



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

Report Nos.: 50-424/90-07 and 50-425/90-07

Licensee: Georgia Power Company  
 P.O. Box 1295  
 Birmingham, AL 35201

Docket Nos.: 50-424 and 50-425

License Nos.: NPF-68 and NPF-81

Facility Name: Vogtle 1 and 2

Inspection Conducted: March 12 thru 16, 1990

Inspectors: Ronald W. Newsome 3-21-90  
 R. W. Newsome Date Signed

Approved by: J. J. Blake 3/22/90  
 J. J. Blake, Chief Date Signed  
 Materials and Processes Section  
 Engineering Branch  
 Division of Reactor Safety

SUMMARY

Scope

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

Results

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

This inspection indicated that ISI nondestructive examinations were being conducted adequately. Also, documentation of examination results, personnel qualifications, and material certification records were adequate.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*J. Aufdenkampe, Manager, Technical Support
- \*H. Beacher, Senior Plant Engineer
- \*G. Bockhold, General Manager
- \*M. Horton, Manager, Engineering Support
- \*D. Hudson, Senior Plant Engineer
- \*W. Kitchens, Assistant General Manager, Operations
- \*G. McCarley, Supervisor, Independent Safety Engineering Group
- \*A. Mosbaugh, Assistant General Manager, Support
- \*R. Odem, Supervisor, Plant Engineering
- \*J. Swartzwelder, Manager, Operations
- \*J. Williams, Supervisor, Plant Engineering

Other licensee employees contacted during this inspection included engineers, security force members, technicians, and administrative personnel.

#### Other Organizations

##### Southern Company Services

- \*J. Churchwell, Senior Engineer
- \*R. Keck, ISI Project Coordinator

##### NRC Resident Inspector

- \*D. Starkey, Resident Inspector

\*Attended exit interview

### 2. Inservice Inspection

The inspector reviewed documents and records and observed activities, as 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, 1983 edition with addenda through Summer 1983. Westinghouse Electric Corporation (W) had the responsibility for the eddy current (EC) examination of steam generator (SG) tubing and utilized automated evaluation equipment for the primary data evaluation and a variety of NDE laboratory personnel to conduct the secondary, manual, data evaluations. Westinghouse also had the responsibility for the automated ultrasonic

examination of the reactor vessel welds examined during this outage and utilized the Ultrasonic Data Recording and Processing System (UDRPS) to accomplish these examinations. Southern Company Services (SCS) has the responsibility for the remainder of the ISI examination activities and is utilizing SCS and Lambert, MacGill, Thomas, Inc. (LMT) personnel to conduct the examinations.

Examinations were conducted by SCS and LMT personnel during this inspection; however, just prior to this inspection, the reactor vessel ultrasonic examinations and the eddy current examinations of the steam generator tubing had been completed. The NRC inspector reviewed the preliminary results reports for both the completed reactor vessel examinations and the steam generator tubing examinations and reviewed quality assurance documentation relative to the procedures, personnel qualifications, and equipment used to conduct both the completed and on going NDE examinations.

a. ISI Program Review, Units 1 and 2 (73051)

The inspector reviewed the following documents relating to the ISI program to determine whether the 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.

- ISI Outage Plan Second Refueling Outage (Period 1/Interval 1) with Dev. 001



- SCS/Inspection, Testing, and Engineering Policy and Procedures Manual, Revision 1

<u>Section</u>	<u>Title</u>
2-2 (R-0)	Examination And Testing Plan
2-6 (R-0)	Final Reports
3-1 (R-0)	On-Site Data Review
3-2 (R-0)	On-Site Data Control
3-4 (R-0)	Indication Notification
- AUX-H/F/V-300 (R-4) with Dev. 001	Procedure (Written Practice) for Qualification and Certification of Nondestructive Examination Personnel
- AUX-V-308 (R-1)	Preservice And Inservice Handling And Care Of Calibration Blocks Under SCS Control

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.

