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

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Report Nos.: 50-321/89-13 and 50-366/89-13

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: July 10-13, 1989

Inspector: Fred N Wright August 23, 1989
F. N. Wright Date Signed

Approved by: George D Kuzo 23 August 1989
for J. P. Potter, Chief Date Signed
Facilities Radiation Protection Section
Emergency Preparedness and Radiological
Protection Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This unannounced inspection of radiation protection activities included a review of the licensee's organization and management controls, external exposure controls, dosimetry, the as low as reasonably achievable (ALARA) program, surveys and control of radioactive material, solid radioactive waste, transportation of radioactive material, and follow-up of previously identified items.

Results:

A non-cited violation (NCV) was identified and reviewed during the inspection. The violation concerned the improper assessment of radiological hazards which resulted in improper radiation dosimetry placement (Paragraph 4). Licensee audits of radiation protection activities and radioactive waste programs, which had identified program weaknesses, appear to be a program strength. The inspector noted that the licensee was taking timely corrective actions.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*S. Bronson, Senior Plant Engineer
*R. Davis, Quality Assurance Audit Supervisor
*T. Elton, Acting Manager, Nuclear Safety Compliance
*M. Fraser, Site Manager, Quality Assurance
*W. Kirkley, Acting Manager, Health Physics and Chemistry
*M. Link, Supervisor, Health Physics and Chemistry
*B. Manning, Quality Assurance Auditor
*T. Moore, Assistant General Manager, Station Support
*H. Nicks, General Manager
*J. Payne, Senior Plant Engineer, Nuclear Safety Compliance
*J. Rigsby, Senior Health Physicist, Health Physics and Chemistry
*D. Smith, Superintendent, Health Physics and Chemistry
*L. Summer, Assistant General Manager, Operations

Other licensee employees contacted during this inspection included technicians and office personnel.

Nuclear Regulatory Commission

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

*Attended exit interview

2. Organization and Management Controls

The inspector reviewed changes made to the licensee's organization, staffing levels and lines of authority as they related to radiation protection, and verified that the changes had not adversely affected the licensee's ability to control radiation exposures or radioactivity. However, changes in the corporate health physics (HP) staff did create some documentation problems associated with classifying radioactive waste streams (see Paragraph 7).

The inspector discussed with the radiation protection supervisor, the type, methods of, and degree of interaction between plant groups. The inspector reviewed the licensee's program for self-identification of weaknesses related to the radiation protection program and the appropriateness of corrective action taken.

The inspector discussed the audit and surveillance program related to radiation protection, radioactive waste management, and transportation of

radioactive material with licensee representatives. The inspector reviewed the follow audits:

88-HP-02, Quality Assurance Audit of Health Physics and Chemistry

89-RWC-01, Quality Assurance Audit of Radiological Waste Controls Program

Findings of the two audits are discussed throughout the inspection report.

Licensee procedure 62RP-RAD-01-0S, Shipment of Radioactive Materials, was revised May 30, 1989, to address a quality control activity identified by a quality assurance (QA) auditor in finding 89-RWC-1/41. Licensee form, Cask User Check-off Sheet (form HPX-0208), required that various steps in preparing a cask for transportation of radioactive material be performed and "verified by" another individual. Licensee procedure 10AC-MGR-003-0S, Preparation Control of Procedures, defines the use of the word "verify" to mean "Independent Verification." Independent verification requires that the reviewer be qualified to make the verification of a procedural step, has not participated in the performance of the activity, and be separated from the activity by time and distance from the performance of the activity. The audit reported that the verifications documented on a licensee form HPX-0208 were performed by the first line supervisor, responsible for the activity which was not permitted by the licensees procedures. The licensee's response to the QA finding reported that it was not their intention to have independent verification applied to the radioactive waste processing procedure. The licensee revised their procedures to show that the activity was confirmed as complete, by another individual not doing the work.

No violations or deviations were identified.

3. Training and Qualifications

The inspector reviewed changes in the licensee's training program, policies, and goals relating to the radiation protection program and discussed the changes with licensee representatives. The inspector verified that the changes should not adversely affect the licensee's program.

10 CFR 19.12 requires the licensee to instruct all individuals working in or frequenting any portion of the restricted area in the health protection problems associated with exposure to radioactive material or radiation, in precautions or procedures to minimize exposures, and in the purposes and functions of protective devices employed, applicable provisions of Commission Regulations, individual responsibilities and the availability of radiation exposure data.

