



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

Report Nos.: 50-348/88-02, 50-364/88-02

Licensee: Alabama Power Company
600 North 18th Street
Birmingham, AL 35291

Docket Nos.: 50-348, 50-364

License Nos.: NPF-2, NPF-8

Facility: Farley 1 and 2

Inspection Conducted: January 4-6, 1988

Inspector: T. R. Collins

2/3/88
Date Signed

Accompanying Personnel: R. B. Shortridge

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

2/3/88
Date Signed

SUMMARY

Scope: This was a special, announced inspection to review the circumstances surrounding the unauthorized entry of licensee personnel into a high radiation area.

Results: Four violations were identified: (1) failure to adequately control access to a high radiation area, (2) failure to follow procedures, (3) failure to perform an adequate survey, and (4) failure to adequately instruct individuals working in or frequenting a restricted area.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *P. Farnsworth, Radwaste Supervisor
- *O. Graves, Health Physics Supervisor
- *M. Maddox, Training Supervisor
- *W. Mitchell, Health Physics and Radwaste Supervisor
- *D. Morey, Assistant General Manager, Operations
- *C. Nesbitt, Technical Superintendent
- *J. Ritterholtz, Supervisor, Safety Audit Engineering Review
- *B. Patton, Plant Health Physicist
- *J. Walden, Lead Auditor
- *L. Ward, Maintenance Manager
- *L. Williams, Training Manager
- *J. Woodard, General Manager

NRC Resident Inspectors

- *W. Bradford
- *V. Miller

*Attended exit interview

2. Exit Interview (30703)

The inspection scope and findings were summarized on January 6, 1988, with those persons indicated in Paragraph 1 above. Four violations were discussed in detail: (1) failure to adequately control access to a high radiation area, (2) failure of personnel to follow RWP requirements to wear high range dosimeters in a high radiation/exclusion area, (3) failure to perform a radiation survey to determine the extent of radiation hazards in the high radiation/exclusion area, and (4) failure to adequately instruct individuals of the limitations and precautions for working in or frequenting a restricted area. The licensee acknowledged the inspector findings. However, the Plant Manager took exception to all findings. The Plant Manager also stated the individual carelessly entered the exclusion area to perform work and failed to comply with licensee controls which placed the responsibility for the action on the individual and not the licensee. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector during this inspection.

3. Onsite Followup of the Unauthorized Entry to an Exclusion Area (93702)

a. Description of Events

On December 28, 1987, a licensee contractor was providing decontamination support following the fifth refueling outage. The

Radwaste Supervisor had provided a work list of rooms requiring decontamination by the contract decon personnel to the Waste and Decon Foreman. Of the ten rooms on the list, three rooms were known by the licensee to be high radiation areas. However, these three rooms were not identified on the list as high radiation areas. The areas on the list were not identified as requiring special radiation work permits (RWPs) or radiological controls and precautions.

The Waste and Decon Foreman gave the list of rooms requiring decontamination to a contract decontamination foreman and issued him a set of keys that would unlock doors to these areas. A health physics (HP) technician was assigned to support the contract decontamination foreman and his crew during the scheduled decontamination activities.

One of the rooms on the list which contained high radiation areas was Room 450 in the Unit 1 Auxiliary Building. Room 450 provided the only access to Room 449, where the Spent Fuel Pool Demineralizer (SFPD) was located. Room 449 and part of Room 450 were exclusion areas, defined by the licensee as areas having radiation fields greater than 1 Rem per hour (R/hr). The total exclusion area composed of Room 449 and part of Room 450 was barricaded by three yellow and magenta ropes and a flashing red light located at the exclusion area boundary in Room 450. Radiation fields in Room 449 ranged from 5 R/hr to 240 R/hr, with general area radiation fields of approximately 30 R/hr. Radiation fields from the exclusion area boundary in Room 450 to the opening of Room 449 ranged from 0.16 to 5 R/hr.

The contract decontamination foreman unlocked the door to Room 450 and left the room unattended. Moments later, the HP technician entered the room and noted the exclusion area while performing surveys. The technician left the room unlocked and unattended. Subsequently, contract decontamination personnel entered the room to perform decontamination activities. One worker crossed the exclusion area boundary and entered Room 449 and one worker stayed in the high radiation area on the front part of Room 450. The laborer who entered the exclusion area, Room 449, worked in an area approximately five feet from the SFP demineralizer. After approximately five minutes, the laborer observed his low range dosimeter was offscale and immediately exited the room and reported to a HP technician.

b. Licensee Corrective Actions

Licensee temporary corrective actions were as follows: (1) processed the individual's TLD and assessed his exposure during the incident as 455 millirems; (2) the licensee verified that the individual who remained in the front part of Room 450 did not receive any significant exposure to radiation; (3) the workers were interviewed by licensee management and statements concerning the event were obtained from the two individuals who entered the room and the

involved HP technician; (4) a closed circuit TV camera was installed to preclude the need for operations personnel to enter Room 450 on a routine basis; (5) the door to Room 450/449 in Unit 1 and Room 450/449 in Unit 2 were locked and established as exclusion areas; (6) Operations hold tags were placed on doors of exclusion areas so that entry would require a written clearance (approval) to remove the hold tags and approval by HP supervision and the shift foreman on duty.

