



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

Report Nos.: 50-321/89-24 and 50-366/89-24

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

Docket Nos.: 50-321 and 50-366

License Nos.: DPR-57 and NPF-5

Facility Name: Hatch 1 and 2

Inspection Conducted: September 18-22 and 26-29, 1989

Inspector: J. L. Coley 10-30-89
Date Signed

Approved by: J. J. Blake 10/30/89
Date Signed
 J. J. Blake, Chief
 Materials and Processes Section
 Engineering Branch
 Division of Reactor Safety

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of inservice inspection with observation of work activities and review of examination procedures; Generic Letter 88-01 with review of program for dissimilar metal welds, observation of work activities, review of records, and independent ultrasonic re-examination of welds for intergranular stress corrosion cracking and pipe erosion.

Results:

During the week of September 18-22, 1989, weaknesses were observed in ultrasonic examination inspection techniques and enhanced ultrasonic procedures for Generic Letter 88-01 work activities. These weaknesses are documented in the enclosed report (Paragraph 2.A).

As a result of the ultrasonic examination technique weaknesses observed by the inspector, Georgia Power Company management was notified that the NRC had concerns about the reliability of the weld examinations. On September 26, 1989, the inspector returned to the Hatch facility to continue observing Generic Letter 88-01 ultrasonic examination activities on the reactor water cleanup system. The inspector noted significant improvements. Vendor supervision had been increased and examiners had been instructed to be aware of critical examination parameters and to be more sensitive to details. Independent ultrasonic examinations performed by the inspector also revealed excellent correlation with completed vendor examination data. However, additional

licensee actions concerning the control of NDE vendors are addressed in Inspector Followup Items 50-321, 366/89-24-01 and 50-321, 366/89-24-02 (Paragraph 2.A).

During the inspector's surveillance of work activities, the efficiency of the licensee's health physics practices became particularly noteworthy. Examples observed included the following: (1) modern, efficient monitoring equipment was used for entry to and exit from the plant, (2) respirator testing was conducted with high-tech efficient equipment, (3) radiation work permit briefings were held using photographic slides of the equipment to be worked on and area dose rates, (4) a continuously running video tape in the dress out area reminded workers of how to correctly put on and take off "anti-C" clothing, (5) respirators and finger rings were available at the entry point for quick access to radiation and contaminated areas, (6) well trained health physics personnel monitored work areas to ensure that work progressed in a safe manner, (7) oven monitors were used to monitor equipment leaving contaminated areas, (8) modern and efficient contamination monitors were used at exit points, (9) comfortable and professional looking scrub suits were required to be worn under "anti-C" clothing, (10) excellent housekeeping and security practices were observed in radiation and contamination areas, and (11) a very adequate and trained staff (both administrative and technical) assured program efficiency and worker safety.

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

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *E. Burkett, Project Engineer Supervisor
- *O. Fraser, Quality Assurance Site Manager
- *G. Goode, Manager, Engineering Support
- *J. Hammonds, Supervisor, Nuclear Safety and Compliance
- *W. Kirkley, Superintendent, Health Physics and Chemistry
- *T. Moore, Assistant General Manager, Plant Support
- *H. Nix, General Manager, Nuclear Plant
- *L. Summer, Assistant General Manager Plant Operations
- *R. Zavadoski, Manager, Health Physics and Chemistry

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

Other Organizations

Southern Company Services:

- *B. EPPs, Manager of Inspection and Technical Support
- *G. Lofthus, Level III Examiner
- *A. Maze, Nondestructive Test Supervisor

NRC Resident Inspectors

- *J. Menning, Senior Resident Inspector
- *R. Musser, Resident Inspector

*Attended exit interview

2. Inservice Inspection (ISI) - Unit 2 (73753)

The inspector observed inservice inspection work activities and reviewed examination procedures involved in these activities to ascertain whether inservice examinations of Classes 1, 2, and 3 pressure retaining components were performed in accordance with technical specifications, the applicable American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, correspondence between the Office of Nuclear Reactor Regulations (NRR) and the licensee concerning relief requests, and requirements imposed by NRC/industry initiatives.