As part of a licensee commitment to improve the ALARA program following a licensee QA audit the inspector determined that the licensee was improving the following training activities.

The licensee plans to require mock-up training for tasks having dose projections equal to or greater than 10 person-rem when feasible. The mock-up training will try to duplicate actual field conditions as much as possible including the use of protective clothing and respirators.

Additionally, the licensee has modified the general employee training instructor lesson plans to increase emphasis on worker knowledge and understanding of ALARA principles and responsibilities.

No violations or deviations were identified.

4 External Exposure Control and Personnel Dosimetry

Technical Specification (TS) 6.8 requires the licensee to have written procedures, including the use of radiation work permits (RWPs). The inspector reviewed plant procedure 62RP-RAD-006-0S, RWP Processing, Revision 2, which provided detailed instructions on the preparation and processing of RWPs.

The inspector reviewed selected RWPs for appropriateness of the radiation protection requirements based on work scope, location, and conditions. During tours of the plant, the inspector observed the adherence of plant workers to the RWP requirements and discussed the RWP requirements with plant workers at the job site.

The inspector discussed the planning and preparation for the upcoming outage with licensee representatives. Specific areas discussed included increases in staffing, special training, equipment and supplies, HP involvement in outage planning, licensee control over HP technicians, and dose reduction methods to be employed.

10 CFR 20.203 specifies the posting, labeling and control requirements for radiation areas, high radiation areas, airborne radioactivity areas and radioactive material. Additional requirements for control of high radiation areas are contained in TS 6.12. During tours of the plant, the inspector reviewed the licensee's posting and control of radiation areas, high radiation areas, airborne radioactivity areas, contamination areas, radioactive material areas, and the labeling of radioactive material.

The inspector reviewed the following plant procedures which established the licensee's program for personnel monitoring of external dose in accordance with 10 CFR 20.202:

Administrative Control Procedure, 60AC-HPX-002-0S, Personnel Dosimetry Program, Revision 3.

Radiation Protection Procedure, 62-RP-RAD-001-0S, Dosimetry Issuance and Tracking, Revision 3.

10 CFR 20.202 requires each licensee to supply appropriate personnel monitoring equipment to specific individuals and require the use of such

equipment. During tours of the plant, the inspector observed workers wearing appropriate personnel monitoring devices.

Licensee Quality Assurance Audit 88-HP-02, Health Physics and Chemistry, reported a problem identified by the licensee's HP staff in October 1988, concerning proper placement of personnel dosimetry. On October 16 and 17, 1988, instrument workers were working on a flow indicator in the Unit 1 drywell near a reactor recirculation pump line on radiation work permit (RWP) 188-1058. RWP 188-1058 was written for electrical and calibration work in high radiation areas of the Unit 1 drywell. The RWP required whole body dosimetry for beta gamma radiation and a 0-200 milliroentgen self-reading pocket dosimeter. The HP Technicians discovered a personnel monitoring problem when the workers failed to receive the anticipated dose. A licensee survey of the area showed whole body dose rates to be 180 millirem per hour (mrem/hr) at chest level when facing the instrument, 500 mrem/hr at the chest level when facing the recirculation pump, and 500-800 mrem/hr at the head when facing the pump. A HP investigation determined that the dosimetry placement was inadequate for the dose gradient the workers were exposed to.

The HP staff corrected the exposures for the two instrument workers; assigning a dose of 650 mrem each. The licensee's dose adjustment created a administrative overexposure for one of the employees who exceeded 1000 mrem for the quarter without prior authorization. No exposures exceeded the exposure limits of 10 CFR 20. The licensee discussed the importance of proper dosimetry placement with plant HP supervisors and technicians. The licensee also revised the training program for vendor HP personnel to emphasize and test technician awareness of proper dosimetry placement.

10 CFR 20.201(b) requires a licensee to make such surveys as (1) may be necessary for the licensee to comply with the regulations of 10 CFR 20, and (2) are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present.

Licensee procedure 62RP-RAD-001-0S, Dosimetry Issuance and Tracking, Revision 2, required whole body dosimetry be placed on the part of the whole body that receives the highest exposure.