Licensee permanent corrective actions will be as follows: (1) The contract decontamination foreman and the individuals entering the exclusion area and high radiation area would be retrained and counseled by their company's supervision; (2) wherever possible, exclusion area boundaries will be expanded such that access can be controlled by a locked door; (3) keys to exclusion area doors will be removed from all key rings except those of Shift Supervisors (for the purpose of Control Room evacuation); (4) the system for the issuance of exclusion area keys will be segregated from that for issuance of other high radiation area keys; (5) new locks will be installed on exclusion area doors such that each door will have a specific key; and (6) consideration will be given to increased health physics coverage for contractor crews.

c. Inspection Results

The inspectors discussed this event with licensee representatives and interviewed personnel who had been associated with the event. The inspectors also reviewed records assembled by the licensee as part of their investigation.

The inspectors reviewed a special survey of the spent fuel pool demineralizer Room 450/449 performed after the event to determine if the laborer was in a non-uniform radiation field and if multiple dosimetry was required. The contact radiation levels on the SFPD tank were 5 R/hr at the bottom, 240 R/hr at the head level and approximately 150 R/hr at 18" from the surface of the tank. This survey was conducted on the side of the SFPD where the individual was working. The inspectors concluded that the worker was in a relatively uniform field of radiation and that the dosimetry provided was appropriate.

The inspectors interviewed the contract decontamination foreman and two laborers who entered Room 450/449 and determined: (1) that the work was performed on a routine RWP in lieu of a required special radiation work permit; (2) a pre-job briefing was not held and as a result workers were not aware that the work would be performed in an exclusion area; (3) they were not aware that the flashing red light and triple barricade of yellow magenta rope designated an area requiring special precautions; (4) the contract waste and decon foreman was not sufficiently trained in radiological control precautions and limitations for work in high radiation and exclusion

areas to have control of keys to these areas; (5) the workers and foreman were not aware of the contamination or radiation levels of the areas in which they were working; (6) they were not aware that the RWP under which they were working required a high range dosimeter for entry; and (7) the contract decontamination worker who received 455 millirems during the incident exceeded the licensee's administrative dose limit of 300 millirems per week.

The inspectors interviewed the HP technician involved in this incident and determined the following: (1) he did not receive a briefing upon assignment to support the decontamination activities; (2) he was not aware of the radiation levels in the SFPD (Exclusion Area) Room 449; (3) he was not aware that Room 450 contained an exclusion area until he entered Room 450/449 to conduct a survey.

The inspector interviewed the Waste and Decon Supervisor who issued the keys to the contract decontamination foreman. Based on this interview the inspector concluded that the supervisor was not aware that any of the ten rooms listed to be decontaminated contained high radiation or exclusion areas, or that the waste and decon foreman should contact the health physics office prior to work in these areas for a job briefing on the radiological conditions present.

The inspector concluded after discussions and interviews with licensee personnel and review of the licensee's General Employee Training (GET) program that; (1) the individuals that entered Room 450/449 failed to read and comply with the RWP requirements under which they were working; (2) the licensee failed to properly train personnel in the limitations and precautions of an exclusion area; (3) personnel were allowed to enter an exclusion area without the performance of an adequate survey to evaluate the extent of the hazards that were present; and (4) the licensee failed to provide positive access control to a high radiation area to prevent unauthorized entry.

d. Regulatory Implications

- (1) Technical Specification 6.12.1 requires that each high radiation area in which the intensity is greater than 100 mrem/hr but less than 1,000 mrem/hr shall be controlled by requiring the issuance of a RWP and be accompanied by one or more of the following:
 - (a) a radiation monitoring device that continuously indicates dose in the area,
 - (b) a radiation monitoring device that continuously integrates dose and alarms at a pre-set point; or
 - (c) a health physics technician with a radiation monitoring device that provides positive control over activities in the area and provides surveillance and surveys at the frequency designated by the facility health physics supervisor.

Although an HP technician was assigned to the decontamination effort, he did not provide positive control over activities in

the area. On December 28, 1987, licensee contract decontamination workers entered Rooms 450/449 and failed to have one of the above listed radiation monitoring devices on their person or have a health physics technician provide positive control over activities in this area. Failure of personnel entering a high radiation area to have the required radiation monitoring device or be accompanied by a health physics technician was identified as an apparent violation of TS 6.12 (50-348, 364/88-02-01).

