



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

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Report Nos.: 50-321/88-04, 50-366/88-04

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

Docket Nos.: 50-321, 50-366

License Nos.: DPR-57, NPF-5

Facility Name: Hatch

Inspection Conducted: January 26-29, 1988

Inspector: for Ray C. Weddington  
C. H. Bassett

2/10/88  
Date Signed

Accompanying Personnel: R. B. Shortridge

Approved by: for Ray C. Weddington  
C. M. Hosey, Section Chief  
Division of Radiation Safety and Safeguards

2/10/88  
Date Signed

SUMMARY

Scope: This routine, unannounced inspection was conducted in the area of radiation protection aspects of the Unit 2 outage including: planning and preparation; training and qualification; external exposure control; internal exposure control; control of radioactive materials and contamination, surveys, and monitoring; the program to maintain exposures as low as reasonably achievable (ALARA); followup on previous enforcement items and followup on open items.

Results: No violations or deviations were identified.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*D. Hopper, Supervisor, Corporate Radiological Safety
- \*M. Link, Supervisor, Health Physics Operations
- B. Morris, Dosimetry Foreman
- J. Reddick, Supervisor, Health Physics Support
- M. Rigsby, Health Physicist
- \*D. Smith, Superintendent, Health Physics
- \*R. Zavadoski, Manager, Health Physics and Chemistry

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

#### Nuclear Regulatory Commission

- \*P. Holmes-Ray, Senior Resident Inspector
- \*J. Menning, Resident Inspector

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on January 29, 1988, with those persons indicated in Paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector during this inspection.

Note: A list of abbreviations used in this report is contained in Paragraph 6.

### 3. Licensee Action on Previous Enforcement Matters (92702)

- a. (Closed) Violation 321/87-27-01, Failure to take suitable measurements to detect and evaluate airborne radioactivity during work conducted on contaminated material.

The licensee response dated December 15, 1987, was considered acceptable by Region II. The inspector reviewed the licensee's Departmental Directive HPC-87-26 which was issued to all Health Physics (HP) personnel and the revisions made to the HP Contractor qualification test. The inspector verified that corrective actions stated in the licensee's response have been implemented. In addition, the inspector noted that the air sample port in the wall of

the Kelly Building had been removed and that air samples would have to be taken inside the enclosure and would therefore be more representative of the breathing zone of workers.

- b. (Closed) Violation 321/87-27-02, Failure to control and account for Special Nuclear Material (SNM) at the plant site.

In a response to this violation dated December 15, 1987, the licensee stated that the drums containing the SNM had been returned to the refueling floor, the inventory had been verified and the incident had been discussed with Refueling Floor Coordinators and their management. The inspector reviewed these actions and verified they had been completed.

- c. (Closed) Violation 321/87-27-03, Failure to comply with a disposal site license condition regarding free standing liquid in a waste shipment.

The licensee's response dated December 15, 1987, stated that the initial problem had been corrected, other shipments were reworked to verify no free standing liquid was present and that Procedure 62HI-OCB-056-OS, Operation of Waste Separation and Temporary Storage Facility, would be revised. The inspector verified that the corrective actions had been implemented and were completed.

#### 4. Occupational Exposure During Extended Outages (83729)

- a. Planning and Preparation

The present HP organization, staffing levels and lines of authority as related to outage radiation protection activities were discussed with licensee representatives. The organizational responsibility and control of the contractor HP technicians used during the outage was also discussed. After training had been completed and verified, contractor HP technicians were integrated into the licensee's work force and were assigned jobs commensurate with their experience and qualifications. Licensee personnel were placed in supervisory roles over the contract technicians to assure compliance with established procedures and quality of work.