The licensee is presently in the second interval, second period and eighth refueling outage on Unit 2. The applicable Code for the second interval inservice inspection is the 1980 Edition of the ASME B&PV Code, Section XI, with Addenda through Winter 1981.

A. Observation of Work and Work Activities

The inspector reviewed the licensee's ISI plan and schedule for the current inspection period of the inspection interval to determine the scope of work activities for this planned outage and to determine if changes to the inspection plan concerning component selection had been properly documented and approved.

As a result of the above review, the inspector selected three different methods of examination of components to audit the in-process work activities. The following methods and components were examined:

<u>Method</u>	<u>Components Selected</u>
(1) Volumetric Examination of Welding Using the Manual (A-Scan) Ultrasonic Technique	Feedwater Dissimilar Metal Welds. 2B21-1FW-12AA-8 2B21-1FW-12AA-9 2B21-1FW-12AA-10
(2) Surface Examination of Welds Using the Magnetic Particle (MT) Technique	Core Spray & High Pressure Coolant Injection Welds: 2E21-2CS-20B-TS-12-PS-1 2E21-2CS-20B-TS-12-PS-2 2E41-2HPCI-24TD-2
(3) In-Vessel Visual Examination	Upper Core Spray Sparger End Plate-270° Lower Core Spray Sparger End Plate -270° Lower Core Spray Sparger End Plate - 90° Feedwater End Brackets & End Cap Weld-45° Feedwater Sparger Nozzles-45°

For each method of examination selected above, the inspector verified that the following requirements were met:

- Approved procedures were available, being followed, and specified nondestructive examination (NDE) equipment used.
- Examination personnel were knowledgeable of examination method and operation of test equipment.
- Examination personnel with proper level of qualification and certification were performing the various examination activities, including designation of examination method/technique to be

used, equipment calibration, examination, and interpretation/evaluation acceptance of test results.

- Examination results, evaluation of the results, and any corrective actions/repairs/replacements were being recorded as specified in the ISI program and NDE procedures. Comparisons of findings were also made between indications recorded by ultrasonics during previous outages to determine any change in flaw size or position.

During the audit of feedwater dissimilar metal weld no. 2B21-1FW-12AA-8, the inspector noted that calibration block H-70, the thinnest of the two blocks, needed to examine the weld, only had a 1/2-T side drilled hole calibration reflector. The examination was being performed with a refracted longitudinal wave transducer which will not bounce off the inside diameter of the block in order that the 1/2-T side drilled hole could be used as a 6/8-T calibration reflector. This, therefore, meant that the examiner did not have a calibration reflector in the area of interest (the bottom third of the weld). The inspector questioned the examiner to determine the actual thickness of the pipe to be examined and discovered the examiner did not know the thickness of the item to be examined. The inspector then reviewed the ultrasonic examination procedure (UT-H-409 Rev. 5) and discovered that the procedure allowed a one point 1/2-T or 3/4-T side drill hole calibration reflector when using a refracted longitudinal wave transducer with no qualifying statement that the hole selected would have to be in the area of interest of the weld examination. The inspector also noted that the procedure did not require the examiner to know the weld profile or the thickness of the component being examined unless a discrepancy was found. The inspector considered this an examination weakness in the procedure because this information is needed for selection of examination techniques and equipment, and for ensuring correct standards are used for calibration, as well as for classifying an indication. As a result of the above observations, the inspector reviewed the licensee's program and examination records for all dissimilar metal welds on Units 1 and 2 to determine what effect examination weaknesses such as noted above, would have on previously performed ultrasonic examination results. The following welds were identified as having been examined with examination techniques whose affectiveness were questioned.