- (2) Technical Specification 6.12.2 requires that areas accessible to personnel with radiation areas such that a major portion of the body could receive in one hour a dose greater than 1,000 mrem/hr shall be provided with locked doors to prevent unauthorized entry.

On December 28, 1987, a HP technician was assigned to support decontamination of areas in the auxiliary building. The contract decontamination foreman requested the HP technician to perform radiation surveys of Rooms 445, 448, and 450. Upon entering Room 450/449, a high radiation/exclusion area, the HP technician observed that the door to the room was unlocked and unattended. Radiation levels within Room 450/449 were measured to be approximately 150 R/hr at 18" from the SFPD. The licensee elected to control access to this area by the use of a three rope barricade, a flashing red light, and posting the area as an exclusion area.

Technical Specification 6.12.2 only allows the use of a flashing light as a warning device for large areas with dose rates in excess of 1,000 mrem/hr, where no enclosure can be reasonably constructed to prevent unauthorized entry. Room 450/449 had dose rates up to 150 R/hr at 18" from the SFPD and no enclosure existed for the purpose of locking. The inspector verified by observation that the entrance to Room 450 could have been maintained locked in order to prevent unauthorized entry. Failure to maintain the high radiation area/exclusion area locked or provide positive access controls over each individual entry was identified as a second example of an apparent violation of Technical Specification 6.12 (50-348, 364/88-02-01).

- (3) Technical Specification 6.8.1 requires that written procedures be established, implemented, and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, 1978. Appendix A, Regulatory Guide 1.33, Paragraph 7.e recommends that the licensee have procedures for access control to radiation areas including a radiation work permit system. Licensee Procedure, FNP-O-RCP-2, Radiation Work Permit, Section 4.1 requires that a special radiation work permit be issued for specific tasks to be performed for entries

into exclusion areas. In addition, licensee Procedure, FNP-O-M-001, Health Physics Manual, Section 4.1 requires an individual to know and follow the requirements of the RWP used to control work.

The contract decontamination workers were given instructions from their contract decontamination foreman to decontaminate Room 450/449. The dose rates in Room 450/449 ranged from 5 R/hr to approximately 150 R/hr at 18" from the source, thus requiring that the area be controlled as an exclusion area. Since the area was defined by the licensee as an exclusion area a special RWP was required for work to be performed. The contract decontamination workers were not informed of the dose rates or of the special RWP requirements for entry into room 450/449. However, the access to Room 450/449 was posted with a sign which stated "special RWP required for entry." The two decontamination workers entered the high radiation area in Room 450 on routine RWP 87-0010, which was for the performance of routine decontamination of articles. Although RWP 87-0010 required a high range dosimeter the workers entered the area without the high range dosimeter.

Failure to obtain a special RWP for work to be performed in an exclusion area and failure to comply with RWP 87-0010 requirement to have a high range dosimeter for entry to a high radiation area was identified as two examples of an apparent violation of Technical Specification 6.8.1 (50-348, 364/88-02-02).

- (4) 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 in this part, and (2) are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present.

On December 28, 1987, a decon worker entered Room 450/449, an exclusion area, without a current survey performed to evaluate the extent of radiation hazards that were present. In discussion with the licensee exclusion areas are not routinely entered to evaluate radiological conditions, therefore, the licensee was not aware of the extent of radiation hazards that were present in Room 450/449. The inspector was informed by a licensee management representative that dose rates had been measured previously up to 750 to 1,000 R/hr. Failure to perform an adequate survey to evaluate the radiation hazards that were present in Room 450/449 was identified as an apparent violation of 10 CFR Part 20.201(b) (50-348, 364/88-02-03).

- (5) 10 CFR 19.12 requires that all individuals working in or frequenting any portion of a restricted area shall be kept informed of the storage, transfer, or use of radioactive

materials or of radiation in such portions of the restricted area and in the purpose and functions of protective devices employed.

On December 28, 1987, a licensee contract decontamination worker entered Room 450/449, a high radiation area (exclusion area), Room 450/449, without being properly informed of the radiation hazards that were present. Since a survey of the area had not been performed and a preshift briefing held, the worker was not aware of what the radiation levels were in Room 450/449. The inspector determined through interviews that the individual was unaware of the meaning of the controls, such as posting as an exclusion area, a flashing red light, and a three rope barricade. The inspector determined after review of the licensee's GET program that the lesson plans for GET did not address precautions and special requirements of exclusion areas therefore, the licensee failed to properly train personnel on the precautions and limitations of exclusion areas. The failure of the licensee to inform the worker of the extent of the radiation hazards present in the exclusion area and the failure of the licensee to provide adequate training on exclusion areas was identified as an apparent violation of 10 CFR Part 19.12 (50-348, 364/88-02-04).