The inspector reviewed the duties of one member of the HP organization who had the primary responsibility of planning and preparing for outages. Some of this individual's responsibilities involved reviewing the overall scope of the outage with other engineers and supervisory personnel to determine where problems might arise and planning ways to overcome them. The person also reviewed non-routine jobs to give advice on HP requirements and restrictions such as shielding that may be needed, containments that could be used and other HP considerations. In addition, the individual was responsible for ensuring that adequate supplies of items such as

protective clothing (PCs), respirators, temporary shielding, hoses, and so forth were on hand to support outage work.

Control of contractor HP technicians and planning and preparations for the outage appeared to be adequate. Health Physics personnel were apparently involved early enough in the planning stages to allow for adequate job review and input.

No violations or deviations were identified.

b. Training and Qualification (83723)

(1) General Employee Training (GET)

The licensee is required by 10 CFR 19.12 to provide basic radiation protection training to workers. Regulatory Guides 8.13, 8.27, and 8.29 outline topics that should be included in such training. Chapters 12 and 13 of the Final Safety Analysis Report (FSAR) also contain further commitments regarding training.

The inspector discussed the radiation protection aspects of GET with licensee representatives and selectively reviewed training records of personnel from various plant organizations. To gain access to work in radiologically controlled areas (RCA), a student was given 16 hours of instruction in radiation protection, emergencies, respiratory protection, 4 hours of practical factors demonstration, and must successfully pass an examination with a score of 70 percent. Each employee was required to pass a 4 hour requalification course annually to maintain skills in radiation protection and retain authorization to work in radiologically controlled areas. Practical factors demonstration was not required for requalification.

(2) Health Physics Technician Training and Qualification

Technical Specification (TS) 6.3.1 requires that member of the facility staff meet or exceed the minimum qualifications of ANSI N18.1-1971 for comparable positions. Paragraph 4.5.2 of ANSI N18.1 states that technicians in responsible positions are to have a minimum of 2 years of working experience in their specialty.

The inspector discussed the technician training program with licensee representatives. HP technicians received 16 weeks of basic radiation protection training in academics, job coverage, plant systems, and respiratory protection. In addition, 40 hours of instruction were given annually in continuing training in subjects, such as, detection and control of hot particles, coverage of radiography, information notices,

operations and maintenance reminders, and significant event reports.

The licensee stated that the Institute of Nuclear Power Operations (INPO) had extended accreditation for the health physics training program at Hatch in April 1986.

(3) Contractor Health Physics Training and Qualification

During outage periods, contractor personnel were hired to augment the HP staff to provide HP job coverage. Contract HP technicians received 2 days of site specific training and were required to pass an examination that tested their qualifications as a health physicist and their knowledge of site specific requirements. Senior technicians were required to attain a grade of 80 percent and junior technicians a grade of 70 percent on the site specific examination.

No violations or deviations were identified.

c. External Exposure Control and Dosimetry (83724)

(1) Personnel Monitoring Devices

10 CFR 20.202 requires each licensee to supply appropriate personnel monitoring devices to specific individuals and require the use of such equipment. During tours of the Unit 2 reactor building the inspector observed the use of thermoluminescent dosimeters (TLDs) and self-reading pocket dosimeters (SRPDs). It was noted that workers typically placed their SRPDs inside their protective clothing. The inspector discussed with the licensee the potential for workers contaminating themselves if they reach inside their protective clothing to read their SRPD while checking on their exposure. Licensee representatives stated that all monitored plant personnel have assigned SRPDs and that the average SRPD reading per RWP entry is less than approximately 20 millirem. Therefore, the importance of workers checking their SRPDs while dressed in protective clothing is not very great. When SRPDs are required by RWP, the nature of the work is such that health physics personnel are also present and available to monitor worker exposures. The inspector observed that this still appeared to be a poor practice and it will be reviewed during subsequent inspections.

(2) Radiologically Controlled Areas

10 CFR 20.203 specifies posting and control requirements for radiation areas, high radiation areas, airborne radioactivity areas, and radioactive material areas. During plant tours, the inspector observed the licensee's posting and control of radiation, high radiation, airborne radioactivity and

radioactive material areas. The inspector also verified that various high radiation areas in the auxiliary building were being maintained locked as required.

