



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

Report Nos.: 50-424/85-25 and 50-425/85-24

Licensee: Georgia Power Company
P. O. Box 4545
Atlanta, GA 30302

Docket Nos.: 50-424 and 50-425

License Nos.: CPPR-108 and CPPR-109

Facility Name: Vogtle 1 and 2

Inspection Conducted: June 17-21, 1985

Inspector:

R. W. Newsome
R. W. Newsome

June 28, 1985
Date Signed

Approved by:

B. R. Crowley for
J. J. Blake, Section Chief
Engineering Branch
Division of Reactor Safety

6/28/85
Date Signed

SUMMARY

Scope: This routine, announced inspection involved 36 inspector-hours on site in the areas of preservice inspection (PSI) of safety-related piping welds including review of procedures, observation of work, data review and evaluation, independent ultrasonic verification examinations, and licensee action on previous enforcement matters; also, general observation of construction activities, construction progress and material storage.

Results: No violations or deviations were identified.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *G. Bockhold, General Manager, Nuclear Operations (NO)
- *C. Belflower, Quality Assurance (QA) Site Manager, Operations
- *E. Groover, QA Site Manager, Construction
- *E. Meadows, Regulatory Compliance Plant Manager
- *C. Hayes, Vogtle QA Manager
- *C. Pugh, Senior Engineer
- *R. Loftin, Plant Engineer Supervisor
- *S. Lee, Plant Engineer

Other licensee employees contacted included construction craftsmen, engineers, technicians, operators, mechanics, security force members, and office personnel.

Other Organizations

J. Davis, Nondestructive Examination (NDE) Supervisor Level III,

Southern Company Services (SCS)

- *R. May, Preservice NDE Coordinator, SCS
- *A. Maze, NDE Level III, SCS

NRC Resident Inspector

W. Sanders, Senior Resident Inspector, Construction

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on June 21, 1985, with those persons indicated in the above paragraph. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

Inspector Followup Item (IFI) 50-424/85-25-01, "Procedure UT-V-406, clarification of establishing primary reference response," paragraph 6.a.(2).

Inspector Followup Item 50-424/85-25-02, "Procedure UT-V-404, applicable material," paragraph 6.a.(2).

3. Licensee Action on Previous Enforcement Matters

(Closed) Unresolved Item 50-424/85-07-01, "Determine Adequacy of Liquid Penetrant Examinations." This item concerns the possible compromise of liquid penetrant examinations which had been performed by a PSI examiner. The individual had been questioned by an NRC inspector, see report 50-424, 425/85-07, regarding liquid penetrant examination procedure requirements and during the questioning the examiner gave an incorrect answer to one of the critical elements of the examination procedure. SCS agreed to determine the adequacy of the liquid penetrant examinations which had been performed by the individual by re-examining ten percent of the welds examined by the examiner. A ten percent randomly selected sample of the welds were re-examined by a Level III SCS examiner. The results of the re-examination of these welds indicated no significant difference existed between the two examinations. The inspector reviewed supporting documentation and has no further questions regarding this item.

(Open) Unresolved Item 50-424/85-07-02, "Preservice Inspection Program Procedures." This item concerns establishment of PSI procedures to define PSI responsibilities, audits, control of materials and indoctrination/training of vendor PSI personnel. Discussions with licensee personnel indicated that procedure ADM-V-217 is in the review stage and addresses the major portions of the areas in question. Procedural requirements for the remaining portions of the questionable areas are still in the in-process stage. This item will remain open pending licensee completion and implementation of the controlling procedures and subsequent NRC review.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Independent Inspection Effort (92706) Units 1 and 2

The inspector conducted a general inspection of the Unit 1 and Unit 2 containments, auxiliary building, and material storage areas to observe construction progress and construction activities such as welding, material handling, housekeeping and storage. The inspector did not observe any questionable workmanship and discussions with mechanics indicated that they were knowledgeable of requirements. The inspector also observed that material protection, handling, and storage appeared adequate.

