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

Report Nos.: 50-325/90-50 and 50-324/90-50

Licensee: Carolina Power and Light Company
P. O. Box 1551
Raleigh, NC 27602

Docket Nos.: 50-325 and 50-324 License Nos.: DPR-71 and DPR-62

Facility Name: Brunswick 1 and 2

Inspection Conducted: December 3-7, 1990

Inspectors: Ronald W. Newsome 12-12-90
R. W. Newsome Date Signed

Approved by: J. J. Blake 12/12/90
J. J. Blake, Chief Date Signed
Materials and Processes Section
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope:

This routine, announced inspection was conducted on-site in the area of Inservice Inspection (ISI). The inspection included a review of the Unit 1 ISI inspection plan for this outage; reviews of nondestructive examination (NDE) procedures; observations of in-progress NDE examinations; reviews of NDE personnel qualifications; reviews of NDE material certification documentation; and, a review of completed NDE examination data.

Results:

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

All areas inspected indicated adequate control and implementation of the inservice inspection program.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*K. Altman, Manager, Regulatory Compliance
*S. Callis, On-Site-Representative, Licensing
*W. Dorman, Manager, Quality Assurance (QA)/Quality Control (QC)
*M. Foss, Supervisor, Regulatory Compliance
*K. Helme, Manager, Technical Support
*J. Holder, Manager, Outage Management and Modifications
*J. Leviner, Manager, Engineering Projects
*J. Simon, Manager, Unit 1 Operations
L. Wheatley, Supervisor, Inservice Inspection
*E. Wilson, Manager, Nuclear Systems Engineering

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

NRC Resident Inspectors

*R. Prevatte, Senior Resident Inspector
W. Levis, Resident Inspector
D. Nelson, Resident Inspector

*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Inservice Inspection

The inspector observed examination activities and reviewed documents and records as indicated below, to determine whether ISI was being conducted in accordance with applicable procedures, regulatory requirements, and licensee commitments. Most of the required ISI examinations had been completed prior to the start of this examination, therefore, few in-process examinations were observed. 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 1981. General Electric (GE) personnel are performing the NDE examinations for the licensee and a mixture of Nuclear Energy Services (NES) and Carolina Power and Light Company (CP&L) personnel are conducting the required visual examinations of pipe supports and snubbers.

a. ISI Program/Plan Review, Unit 1 (73051)

The inspector reviewed the inspection plan for this outage, 1990 Unit 1 Refueling Outage Inservice Inspection Outage Plan, Revision 0, to determine whether the program/plan had been approved by the licensee and to assure that procedures and plans had been established (written, reviewed, approved and issued) to control and accomplish the following applicable activities: organizational structure including qualifications, training, responsibilities, and duties of personnel responsible for ISI; audits including procedures, frequency, and qualification of personnel; general Quality Assurance requirements including examination reports, deviations from previously established program, material certifications, and identification of components to be covered; work and inspection procedures; control of processes including suitably controlled work conditions, special methods, and use of qualified personnel; corrective action; document control; control of examination equipment; quality records including documentation of indications and NDE findings, review of documentation, provisions to assure legibility and retrievability, and corrective action; scope of the inspection including description of areas to be examined, examination category, method of inspection, extent of examinations, and justification for any exception; definition of inspection interval and extent of examination; qualification of NDE personnel; and, controls of generation, approval, custody, storage and maintenance of NDE records.

The review of the ISI plan indicated that the plan was properly approved and contained the necessary information.

b. Review of NDE Procedures, Units 1 and 2 (73052)

(1) The inspector reviewed the procedures listed below to determine whether these procedures were consistent with regulatory requirements and licensee commitments. The procedures were also reviewed in the areas of procedure approval, requirements for qualification of NDE personnel, and compilation of required records; and, if applicable, division of responsibility between the licensee and contractor personnel if contractor personnel are involved in the ISI effort.