(3) Personnel Exposure Control

The licensee is required by 10 CFR 20.101 and 20.102 to maintain workers' doses below specified levels. The inspector reviewed selected occupational exposure histories of contractor and licensee personnel and verified that the licensee was requiring a completed NRC Form 4 or its equivalent to be maintained on file prior to permitting an individual to exceed the exposure limits specified in 10 CFR 20.201(b). The inspector also reviewed the NRC Form 5 equivalent printout for the plant and determined that the radiation exposures recorded were within the quarterly limits specified in 10 CFR 20.101.

No violations or deviations were identified.

d. Internal Exposure Control and Assessment (83725)

(1) Engineering Controls

10 CFR 20.103(b)(1) requires that the licensee use process or other engineering controls to the extent practicable to limit concentrations of radioactive materials in the air to levels below those which delimit an airborne radioactivity as defined in 20.103(d)(1)(ii).

During tours of the Unit 2 Reactor Building and the RCA, the inspector observed various engineering controls employed to limit concentrations of radioactive materials in air. These included construction of tents with associated high efficiency particulate air (HEPA) filters and the use of auxiliary ventilation ducting.

(2) Respiratory Protection Program

10 CFR 20.103(b) requires that, when it is impracticable to apply process or engineering controls to limit concentrations of radioactive materials in air below 25% of the concentrations specified in Appendix B, Table 1, Column 1, other precautionary measures should be used to maintain the intake of radioactive material by any individual within seven consecutive days as far below 40 maximum permissible concentration-hours (MPC-hrs) as is reasonably achievable.

Through records review, observations and discussions with licensee representatives, the inspector evaluated the respiratory protection program including training, fit testing, MPC-hr assignments, quality of breathing air and issue, use,



decontamination and storage of respirators. Review of the MPC-hr assignments for selected individuals revealed that all exposures were well under the 40 MPC-hr per week control level.

(3) Air Sampling and Bioassays

10 CFR 20.103 establishes the limits for exposure of individuals to concentrations of radioactive materials in air in restricted areas. Section 20.103 also requires that suitable measurements of concentrations of radioactive material in air be performed to detect and evaluate the airborne radioactivity in restricted areas and that appropriate bioassays be performed to detect and assess individual intakes of radioactivity.

The inspector reviewed the results of air samples taken during the outage. The air sample log indicated that airborne radioactivity had been well above 25% of the maximum permissible concentration (MPC) of radionuclides specified in 10 CFR Part 20, Appendix B, Table 1, Column 1 during the first three days of the outage. The licensee indicated that this had occurred mainly due to the automatic isolation of the main steam isolation valves (MSIV) on January 13, 1988, due to a high radiation indication on one of the monitors on the main steam line. This kept the reactor at pressure for several hours longer than usual which in turn caused more leakage through back seated valves in the reactor coolant system. The licensee indicated that the increased leakage caused the unusually high airborne levels. The highest airborne levels were noted in the steam chase with concentrations to 58 MPC of iodine and 48 MPC of particulate activity. The drywell had total activity up to 21 MPC during the same time period and the Reactor Building a total of 25 MPC.

Because of these high airborne levels, the licensee stopped all outage work except for work on the main steam line monitors (to relieve the pressure on the system) and work to bring the reactor water clean-up (RWCU) system back in service. This work was accomplished with full health physics coverage and workers wearing full protective clothing plus plastic suits and self-contained breathing apparatus (SCBA). Breathing air lines were also used in support of the work on the monitors and the RWCU system. By the next day, January 14, airborne concentrations had dropped below 25% MPC and decontamination of the Reactor Building and drywell was initiated. By January 15, decontamination had proceeded sufficiently to allow work to resume.