Contrary to the above, the licensee failed to adequately evaluate the extent of radiation hazards present for the instrument workers on October 16 and 17, 1988. Failure to adequately assess the actual work location dose rates resulted in improper radiation dosimetry placement. This licensee identified violation is not being cited because criteria specified in Section V.G.1 of the NRC Enforcement Policy were satisfied (NCV 50-321, 366/89-13-03).

During an NRC inspection conducted in May 1988, the inspector determined that the licensee was utilizing wrist thermoluminescent dosimeters (TLDs) instead of finger TLDs for extremity monitoring. The licensee began issuing the wrist TLDs in October 1987. The wrist and finger TLDs were different in composition and supplied by different dosimetry vendors. The

licensee reported that a comparative study comparing wrist TLD results with finger TLD results had been initiated and that the study was continuing. The inspector made the review of the study an inspector follow-up item (IFI) 50-321, 366/88-16-01. The licensee's study included 289 data points that were assembled during a six month period in which one reactor refueling occurred. The licensee's study showed that in 70 percent of the cases the finger TLD had a higher exposure value than the wrist TLD. The licensee returned to the finger TLDs for extremity monitoring in October 1988. The inspector determined through interviews with the dosimetry supervisor that the need to modify personnel exposures had been carefully considered by the licensee; however, all exposures if conservatively corrected would have been below regulatory exposure limits for extremities and no exposure corrections were made.

5. Surveys, Monitoring, and Control of Radioactive Material

10 CFR 20.201(b) requires each licensee to make or cause to be made such surveys as (1) may be necessary for the licensee to comply with the regulations and (2) are reasonable under the circumstances to evaluate the extent of radioactive hazards that may be present.

The inspector reviewed the plant procedures which established the licensee's radiological survey and monitoring program and verified that the procedures were consistent with regulations, TSs, and good HP practices.

The inspector reviewed selected records of radiation and contamination surveys performed during the period of June and July 1989, and discussed the survey results with licensee representatives. During tours of the plant, the inspector observed HP technicians performing radiation and contamination surveys.

The inspector performed independent radiation and loose surface contamination surveys in the turbine, reactor, and radwaste buildings and verified that the areas where properly posted.

The inspector discussed with the licensee the methods used to release material from the restricted area and observed technicians performing release surveys for material.

The inspector reviewed the dose curves for radioactive sources and verified that the test and calibration equipment was traceable to National Institute of Standards and Technology (NIST) standards. The inspector reviewed the calibration records for selected radiation survey instruments and discovered a potential problem with the traceability of calibration equipment. One record reviewed by the inspector did not have any method of identifying a pulser utilized in the calibration of the instrument circuit. The problem was noted a few minutes before the scheduled exit meeting and the inspector informed licensee management that a review of the licensee's radiological survey instrument calibration program would be reviewed in a future inspection as IFI 50-321/89-13-01.

No violations or deviations were identified.

6. Program for Maintaining Exposures As Low As Reasonably Achievable (ALARA)

10 CFR 20.1(c) states that persons engaged in activities under licenses issued by the NRC should make every reasonable effort to maintain radiation exposures ALARA. The recommended elements of an ALARA program are contained in Regulatory Guide 8.8, Information Relevant to Ensuring that Occupational Radiation Exposure at Nuclear Power Stations will be ALARA, and Regulatory Guide 8.10, Operating Philosophy for Maintaining Occupational Radiation Exposures ALARA.

During a radiation protection inspection conducted in November 1988, the inspector reviewed a licensee QA audit, HP Outage Activities, issued in March 1988. The inspector noted that the audit had not addressed the licensee's ALARA activities during the outage review. Licensee representatives stated that an audit of radiation protection activities was scheduled to begin later that month and that emphasis on ALARA activities would be made. A review of the licensee's scheduled audit was made IFI 50-321/88-35-02. The licensee conducted the QA Audit 88-HP-2 later that month and issued several findings related to the licensee's ALARA program. The audit reported the following findings:

- ALARA reviews of procedures, plans, design, and work practices were inadequate (finding 103).

- Evidence could not be found to demonstrate that the Plant ALARA Review Committee (PARC) is an active/effective committee, in that, the PARC meetings were informal, unplanned, poorly attended, and held in conjunction with other plant meetings, and Committee activities were poorly documented (finding 104).

- Some aspects of the ALARA program were not well understood by plant workers, in that, radiation workers did not know that ALARA was the responsibility of each individual and many of the workers were not aware of any group ALARA goals (finding 105).