- GAE-ISI-153 (R0) General Requirements For The Ultrasonic Examination Of The Reactor Pressure Vessel Using UDRPS
- GAE-ISI-154 (R0) Ultrasonic Examination Requirements For Outlet Nozzles And Piping Welds From The Nozzle Bores Using UDRPS
- UT-V-407 (R1) Manual Ultrasonic Examination Of Full-Penetration Welds (.15" to .5")
- PT-V-605 (R1) Color Contrast, Solvent-Removable Liquid Penetrant Examination Procedure
- M1-V-505 (R1) Dry Powder Magnetic Particle Examination: Yoke Method
- 85052-C (R1) Visual Examination Of Component Supports And Hangers

- 84001-C (R0) Inspection Of Component Supports And Engineering Evaluation
- MRS 2.4.2 GPC-1 (R0) Digital Multi-Frequency Eddy Current Inspection Of Preservice And Inservice Heat Exchanger Tubing
- DAT-GYD-001 (R3) Data Analysis Guidelines

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 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 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 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 examination procedures to determine whether they 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.
- (6) The inspector reviewed the Eddy Current procedures for technical content relative to: multichannel examination unit, multichannel examination indication equipment is specified, examination sensitivity, method of examination, method of calibration and calibration sequence, and acceptance criteria.

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 ultrasonic (UT) examinations being conducted on 4 pressurizer safety and relief valve circumferential piping welds and 2 steam generator number 3 auxiliary feedwater circumferential piping welds. 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 inspector conducted an independent ultrasonic verification examination, using SCS equipment, on portions of 3 of the pressurizer safety and relief valve welds previously observed being examined. These examinations were conducted in order to evaluate the technical adequacy of the ultrasonic examination procedure being used by the licensee and to assess the validity of the information being reported by the ultrasonic examiners.

The verification ultrasonic examinations conducted by the inspector indicated that the procedure being used to conduct the examinations is adequate and the verification examination results compared favorably with the information being reported by the ultrasonic examiners.

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

Ultrasonic Instruments

<u>Manufacturer/Model</u>	<u>Serial No.</u>
Sonic/MK 1	14494E
KK/USK-7B	31451-1021
KB/USIP-12	29321-1082

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

<u>Serial No.</u>	<u>Size</u>	<u>Frequency</u>
C26682	1.0"	2.25 MHz
F18232	.75"	2.25 MHz
031328	.375"	2.25 MHz
125391	1.0"	2.25 MHz
125388	1.0"	2.25 MHz

Ultrasonic Couplant Batch Numbers 8767 and 8982

Ultrasonic Calibration Blocks: ISI-D-404A, ISI-D-304A, ISI-D-307A, ISI-D-319A, and ISI-D-315A

- (2) The inspector observed the in process liquid penetrant (PT) examinations of 2 circumferential piping welds. One weld was a 4" safety injection system weld, weld number 3 on sketch ISI-11201-29, and the other was a 2" main loop crossover drain line weld, weld number 1 on sketch ISI-11201-031. In addition to the 2 welds above, the inspector observed the in process examination of an integral attachment weld to a 6" safety injection system pipe. This attachment weld was designated as weld number 27 on sketch SIS-11204-039. These observations were

compared with the applicable procedure and the ASME B&PV Code in the following areas: specified method, penetrant materials identified; penetrant materials analyzed for halogens and sulfur; acceptable pre-examination surface; surface temperature; surface drying time prior to penetrant application; method of penetrant application; penetrant dwell time; method used for excess penetrant removal; surface drying prior to developing, if applicable; type of developer; examination technique; evaluation technique; and, reporting of examination results.

The NRC inspector re-evaluated the main coolant loop crossover drain line weld and the integral attachment weld following the PT examiners evaluation of the welds but prior to the developer being removed from the weld surfaces. These re-evaluations were conducted in order to determine if the evaluations performed by the PT examiner was in accordance with the applicable procedure acceptance criteria and to determine if the examination results were being reported as required. The re-evaluations conducted by the NRC inspector indicated that the proper evaluation was made by the PT examiners and that the examination results were being reported as required.