- GE-ADM-1001 (RO) Procedure For Performing Linearity Checks On Ultrasonic Instruments
- GE-ADM-1002 (RO) Procedure For Review Process And Analysis Of Recorded Indications
- GE-ADM-1003 (RO) Procedure For Operational Guidelines With "Smart UT" System

- GE-ADM-1005 (R0) Procedure For Zero Reference And Data Recording For Non-Destructive Examinations
- GE-UT-102 (R2) Procedure For Manual Ultrasonic Examination Of Austenitic Piping Welds For IGSCC
- GE-UT-104 (R0) Procedure For Manual Ultrasonic Planer Flaw Sizing
- GE-UT-105 (R0) Procedure For Manual Ultrasonic with FRR-BSE2-5 Examination Of Dissimilar Metal Piping Welds
- GE-UT-106 (R0) Procedure For Manual Ultrasonic FRR-BSE2-3 Examination Of Pressure Retaining Welds In Ferritic And Austenitic Piping And Components
- GE-UT-200 (R2) Procedure For Automated Ultrasonic Examination Of Austenitic Piping Welds And Components
- GE-UT-303 (R0) Procedure For Manual Ultrasonic Examination Of Nozzle Inner Radius Greater Than 10" Diameter
- GE-UT-205 (R0) Procedure For Automated Ultrasonic Examination Of Pressure Retaining Welds In Ferritic And Austenitic Piping Components
- GE-PT-100 (R0) Procedure For Color Contrast Liquid Penetrant Examination
- GE-MT-100 (R0) Procedure For Magnetic Particle Examination
- PT-91.0.52 (R6) VT-3/VT-4 Examination Of Component Supports

All procedures listed above have been reviewed during previous NRC inspections. Only current revisions were reviewed during this inspection.

(2) The inspector reviewed the Ultrasonic (UT) procedures to ascertain whether they had been reviewed and approved in accordance with the licensee's established QA procedures. The procedures were also reviewed for technical adequacy and

conformance with ASME, Section V, Article 5 and other licensee commitments/requirements in the following areas: type of apparatus used; extent of coverage of weldment; calibration requirements; search units; beam angles; DAC curves; reference level for monitoring discontinuities; method for demonstrating penetration; limits for evaluating and recording indications; recording significant indications; and, acceptance limits.

(3) The inspector reviewed the Liquid Penetrant (PT) procedure to ascertain whether it had been reviewed and approved in accordance with the licensee's established QA procedures. The procedure was also reviewed for technical adequacy and conformance with ASME, Section V, Article 6, and other licensee commitments/requirements in the following areas: specified method; penetrant material identification; penetrant materials analyzed for sulfur; penetrant materials analyzed for total halogens; surface temperature; acceptable pre-examination surface conditioning; method used for pre-examination surface cleaning; surface drying time prior to penetrant application; method of penetrant application; penetrant dwell time; method used for excess penetrant removal; surface drying prior to developer application, if applicable; type of developer; examination technique; evaluation techniques; and, procedure requalification.

(4) The inspector reviewed the Magnetic Particle (MT) procedure to ascertain whether it had been reviewed and approved in accordance with the licensee's established QA procedures. The procedure was reviewed for technical adequacy and for conformance with the ASME Code Section V, Article 7, and other licensee commitments/requirements in the following areas: examination methods; contrast of dry powder particle color with background; surface temperature; suspension medium and surface temperature requirement for wet particles; viewing conditions; examination overlap and directions; pole or prod spacing; current or lifting power (yoke); and, acceptance criteria.

(5) The inspector reviewed the Visual (VT) examination procedure to determine whether it contained sufficient instructions to assure that the following parameters were specified and controlled within the limits permitted by the applicable code, standard, or any other specification requirement: method - direct visual, remote visual or translucent visual; application - hydrostatic testing, fabrication procedure, visual examination of welds, leak testing, etc.; how visual examination is to be performed; type of surface condition available; method or implement used for surface preparation, if any; whether direct or remote viewing is used; sequence of performing examination, when applicable; data to be tabulated, if any; acceptance criteria is specified and consistent with the applicable code section or controlling specification; and, report form completion.

All procedures reviewed appeared to contain the necessary elements for conducting the specific examination.

c. Observation of Work and Work Activities, Unit 1 (73753)

The inspector observed work activities, reviewed certification records of NDE equipment and materials, and reviewed NDE personnel qualifications for personnel that had been utilized during the required ISI examinations during this outage. The observations and reviews conducted by the inspector are documented below.