- Initial dose projections for outage RWPs were inaccurate, in that, there were numerous and significant differences in projected and actual person-rem exposures (finding 106).

The licensee proposed the following corrective actions designed to strengthen the ALARA program:

- For finding 103, the licensee revised design and operation procedure review instructions to provide direction on when and how ALARA reviews should be performed.

- For finding 104, the licensee designated specific supervisors and their alternates to be PARC representatives for their work group.

- The licensee provided PARC Committee members and their alternates a new site specific ALARA training course. The Plant General Manager requested routine documented reports of PARC recommendations, and member attendance.

- Finding 105, the licensee revised initial and retraining HP general employee training to include ALARA responsibilities.

- Finding 106, the licensee made improvements in the work scope assessment methods to better define job scopes, established controls to monitor job scope growth and person-rem accumulation rates, and improve the feedback of actual job experiences to the job planners.

Following the audit, the licensee reviewed all 1988 Unit 1 outage RWPs and noted differences between the estimates and actual totals for projected man-hours and person-rem. The licensee modified its methods for establishing initial person-rem estimates for RWPs. A multi-departmental task force was formed to discuss means for improving the adequacy of man-rem estimates.

The licensee's ALARA audit increased the attention of management to improve dose projection processes, strengthen staff awareness of ALARA responsibilities and goals, and improve PARC performance. These program improvements should help strengthen the licensees ALARA program.

No violations or deviations were identified.

7. Solid Radioactive Waste

The inspector reviewed the licensee's solid radioactive waste management program, including: adequacy of implementing procedures to properly classify and characterize waste, prepare manifest, and mark packages, overall performance of the process control and quality assurance programs, and the adequacy of required records, reports, and notifications.

10 CFR 20.311 requires a licensee who transfers radioactive waste to a land disposal facility to prepare all waste so that the waste is classified in accordance with 10 CFR 61.55 and meets the waste characteristic requirements of 10 CFR 61.56. It further establishes specific requirements for conducting a quality control program.

The inspector reviewed the methods used by the licensee to assure that waste was properly classified, met the waste form and characteristic requirements of 10 CFR Part 61 and met the disposal site license conditions, and discussed the use of these methods with licensee representatives.

Licensee QA Audit Report 89-RWC-01 identified several procedural and documentation inadequacies concerning scaling factors utilized by the licensee in determining radioactive waste classification. Findings included:

- Procedures did not describe responsibilities, sampling locations, sample composition, analytical methods, and other critical steps specific to the determination of scaling factors.

- Procedures did not address re-analysis of scaling factors for changing radioactive waste streams.

- The data and subsequent analysis that provided the basis for current and previous scaling factor values could not be retrieved from the document control program.

- A radwaste shipping computer data base containing scaling factor values was not properly controlled and did not have appropriate quantitative acceptance criteria.

The licensee's corporate HP support organization recently underwent an organization merger with Southern Company Services and some supporting documentation for the licensee's current radioactive waste stream scaling factors was not readily accessible at the site. At the time of the inspection, the HP staff had reviewed past and current scaling factor analysis methodology and no problems in the licensee scaling factors were found. The licensee was developing the site radioactive waste scaling factor procedures to describe sampling techniques, locations, composition, responsibilities, analytical methods, and methods for tracking and re-analyzing the scaling factors. The licensee plans to have the procedure developed, reviewed, and verified by the end of October 1989. The training on the procedure and procedure implementation is scheduled to be completed by the end of the year. The inspector stated that a review of the licensee's radioactive waste stream scaling factors and the licensee's quality assurance evaluation of the program would be made in a future inspection as IFI 50-321/89-13-02.

10 CFR 20.311 requires that the licensee maintain a tracking system for radioactive waste shipments to verify that shipments have been received without undue delay by the intended recipient. The inspector reviewed selected manifests prepared for waste shipments made during 1989 to verify that a tracking system was being used to ensure that shipments arrived at the intended destination without undue delay.

No violations or deviations were identified.

8. Transportation of Radioactive Material

10 CFR 71.5 requires that licensees who transport licensed material outside the confines of its plant or other place of use, or who delivered licensed material to a carrier for transport, shall comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation in 49 CFR Parts 170 through 189.

10 CFR 71.12(a) permits a general license to be issued to any licensee of the Commission to transport, or to deliver to a carrier for transport, licensed material in a package for which a license, certificate of compliance (COC), or other approval has been issued by the NRC.