A representative sample of all personnel known to have been in the Reactor Building during the time the high airborne levels were present were given whole body counts. These included personnel who had been present when the levels were first noted

as well as all personnel who later made entries into high airborne radioactivity areas using SCBAs or air line respirators where total activity exceeded 5 MPC. Of the 28 people monitored, none showed any detectable internal deposition of radioactivity.

On January 20, during filling of the reactor vessel and transfer canal, airborne levels again exceeded 25% MPC for a period of time and approximately 40 more people who had been working on the refueling floor were given WBCs. By this time employee concern had increased due to the number of people counted and the difference sometimes noted in the results given by the chair whole body counter versus the standup whole body counter.

In reviewing the WBC results, the inspector noted that there was no set procedure for performing a WBC for those suspected of having external contamination or ingested radioactive material. It was noted that some individuals were counted while wearing their work clothes while others were required to shower and dress in paper coveralls before being counted. This variation in the counting technique may have contributed to the disparity in the results obtained in addition to the inherent differences in the two counting systems. One individual requested to be counted in the standup counter after being found with no detectable activity in the chair counter. After the standup counter results indicated a possible internal contamination, he was recounted in the chair counter which then indicated 4% maximum permissible organ burden (MPOB) of iodine-131 (I-131) in the thyroid. The person then became concerned. When showering and other decontamination methods failed to remove the I-131, the individual felt he had ingested radioactive material while members of the HP staff felt it was external contamination, possibly on the hair of the upper torso. The worker was given whole body counts over the next several days which continued to indicate low level internal radioactivity. The licensee had not yet completed their investigation of this matter. The inspector indicated that the development of a procedure to be used to perform a whole body count in cases of possible ingestion as well as the licensee's final evaluation of the workers exposure would be reviewed during subsequent inspections (Inspector Followup Item 50-321, 366/88-04-01).

No violations or deviations were identified.

- e. Control of Radioactive Material and Contamination, Surveys, and Monitoring (83726)

The licensee is required by 10 CFR 20.201(b), 20.401, 20.403 to perform surveys and to maintain records of such surveys necessary to show compliance with regulatory limits. Survey methods and instrumentation are outlined in the FSAR, Chapter 12, while TS 6.11



requires adherence to written procedures. Radiological control procedures further delineate survey methods and frequencies.

(1) Contamination Surveys

While touring the facility, the inspector observed workers exiting the RCA and the movement of material from the RCA to clean areas to determine if adequate surveys were being performed by workers and if adequate direct and smearable contamination surveys were performed on materials. All personnel and material surveys appeared to be adequate. The inspector also examined selected records of personnel contaminations that occurred during 1987 and, through records review and discussions with licensee representatives, determined that the contamination had been removed and the skin dose calculations were adequate. Selected individual's exposure histories were checked to verify that the calculated skin dose had been assigned as indicated.

(2) Survey Results

During plant tours, the inspector examined radiation level and contamination survey results posted outside selected areas and rooms. The inspector performed independent radiation level surveys of selected areas using NRC equipment and compared them with licensee survey results. The inspector also examined licensee radiation protection instrumentation and verified that the calibration stickers were current.

(3) Caution Signs, Labels and Controls

10 CFR 20.203(f) requires that each container of licensed radioactive material bear a durable, clearly visible label identifying the contents when quantities of radioactive material exceed those specified in Appendix C. During plant tours, the inspector verified that containers of radioactive material were labeled as required and that proper controls were established.

No violations or deviations were identified.

f. Program for Maintaining Exposures As Low As Reasonably Achievable (ALARA) (83728)

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 exposure ALARA. The recommended elements of an ALARA program were contained in Regulatory Guides 8.8, Information Relevant to Ensuring that Occupational Radiation Exposure at Nuclear Power Stations will be ALARA, and 8.10, Operating Philosophy for Maintaining Occupational Radiation Exposures ALARA.