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

6. Preservice Inspection (PSI) (Unit 1)

The inspector examined documents, activities, and records as indicated below to determine whether PSI was being conducted in accordance with applicable procedures, regulatory requirements and licensee commitments. The applicable code for PSI is the American Society of Mechanical Engineers Boiler and

Pressure Vessel (ASME B&PV) Code, Section XI, 1980 edition with addenda through Winter 1980. Southern Company Services (SCS) has responsibility as the PSI contractor. However, nondestructive examinations have been performed by Sonic Systems International (SSI) and Lambert, MacGill, Thomas Inc. (LMT). SCS Level III examiners are performing the ultrasonic examination evaluations.

a. Review of Procedures (73052B)

- (1) The following SCS procedures were reviewed in the areas of procedure approval and qualification of NDE personnel:

<u>Procedure No.</u>	<u>Title</u>
AUX-H/F/V-300 (R2)	Procedure (Written Practice) for qualification and certification of nondestructive examination personnel.
AUX-V-306 (R0)	Measuring and recording search unit location during manual ultrasonic examinations.
AUX-V-307 (R0) with deviation 001	Preservice and inservice inspection documentation.
UT-V-404 (R0)	Manual ultrasonic examination of full-penetration welds.
UT-V-406 (R0)	Manual ultrasonic examination of cast stainless full-penetration welds.
UT-V-411 (R0)	Manual ultrasonic examination of pressure vessel welds (2 inches to 12 inches in thickness).
UT-V-455 (R0) with deviation 001	Qualification of manual ultrasonic instruments.
UT-V-465 (R0)	Ultrasonic thickness examination procedure.
MT-V-505 (R0)	Dry powder magnetic particle examination: Yoke Method.
PT-V-605 (R0) with deviation 001	Color contrast, solvent-removable liquid penetrant examination procedure.

- (2) The inspector also reviewed procedures AUX-V-306, UT-V-404, UT-V-406, UT-V-411, and UT-V-465 to ascertain whether they had been reviewed and approved in accordance with the licensee's

established QA procedures. The above procedures were reviewed for technical adequacy and conformance with ASME, Section V Article 5 and other license commitments/requirements in the below listed areas: type of apparatus used; extent of coverage of weldment; calibration requirements; search units; beam angles; DAC curves; reference level for monitoring discontinuities; method of demonstration of penetration; limits for evaluating and recording indications; recording significant indications and; acceptance limits.

While reviewing ultrasonic procedure UT-V-406, the inspector noted that in paragraph 8.6.5 subparagraph 5 the description for establishing a primary reference response could become confusing in those cases where the inside diameter (ID) notch exceeded the amplitude from the side drilled hole at 3/4T. SCS personnel agreed with this assessment and will issue a revision to the procedure which clarifies the method for establishing a primary reference response. Pending issuance of the clarification and review by NRC, this item will be identified as IFI 50-424/85-25-01, "Procedure UT-V-406, clarification of establishing primary reference response."

During the review of ultrasonic procedure UT-V-404, the inspector noted that the procedure made no distinction as to the applicable material on which the procedure could be utilized. During discussions with SCS level III personnel, the inspector pointed this fact out and in addition pointed out that the possibility existed for the inadvertent use of this procedure on cast stainless pipe which would be an unacceptable examination. SCS personnel agreed that the applicable material needed to be specified in the procedure and will issue a procedure revision stipulating the applicable material. Pending issue of the revision and review by NRC, this item will be identified as IFI 50-424/85-25-02, "Procedure UT-V-404, applicable material."

- (3) The inspector also reviewed procedure PT-V-605 to ascertain whether it had been reviewed and approved in accordance with the licensee's established QA procedures. The above procedure was reviewed for technical adequacy and conformance with ASME, Section V, Article 6, and other licensee commitments/requirements in the below listed areas: specified method; penetrant materials identified; penetrant materials analyzed for sulfur; penetrant materials analyzed for total halogens; acceptable pre-examination surface; drying time; method of penetrant application; surface temperature; solvent removal; dry surface prior to developing; type of developing; examination technique; and evaluation technique.

- (4) The inspector also reviewed procedure MT-V-505 to ascertain whether it had been reviewed and approved in accordance with the licensee's established QA procedures. The above procedure was reviewed for technical adequacy and for conformance with ASME Section V, Article 7, and other licensee commitments/requirements in the below listed areas: examination method; contrast of dry powder particle color with background and surface temperature; examination overlap and directions; pole or prod spacing; current or lifting power (yoke) and; acceptance criteria.

b. Observation of Work and Work Activities (73053B)

The inspector observed a limited amount of work activities due to the limited number of examinations being performed and the time required for independent ultrasonic verification examinations utilizing Region II equipment and personnel. The inspector reviewed certification records of equipment, materials, and NDE personnel which had been and will be utilized during the required PSI examinations. The reviews conducted by the inspector are documented below.

