DE060	1		200				
1-03A-1-0-437A-SR96	2	•	· · · ·				
1-51A-478A-H6238	2	н. <u>.</u>	· • •			-	
1-51A-0-479A-H1B	D2				•		
1-53A-0-479A-H7A	3	•					

During this refueling outage, the licensee's QC inspector identified that Support No. 1-54A-0-435B-DE10 was installed incorrectly. The 3/4" diameter anchor bolts were installed with insufficient embed length. The broken concrete caused by the improper pull-out of the original 5/8" diameter anchor bolts also had not been repaired and the required grout pad was not in place. The licensee's preliminary investigation was that this support was changed from 5/8" diameter anchor bolts to 3/4" diameter per Variation Notice during 1987 and that the modification was also incomplete because of the broken concrete. The licensee's preliminary review of the Work Request package and the QC inspection record indicated that no QC inspection had been performed. PIR 1-091-0083 was written by the licensee to investigate the root cause.

The inspectors reviewed personnel qualification documentation for 12 examiners who performed the inspection for the pipe supports listed in Table 1 above. These qualifications were reviewed in the areas of activity qualified to perform, expiration date, annual visual acuity, and color vision examination. The certification records were found to be acceptable.

3. Snubber Inspection and Testing (70370) Unit 1.

All snubbers in the safety-related systems and non-safety related systems required to protect safety-related systems in each unit are required to be operable, and 100 percent visual inspected and ten percent functionally tested during the refueling outage per Technical Specification (TS) 3.14 and 4.18. TS 4.18.1 states that snubbers located in the accessible areas can be inspected during normal operation, while those located in the inaccessible areas, are to be inspected during refueling outages.

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Procedure Nos. MP/1/A/3018/010 for hydraulic snubbers and MP/1/A/3018/019 for mechanical snubbers are used in the inaccessible areas. Procedure Nos. MP/1/A/3018/011 for hydraulic snubbers and MP/1/A/3018/020 for mechanical snubbers are used in the accessible areas. The licensee had completed visual inspection on all the snubbers during or before this refueling outage. The licensee found all snubbers inspected to be acceptable.

The NRC inspectors conducted independent visual examination verification on 23 snubbers at random. Four hydraulic and four mechanical snubbers were located in inaccessible areas. Seven hydraulic and eight mechanical snubbers were located in the accessible areas. These examinations were conducted in order to evaluate the adequacy of the examination procedures being used by the licensee and to assess the validity of the information reported by the examiners. These verification examinations generally agreed with the findings of the visual examiners except as noted below:

Table 2

Snubber Inspection

Support No.	Mechanical or Hydraulic	Accessible Area	Discrepancies/ Comments/Remedies
1-01A-0-550-R9-1	Hydraulic	No	The washer was worn by the rod at the rear bracket. A 3/8" gap was found between the spacer washer and bushing bearing on the load pin of the pipe clamp. The licensee will take appropriate corrective action.

Hydraulic

1-01A-0-550-R9-2

No

A 3/8" gap was found between the spacer washer and bushing bearing on the load pin of the pipe clamp. The licensee will take appropriate corrective action.

	Support No.	Mechanical or Hydraulic	Accessible Area	Discrepancies/ Comments/Remedies
	1-01A-0-550-R9-3	H <u>y</u> draulic	No	A 1/2" gap was found between the spacer washer and bushing
	· · ·			bearing on the load pin of the pipe clamp. The
				place. The licensee will take appropriate corrective action.
	1-01A-0-550-R9-4	Hydraulic	No	
	1-01A-0-550-DE005(A)	Mechanical	No	
	1-01A-0-550-DE005(B)	Mechanical	No	
	1-01A-0-550-DE005(C)	Mechanical	. No	
	1-01A-0-550-DE005(D)	Mechanical	No	
	1-03A-1-0-400B-SR56	Hydraulic	Yes	· · · · · · · · · · · · · · · · · · ·
	1-03A-1-0-400B-SR54	Hydraulic	Yes	
•	1-03A-1-0-400A-SR53	Hydraulic	Yes	
	1-01A-3-0-401A-R8	Hydraulic	Yes	
	1-01A-1-1-0-401A-H42	Hydraulic	Yes	
	1-01A-1-1-0-401A-H41	Hydraulic	Yes	
	1-01A-1-1-0-401A-H40	Hydraulic	Yes	
	1-03-0-551-R1	Mechanical	Yes	
	1-03-0-551-R13	Mechanical	Yes	
	1-03-0-551-R14	Mechanical	Yes	
	1-03-0-551-R15	Mechanical	Yes	•
	1-07A-400B-GC-2611	Mechanical	Yes	
	1-07A-6-0-400A-H39	Mechanical	Yes	

<u>Support No.</u> (cont'd)	Mechanical or Hydraulic	Accessible Area	Discrepancies/ Comments/Remedies
1-07A-6-0-500A-H40	Mechanical	Yes	
1-07A-6-0-400A-H41	Mechanical	Yes	

The licensee is still in the process of establishing acceptance criteria for inspection of the gap between the bushing and washer at the rod end near the rear bracket or the piston rod eye near the pipe clamps. The ISI inspection procedure OAL-14 will be revised to include the requirement for inspection of the gap and acceptance criteria.

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

Exit Interview

4.

The inspection scope and results were summarized on August 23, 1991, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection results. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.