(1) ALARA Program

The inspector discussed the ALARA program with licensee representatives. During calendar year 1987, 816 man-rem were expended. The 1988 man-rem goal was 1,060 with approximately 101 man-rem expended as of January 28. The annual man-rem goal was established at the station based on specific jobs and outage work scope. The inspector reviewed selected ALARA work packages containing job history, prejob briefing attendance sheet and items discussed, and post job ALARA reviews. No deficiencies were noted.

The licensee had an ALARA suggestion and problem reporting system, however, the inspector noted that participation by employees was historically poor and was currently averaging only about one suggestion every two and one half months. The licensee did not have an incentive program to promote employee interest in the suggestion program. Licensee representatives stated that they receive many suggestions from workers, but most are handled informally. Also based on the current low station exposure, they saw no need to have an incentives program.

(2) Outage Activities

The licensee had just commenced the seventh refueling of Unit 2 reactor. The outage was scheduled for 65 days with an outage goal of 358.15 man-rem. The licensee had expended approximately 80 man-rem in the first 16 days of the outage.

(3) Personnel Contaminations

As of January 28, there had been 92 skin and clothing contaminations. In 1986 and 1987 there were 1,850 and 588 skin and clothing contaminations respectively. The downward trend in personnel contaminations was attributed primarily to the deletion of reporting noble gas contaminations.

No violations or deviations were identified.

5. Licensee Actions on Previously Identified Inspection Findings (92701)

- a. (Open) Inspector Followup Item (IFI) 321/87-04-01, Review revised procedure for skin dose calculations.

A previous inspection had identified that the licensee was planning to revise the procedure used to calculate skin dose. Licensee representatives had indicated that they planned to revise, review and implement the procedure before the current Unit 2 refueling outage. However, due to extensive changes and development of a new section in their procedure dealing exclusively with hot particles, the revision

had been completed but not approved at the time of the inspection. This item will be reviewed during a subsequent inspection.

- b. (Open) IFI 321/87-27-04, Revision of the program to control hot particles.

During a previous inspection it had been noted that priority had been given to the initiation and implementation of formal procedures dealing with a hot particle monitoring program due to recent developments in the industry. At the time of the inspection, the procedures had not been fully reviewed or implemented. The inspector did note, during tours of the facility, the use of double sets of protective clothing (PCs) in areas of high contamination. In addition, the licensee had evaluated the contract laundry residual contamination limits for re-usable protective clothing and found them to be acceptable.

- c. (Closed) IFI 321/87-27-05, Revision of Plant Procedure 42-FH-ENG-014-02, Fuel Movement Operations, Rev. 1, December 5, 1985, and Control of the Drywell During Fuel Movement.

The inspector verified that Procedure 42-FH-ENG-014-02, Fuel Movement Operation, Rev. 1, December 5, 1985, had been revised as the licensee had indicated. The procedure was revised effective January 18, 1988, and was issued with a new Document number, 42-FH-ERP-014-0S, Rev. 0, while retaining the title of the previous procedure.

During a tour of the Unit 2 drywell, the inspector noted that the entrance to areas above the 156' elevation had been roped off and posted with signs indicating no entry above that elevation during fuel movement. The use of a remote ion chamber located above the 156' elevation to monitor drywell radiation levels during spent fuel movement was also noted.

## 6. List of Abbreviations

ALARA	As Low As Reasonably Achievable
FSAR	Final Safety Analysis Report
GET	General Employee Training
HEPA	High Efficiency Particulate Airborne (filter)
HP	Health Physics
INPO	Institute for Nuclear Power Operations
MPC	Maximum Permissible Concentration
MPC-hr	Maximum Permissible Concentration-hour
MPOB	Maximum Permissible Organ Burden
MSIV	Main Steam Isolation Valve
PCs	Protective Clothing
RCA	Radiation Control Area
RWCU	Reactor Water Cleanup System
SCBA	Self-contained Breathing Apparatus

SNM	Special Nuclear Material
SRPD	Self-Reading Pocket Dosimeter
TLD	Thermoluminescent Dosimeter
TS	Technical Specification
WBC	Whole Body Count