(1) Examiner Qualification

The inspector reviewed the qualification documentation for the below listed Southern Company Services (SCS) and Lambert, MacGill, Thomas, Inc. (LMT) examiners in the following areas: employer's name; person certified; activity qualified to perform; effective period of certification; signature of employer's designated representatives; basis used for certification; and annual visual acuity, color vision examination and periodic recertification.

Method - Level

<u>Examiner (SCS)</u>	<u>UT</u>	<u>PT</u>	<u>MT</u>	<u>RT</u>	<u>EC</u>	<u>VT</u>			
						<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
DRC	I	II	I	-	I	II	II	II	II
JMD	III	III	III	III	-	III	III	III	III
RTD	III	III	III	III	-	III	III	III	III
KJH	I	II	II	-	-	-	-	-	-
KSJ	II	II	II	III	-	-	-	-	-
TWL	I	II	II	-	-	-	-	-	-
RLM	II	II	-	-	-	-	-	-	-
AGM	III	III	III	III	-	-	-	-	-
KFW	II	II	II	-	-	-	-	-	-

Method - Level

<u>Examiner (LMT)</u>	<u>UT</u>	<u>PT</u>	<u>MT</u>	<u>RT</u>	<u>EC</u>	<u>VT</u>			
						<u>1 - 2</u>	<u>- 3</u>	<u>- 4</u>	
RDB	II	II	II	-	-	-	-	-	-
KLH	II	I	-	-	-	-	I	-	-
WRR	II	II	II	-	-	II	-	II	II
AWV	I	II	II	-	-	-	-	-	-

- (2) The inspector conducted verification ultrasonic examinations using Region II equipment on portions of the below listed Class 1 welds. The examinations were performed in order to evaluate the technical adequacy of the ultrasonic examination procedures being used to perform preservice ultrasonic examinations and to assess the validity of the information being reported by the ultrasonic examiners. The ultrasonic examination procedures used to perform the verification examinations were UT-V-404 or UT-V-406, as applicable.

<u>Weld ID</u>	<u>Description</u>	<u>System</u>
11201-002-5	Hot Leg Elbow to Nozzle	Main Coolant Loop 2
11201-005-7	Crossover Pipe to Elbow	Main Coolant Loop 1
11201-004-4	Hot Leg Pipe to Elbow	Main Coolant Loop 4
11204-024-14	6" Valve to Pipe	Safety Injection
11204-024-19	6" Pipe to Branch Connection	Safety Injection
11204-021-10	8" Pipe to Reducer	Safety Injection
11204-021-9	8" Pipe to Pipe	Safety Injection
11201-049-1	12" Branch Connection to Pipe	Residual Heat Removal

The verification ultrasonic examinations conducted by the inspector indicated that the procedures being used to conduct the preservice examinations are adequate and that the information being reported by the ultrasonic examiners compares favorably with the verification examinations. The verification examinations also indicated that a very conservative examination was being performed where procedure UT-V-404 is being utilized.

- (3) The inspector observed portions of the ultrasonic examinations indicated below. The observations were compared with the applicable procedures and the Code in the following areas: availability of and compliance with approved NDE procedure; use of knowledgeable NDE personnel; use of NDE personnel qualified to the proper level; type of apparatus used; extent of coverage of weldment; calibration requirements; search units; beam angles; DAC curves; reference level for monitoring discontinuities; method of demonstrating penetration; limits of evaluating and recording indications; recording significant indications and; acceptance limits.

<u>Weld ID</u>	<u>Description</u>
ISI-11201-006-3	Main Coolant Loop Pipe Weld Loop 2 Crossover
ISI-11201-005-4	Main Coolant Loop Pipe Weld Loop 1 Crossover

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

Ultrasonic Instruments

<u>Manufacturer / Model</u>	<u>Serial No.</u>
Nortec 131D	410
Nortec 131D	129
Nortec 131D	409
Nortec 131D	311
Nortec 131D	273
KK USL-38	210308N
KK USL-38	210349N

Ultrasonic Rompas Blocks

LMT-069
LMT-027
SCS-793381

Ultrasonic Couplant

Sonotrace 40 Batch No. 8440

Ultrasonic Transducers

<u>Size</u>	<u>Frequency</u>	<u>Serial No.</u>
.25"	2.25 MHz	G11461
.375"	2.25 MHz	C85204
1.0"	2.25 MHz	R781
.75"	2.25 MHz	978
.25"	2.25 MHz	Y2880
.25"	2.25 MHz	13231
1.0"	1.0 MHz	J31550
.75"	1.0 MHz	P979
.375"	5.0 MHz	1994
1.0"	1.0 MHz	26226
.75"	5.0 MHz	B08526
.5"	1.0 MHz	L04108
.25"	2.25 MHz	M17106