The inspector's review of the below listed liquid penetrant materials certification records indicated that the sulfur and halogen content of the material was within acceptable content limits.

<u>Materials</u>	<u>Batch Number</u>
Liquid Penetrant	87A045
Cleaner/Remover	89L01P, 89E04K
Developer	88H043

- (3) The inspector observed the in-process magnetic particle (MT) examinations of 3 steam generator number 4 auxiliary feedwater circumferential welds, numbers 40, 41, and 42. These observations were compared with the applicable procedures and the Code in the following areas: examination methods; contrast of dry powder particle color with background; surface temperature; suspension medium for wet particles, if applicable; viewing conditions; examination overlap and directions; pole or prod spacing; current or lifting power (yoke); and acceptance criteria.

During the examination of weld 40, two axial direction linear indications, one approximately 3" long and the other approximately 7" long in the pipe spool piece adjacent to the weld, were detected by the examiners. Final disposition of these indications had not been determined at the conclusion of this inspection.



The inspector conducted MT verification examinations, using SCS equipment, on portions of 2 of the welds previously observed being examined. These examinations were conducted in order to evaluate the technical adequacy of the examination procedure being used by the licensee to perform examinations and to assess the validity of the information being reported by the MT examiners.

The information reported by the MT examiners compared favorably with the verification examinations.

The inspector reviewed documentation indicating that a 10 pound lift test had been performed on magnetic particle alternating current (AC) yokes 445 and 2363. The certification record for the lift test plate that was used to conduct the tests, SCS-112, was reviewed to confirm the weight of the test plate.

A review of the magnetic particle material certification record for batch number 87A035 indicated the particles met the applicable specifications requirements.

- (4) Certification records for EC calibration standards ISI-D-806A and ISI-D-806D were reviewed for material type, correct fabrication, and artificial flaw location and size.
- (5) The inspector reviewed personnel qualification documentation for 10 UT examiners, 2 PT examiners, 2 MT examiners, 2 VT examiners, 6 EC. 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 ISI nondestructive examinations for 28 UT examinations, including the reactor vessel preliminary examination results, and 27 PT, 18 MT, and 17 VT examinations were selected and reviewed to ascertain whether: the method(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.
- (2) The inspector reviewed the preliminary EC data analysis results and a sample of associated completed records for over 400 SG tubes, approximately 100 tubes from each of four Steam Generators. The reviews were compared with the applicable

procedures and the ASME B&PV Code in the following areas: the multichannel eddy current examination equipment has been identified; material permeability has been recorded; method of examination has been recorded; and, results are consistent with acceptance criteria.

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

A random sample of current examination results were compared with historical examination results. No major discrepancies were noted during the comparison.

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

### 3. Exit Interview

The inspection scope and results were summarized on March 16, 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

AC	-	Alternating Current
ASME	-	American Society of Mechanical Engineers
B&PV	-	Boiler and Pressure Vessel
DAC	-	Distance Amplitude Curve
Dev.	-	Deviation
EC	-	Eddy Current
ISI	-	Inservice Inspection
KB	-	Krautkramer/Branson
KK	-	Krautkramer
LMT	-	Lambert, MacGill, Thomas, Inc.
MT	-	Magnetic Particle
MHz	-	Megahertz
NDE	-	Nondestructive Examination
No.	-	Number
NRC	-	Nuclear Regulatory Commission
PT	-	Liquid Penetrant
QA	-	Quality Assurance
R	-	Revision
SCS	-	Southern Company Services
SG	-	Steam Generator
UDRPS	-	Ultrasonic Data Recording and Processing System
UT	-	Ultrasonic
VT	-	Visual
W	-	Westinghouse Electric Inc.