<u>Weld I.D.</u>	<u>Unit</u>	<u>Classification of Problems</u>
2E11-1RHR-20RS-3	2	Dissimilar Metal Weld Examined with Shear Wave Transducers
2E11-1RHR-24A-10	2	Dissimilar Metal Weld Examined with Shear Wave Transducers

<u>Weld I.D</u> (cont'd)	<u>Unit</u>	<u>Classification of Problems</u>
2E11-1RHR-24B-10	2	Dissimilar Metal Weld Examined with Shear Wave Transducers
2C11-1CRD-3-R-1	2	Calibration Block for This Weld Only had 1/2-T Side Drilled Hole Reflector, outside the Area of Interest for the Weld Examination.
Jet Pump Instrument nozzle Welds for nozzles N8A and N8B	1	Calibration Block Only had 1/2-T Side Drilled Hole Reflector Outside the Area of Interest
CRD Nozzle (N9) to Cap	1	Calibration Block Only had 1/2-T Side Drilled Hole Reflector Outside the Area of Interest
1E11-1RHR-24AR-12	1	Dissimilar Metal Weld Examined with Shear Wave Transducers
1E11-1RHR-20BD-5	1	Dissimilar Metal Weld Examined with Shear Wave Transducers

Discussions were held between Georgia Power Company Senior Management and the inspector concerning scheduling re-examinations of the above welds using adequate, but enhanced, examination techniques. Senior Georgia Power Company Management committed to re-examine the four welds on Unit 2 this outage and the five welds on Unit 1 during the next outage in March 1990.

The inspector will track this commitment with Inspector Followup Item 50-321, 366/89-24-01, "Re-examination of Generic Letter 88-01 Dissimilar Metal Welds to Enhanced Examination Techniques".

During the week of September 18-22, 1989, the inspector also observed three teams of ultrasonic examiners, including a level III examiner, calibrate and attempt to examine seven reactor water cleanup (RWCU) welds. During equipment calibration, the inspector noted that this was being done with a thin-wall calibration block and a 45° transducer with only a 1-T calibration screen. The inspector questioned the General Electric level III and the Southern Company Services level III examiners to ascertain why a 60° transducer was not used and why, when using a 45° transducer, the instrument was not calibrated to

1 1/2-T to ensure complete weld coverage. No corrective action was taken by either level III examiner and, consequently, eight examiners, including this inspector, entered a high radiation and airborne contamination area, only to find that the examinations could not be performed using the equipment as calibrated.

The inspector's review of the examination procedure used on the RWCW welds (UT-H-401 Rev. 7) revealed that it also did not require equipment selection to be based on known weld size and pipe thickness. As a result of the examination procedure weaknesses observed on the feed water system piping and the RWCW piping, discussions were held with Southern Company Services level III examiners and supervision. Southern Company Services agreed to strengthen their enhanced ultrasonic examination procedures to include these techniques. Corrective actions to be taken by Southern Company Services will be tracked by Inspector Followup Item 50-321, 366/89-24-02, "Enhancement of Generic Letter 88-01 Ultrasonic Examination Procedures".

B. Review of Inservice Examination Procedures (73052)

In addition to the ultrasonic examination procedures reviewed above, the inspector also reviewed examination procedures for other inservice inspection work, and observed and reviewed the certification and qualification records of the examiners performing observed work activities. The following procedures were reviewed for technical adequacy:

<u>Procedure No.</u>	<u>Title</u>
VT-H-750 Rev. 2	Visual Inspection of Reactor Pressure Vessel Internals
MT-H-500 Rev. 3	Dry Powder Magnetic Particle Examination

The following examiner certification and qualification records were reviewed:

<u>Examiner</u>	<u>Vendor</u>	<u>Level of Certification</u>	<u>Methods</u>
GE.D.	GE	L-III	IGSCC, PT, MT, UT & VT-1
PL.B.	GE	L-II	IGSCC, PT, MT, UT & VT-1
E.G.H.	GE	L-I	UT
E.G.H.	GE	L-II	PT & VT-1
E.P.B.	GE	L-III	VT-1, VT-2, VT-3, & VT-4
E.P.B.	GE	L-II	IGSCC MT, PT, & UT
J.L.	GE	L-II	VT-1, & VT-3
G.A.L.	SCS	L-III	IGSCC, UT, PT, MT, & VT

R.W.H.	SCS	L-III	IGSCC, UT, PT, MT, & VT
M.D.H.	SCS	L-II	MT & PT
M.D.H.	SCS	L-I	UT
T.E.W.	SCS	L-II	VT

C. Independent Examination of Piping For Erosion

During surveillance of the Torus areas, the inspector performed 360° ultrasonic measurements of various systems supply and discharge piping for erosion. These measurements were conducted using Region II equipment. No erosion was identified by the inspector.