(1) The inspector observed calibration activities and the in-process automated (Smart UT system) ultrasonic examinations being conducted on portions of 4 Feedwater system circumferential welds identified as 1B21N4C-6-SW1-2, 1B21N4B-3-SW1-2, N4C6-FWN4C225-3, and 1B21N4B-3-SW2-3. The examinations observed included 45 degree shear wave axial examinations of welds 1B21N4C-6-SW1-2 and 1B21N4B-3-SW2-3, the 45 degree longitudinal wave circumferential examination of weld 1B21N4B-3-SW1-2, and the 45 degree longitudinal wave axial examination of weld N4C6-FWN4C225-3. These observations were compared with the applicable procedures and the ASME B&PV Code in the following areas: availability of and compliance with approved NDE procedures; use of knowledgeable NDE personnel; use of NDE personnel qualified to the proper level; type of apparatus used; calibration requirements; search units; beam angles; DAC curves; reference level for monitoring discontinuities; method of demonstrating penetration; extent of weld/component examination coverage; limits of evaluating and recording indications; recording significant indications; and, acceptance limits.

The above observations indicated that the examinations were being conducted adequately and that the UT examiners appeared to be very knowledgeable of the capabilities of the equipment.

(2) The following listed ultrasonic equipment and materials certification records were reviewed:

Ultrasonic Instruments

Manufacturer/Model	Serial No.
KB/USK-7	27276-4946
KB/USK-7	31451-902
KB/USK-7	31451-903

Ultrasonic Couplant Batch Numbers 9088 and 8981

The inspector reviewed spectrum analysis data for the ultrasonic transducers listed below:

Serial No.	Size	Frequency
G27456	.5"	2.25 MHz
A15085	.5"	2.25 MHz
D17800	.5"	1.5 MHz
K10902	.5"	1.5 MHz
32345	.375"	2.25 MHz

Certification records for ultrasonic calibration blocks 009-BR, 46-B, 50-B, 121-B, and 31-B were reviewed by the inspector.

(3) The inspector reviewed the below listed liquid penetrant materials certification records in order to determine if the sulfur and halogen content of the material was within acceptable content limits.

Materials	Batch Number
Liquid Penetrant	89K01K
Cleaner/Remover	90H07K
Developer	89H09K

(4) The inspector reviewed documentation indicating that a 10 pound lift test had been performed on magnetic particle alternating current yoke B-311. The certification record for the lift test plate that was used to conduct the test, 10MT-002, was reviewed to confirm the weight of the test plate.

In addition to the documentation review for the magnetic particle yoke lift test performance, the inspector requested that a lift test of yoke B-311 be conducted in his presence. The lift test was satisfactorily performed using test plate 10MT-002.

A review of the magnetic particle material certification records for batch number 89A037 indicated the particles met the applicable specifications requirements.

(5) The inspector reviewed 16 personnel qualification documentation records these included CP&L and NES visual examination personnel. These personnel qualifications were reviewed in the following areas: employer's name; person certified; activity qualified to perform; current period of certification; signature of employer's designated representative; basis used for certification; and, annual visual acuity, color vision examination, and periodic recertification.

d. Data Review and Evaluation, Unit 1 (73755)

(1) Records of completed examinations for 30 UT, 15 PT, 25 MT, and 55 pipe hanger VT examinations were selected and reviewed to ascertain whether: the methods(s), 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, calibration blocks, and NDE materials (penetrants, couplants) were designated.

All of the examination reports reviewed appeared to contain the required examination information including disposition of indications, if any.

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

3. Exit Interview

The inspection scope and results were summarized on December 7, 1990, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results listed below. Although reviewed during this inspection, proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

4. Acronyms and Initialisms

ASME - American Society of Mechanical Engineers
B&PV - Boiler and Pressure Vessel
CP&L - Carolina Power and Light Company
DAC - Distance Amplitude Curve
FRR - Field Revision Request
GE - General Electric
ISI - Inservice Inspection
KB - Krautkramer/Branson
MT - Magnetic Particle
MHz - Megahertz
NDE - Nondestructive Examination
NES - Nuclear Energy Services
No. - Number
NRC - Nuclear Regulatory Commission
PT - Liquid Penetrant
QA - Quality Assurance
QC - Quality Control
R - Revision
UT - Ultrasonic
VT - Visual