10 CFR 71.12(b) states that this general license applies only to a license who has a quality assurance program which satisfies the provisions of Subpart H of this regulation and has been approved by the Commission.

10 CFR 71.12(c) states that this general license applies only to a licensee who has a copy of the specific license, certificate of compliance, or other approval of the package, certificate of compliance, or other approval of the package, and has the drawings and other documents referenced in the approval relating to the use, maintenance, and preparation of the package prior to the shipment.

The licensee has an approved QA program which satisfies the provisions of 10 CFR Part 71, Subpart H. The inspector reviewed copies of the COCs for NRC approved packages utilized by the licensee to transport radioactive materials under the general license and verified that the documents and drawings referenced in the COC were available for review. The documents were controlled in the licensee's QA program. The inspector verified that the licensee had established implementing QA procedures and that the licensee was a registered user for the NRC approved packages. The inspector reviewed a licensee audit of a radioactive waste processor's QA program which verified that the vendors packages were controlled under a QA program as required.

The inspector reviewed the QA records of instruments calibrated and utilized by the vendor during package loading. The inspector verified that the maintenance and operation procedures for filling the radioactive material packages were maintained in a vendor controlled document that was reviewed and approved by the licensee's staff.

10 CFR 71.91 specifies the records that the licensee is required to maintain for each nonexempt shipment of radioactive material. The inspector reviewed selected records of radioactive material shipments made in 1989 and verified that the licensee had maintained the records required by 10 CFR 71.91. The inspector verified that the radioactive manifest reviewed had been properly completed.

The inspector reviewed plant procedures for the preparation, documentation, shipment, and receipt of radioactive material and verified that the procedures were consistent with regulations.

No violations or deviations were identified.

9. Licensee Actions on Previously Identified Inspector Findings

   a. (Closed) Violation (VIO) 50-321/88-35-05: This item concerns failure to perform an adequate radiological survey of the licensee's

contaminated machine shop following movement of contaminated material. The licensee issued a directive and counseled the HP staff on the importance of strict adherence to survey procedures. The inspector verified that all of the HP personnel received and acknowledged the survey guidance.

b. (Closed) IFI 50-321/88-35-02: This item was issued to review the ALARA aspects of planned audit during the Unit 1 refueling outage in 1988. The inspector reviewed the licensee's audit report and noted that the report had identified ALARA program weaknesses. Paragraph 6 details licensee actions taken to resolve these weaknesses.

c. (Closed) IFI 50-321, 366/88-16-01: This item concerned the placement location of TLDs for extremities monitoring. The inspector reviewed the results of a licensee study that showed extremity exposures measured with TLDs on the finger resulted in a greater exposure than TLDs located on the wrist 70 percent of the time. The licensee returned to monitoring extremity doses with TLDs located on the fingers (Paragraph 4).

d. (Closed) IFI 50-321/88-35-06: This item was issued to review the licensee's performance of estimating projecting person-rem totals for task worked during the licensee's Unit 1 refueling outage in 1988. The licensee identified problems of inaccurate exposure estimations per task in a licensee QA audit. As a result, the licensee has implemented several initiatives to improve the dose projection process.

e. (Open) IFI 50-321/88-35-03: This item concerned the need to review the licensee's proposed changes to mock-up and craft training which was beirg modified to improve worker proficiency using simulated field conditions. This item will be reviewed in a future inspection.

10. Exit Interview

The inspection scope and results were summarized on July 13, 1989, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings listed below. Although proprietary material was reviewed during the inspection, proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

Item Number	Description and Reference
50-321, 366/89-13-01	IFI - Review licensee's program for documenting radiation instrumentation calibration traceability to national standards (Paragraph 5).

50-321, 366/89-13-02	IFI - Review licensee's corrective actions, for findings identified in audits of the HP program (Paragraph 7).

Licensee management was informed that a previous violation and three IFIs discussed in Paragraph 9 were closed during this inspection.

NCV 321, 366/89-13-03 was identified and reviewed following the onsite inspection by Region II management (Paragraph 4).

During a telephone conversation on August 22, 1989, between F. N. Wright of the NRC and John Hammonds of Georgia Power Company, the licensee was informed that improper assessment of radiological hazards in the Unit 1 drywell on October 18 and 19, 1988, which resulted in improper radiation dosimetry placement was a NCV of 10 CFR 20.201(b).