Within the areas examined, violations or deviations were not identified.

3. Generic Letter 88-01, Work and Work Activities (Reactor Water Clean-up System Weld Examinations Outside Containment)

On June 30, 1988, Georgia Power Company responded to Generic Letter 88-01 "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping". Included in their response was a request to exclude from examinations, the non-safety-related RWCU system piping located downstream of the double isolation valves. By letter dated October 24, 1988, the NRC denied this exclusion due to lack of justification by the licensee. On April 5, 1989, Georgia Power Company met with NRR to discuss the hardship involved with inspecting these additional welds. Based on the discussion, agreement was reached to perform a sample inspection plan, with the understanding that Georgia Power Company would predetermine their flaw evaluation criteria for scope expansion prior to the outage and provide the criteria to NRR for their review. In correspondence to NRR dated June 16, 1989, Georgia Power committed to ultrasonically examine seven RWCU system welds on Unit 2. As stated in paragraph 2 above, the inspector was at the Hatch facility during the week of September 18-22, 1989, and attempted to observe the RWCU examinations efforts. After observing weaknesses in examination techniques on the feedwater dissimilar metal welds and the RWCU welds, the inspector notified Region II management. NRC management advised the inspector to return to the Region II office on September 22, 1989. Additionally, the licensee was requested to maintain scaffolding around the RWCU welds they examined so that NRC could independently conduct ultrasonic re-examinations of these welds. The licensee was notified of the inspector's concerns and of NRC management's request. On September 26th, the inspector returned to the Hatch facility prepared to observe the licensee perform the examinations on the RWCU welds or to re-examine the welds independently. The licensee informed the inspector that five four-inch welds had been completed at that time and only the two six-inch welds remained.

The inspector observed the vendor's examination of the two remaining six inch welds (2G31-3RWCU-6-D-2 and 2G31-3RWCU-6-D-3) and independently re-examined the indications noted by the vendor during this examination. In addition, two RWCU welds (2G31-3RWCU-4-D-10 and 2G31-3RWCU-4-D-11) were

independently re-examined by the inspector. No intergranular stress corrosion cracking was observed in the four welds examined by the inspector.

The results of the inspector's examination was remarkably identical to the results obtained by the ultrasonic vendor, considering different equipment and techniques were used. This re-examination effort convinced the inspector that the licensee had taken adequate corrective action to ensure the integrity of weld examinations. During the examination of weld 2G31-3RWCU-4-D-11, the inspector had noted two indications in the weld material that were apparently caused by the welder trying to seal a purge hole. These indications were stacked one over the other with very little length. However, the inspector could not be sure that they were not connected or that they were not open to corrosion buildup from the inside surface of the pipe. To ensure that these indications do not create a problem with this weld in the future, the inspector requested that the weld sample selected next outage re-look at this weld. The licensee concurred with the inspector's request. Completed examination records for all seven RWCU welds on Unit 2 and all dissimilar metal welds on Units 1 and 2 for at least two previous outages were reviewed. These examination records were also compared to the ISI program schedule, as suggested in Generic Letter 88-01, and any inconsistency was documented in paragraph 2.A. above.

Within the areas examined, violations or deviations were not identified.

4. Exit Interview

The inspection scope and results were summarized on September 29, 1989, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed, in detail, the inspection results listed below and the strengths and weaknesses discussed in the summary of this report. The first open item listed below documents the General Manager's commitment to have the contractor re-examine welds, in both units, which may not have been properly examined. The other item documents the commitment by the contractor, Southern Company Services, to upgrade the quality of their examination procedures.

(Open) Inspector Followup Item 50-321, 366/89-24-01 "Re-examination of Generic Letter 88-01 Dissimilar Metal Welds to Enhanced Inspection Techniques," (Paragraph 2.A)

(Open) Inspection Followup Item 50-321, 366/89-24-02, "Enhancement of Generic Letter 88-01 Ultrasonic Examination Procedures," (Paragraph 2.A)

Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.