Ultrasonic Calibration Blocks

<u>Identification No.</u>	<u>Material</u>
ISI-D-331A	Cast Stainless steel
ISI-D-303A	Stainless Steel
ISI-SK-107	Cast Stainless Steel
ISI-D-304A	Stainless Steel
ISI-D-310A	Carbon Steel
ISI-D-309A	Carbon Steel

- (5) The below listed magnetic particle yokes were available for use by examiners for the performance of PSI examinations. Because the yokes were available for use, the inspector requested that the required ten pound lift test be performed on each yoke to verify it would meet the requirements of controlling documents. The lift test plate documentation was reviewed and a satisfactory left test was performed on each magnetic particle yoke.

Yoke Serial No.

LMT-003
LMT-002
SCS-6662

- (6) The inspector reviewed the below listed magnetic particle material certification records:

Batch Number

84C038
84K087

- (7) The inspector reviewed the below listed liquid penetrant materials certification records to ascertain if the sulfur and halogen content of the material was within acceptable content limits.

<u>Materials</u>	<u>Batch Number</u>
Liquid Penetrant	82G111, 84H027, 81E120, 81H114
Cleaner/Remover	84M067, 84E051, 81F076, 83B027
Developer	84M029, 84D005, 83B001, 81H085

c. PSI Data Review and Evaluation (73055)

Records of completed nondestructive 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.

Records selected for this review are listed below:

<u>Component</u>	<u>Weld ID</u>	<u>NDE Method</u>
Valve to Pipe	11204-023-W06.0	PT
Valve to Pipe	11204-023-W06.0	UT-0°, 45°, 60°
Valve to Pipe	11204-021-W01.0	PT
Valve to Pipe	11204-021-W01.0	UT-0°, 45°, 60°
Pipe to Valve	11201-049-W01.0	PT
Pipe to Valve	11201-049-W01.0	UT-0°, 45°, 60°
Elbow to Pipe	11201-036-W01.2	PT
Elbow to Pipe	11201-036-W01.2	UT-0°, 45°, 60°
Pipe to Elbow	11201-029-W01.0	PT
Pipe to Elbow	11201-029-W01.0	UT-0°, 45°, 60°
Pipe to Elbow	11201-030-W04.0	PT
Pipe to Elbow	11201-030-W04.0	UT-0°, 45°, 60°
Elbow to Pipe	11204-039-W02.2	PT
Elbow to Pipe	11204-039-W02.2	UT-0°, 45°, 60°
Valve to Pipe	11204-201-W01.0	PT
Valve to Pipe	11204-201-W01.0	UT-0°, 45°, 60°
Pipe to Valve	11301-016-W06.0	MT
Valve to Pipe	11301-016-W05.0	MT
Pipe to Valve	11301-013-W05.0	MT
Pipe to Valve	11301-014-W09.0	MT

During the review of the above listed data, the inspector requested an explanation of how SCS was determining the location and/or position of the ultrasonic indications being reported. The method being used by the SCS Level III examiners, in part, utilizes a computerized system whereby information pertaining to the ultrasonic beam path, material velocity, material thickness and profile, and ultrasonic transducer location relative to a given point are fed into a computer which then analyzes the data and produces a representative plot of the reported ultrasonic reflector relative to the weld being examined. This method of determining ultrasonic reflector location appears to be accurate within acceptable limits although the accuracy of the plotted reflector is dependent upon the examined material velocity which is not a positive factor, but can be established within a generally accepted deviation limit. In addition to the computerized plot, if the validity of the reflector location appears ambiguous, a more detailed ultrasonic re-examination of the area is performed and the final determination of the reflector location is established from all sources of information which includes weld profile measurements, taken on the pipe inside surface and outside surface for the main coolant loop piping, and on

the outside surface of all other piping in most cases. The above method for determining ultrasonic reflector location combined with a review of available radiographs of the examination area is used to make the final decision relative to reflector type and subsequent disposition. The above described method for determining reflector disposition appears relatively accurate and adequate.

Within the areas of inspection, no violations or deviations were identified.