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

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Report Nos.: 50-269/93-07, 50-270/93-07, and 50-287/93-07

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 28242

Docket Nos.: 50-269, 50-270, 50-287 License Nos.: DPR-38, DPR-47, DPR-55

Facility Name: Oconee 1, 2, and 3

Inspection Conducted: March 1-5, 1993

Inspectors: R. B. Shortridge — Date Signed: 3/19/93
R. B. Shortridge

E. B. Pharr — Date Signed: 3/19/93

Approved By: W. H. Rankin, Chief — Date Signed: 3/25/93
Facilities Radiation Protection Section
Radiological Protection and Emergency Preparedness Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the area of occupational radiation safety and included a review of the program elements of organization and management controls, training and qualification, audits and appraisals, external exposure control, internal exposure control, control of radioactive material, surveys and monitoring, and the program to maintain personnel collective dose as low as reasonably achievable (ALARA). The inspector also reviewed previously identified items tracked by the NRC for possible closure.

Results:

The inspector found the radiation protection (RP) program at Oconee to be adequate in protecting the health and safety of the public and plant employees. The licensee's program to maintain collective dose as low as reasonably achievable (ALARA) continues to be a strength. However, during the inspection apparent violations of NRC regulations were noted. One apparent violation was for failure to post a radioactive materials area and a contaminated area in accordance with procedures. The second apparent violation was for failure to label radioactive material in the radiologically controlled area (RCA) of the plant in accordance with 10 CFR 20.1904(a)

requirements and licensee procedures, with four examples identified. Lastly, the inspection identified a concern that the program to followup correct self-identified radiological deficiencies was not assuring timely corrective actions in some issues. This inspection identified that under the Problem Investigation Process (PIP), radiological deficiencies received a low priority for correction and many were not corrected in a timely manner. At the time of the onsite inspection, a large number of PIP deficiencies did not have corrective actions assigned. This issue will be tracked by the NRC as an Inspector Followup Item (IFI).

Both violations identified in this report were preceded by similar violations within the last two years.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*B. Baron, Plant Manager
*T. Patterson, Compliance Engineer, Regulatory Compliance
*C. Yongue, Manager, Radiation Protection

Other licensee employees contacted during the inspection included craftsmen, technicians, and administrative personnel.

Nuclear Regulatory Commission

*B. Desai, Resident Inspector
*P. Harmon, Senior Resident Inspector

*Attended Exit Interview conducted on March 5, 1993

2. Organization and Management Controls (83750)

The licensee is required by Technical Specification (TS) 6.1.1.1 to establish clear lines of authority, responsibility, and communication from the highest management levels through intermediate levels including the operating organization. The inspector reviewed staffing levels and lines of authority as they related to the Radiation Protection (RP) program and discussed the organization with the RP Manager. The inspector verified that the licensee had not made changes that would adversely affect their ability to implement critical elements of the RP program.

No violations or deviations were identified.

3. Audits and Appraisals (83750)

The inspector reviewed the licensee's program for self-identification and correction of program inadequacies and weaknesses. The inspector noted that at the time of the onsite inspection the licensee had initiated 47 Problem Investigation Process Reports (PIPRs) since January 1, 1992. The inspector noted that this process was used by all work groups to identify and investigate plant-related problems. The inspector noted that the PIPRs identified procedural inadequacies, non-ALARA components/areas and work practices, and lost, drifting, and/or offscale dosimetry. Following review of the 47 PIPRs identified since January 1, 1992, the inspector noted that 23 remained open and for 17 of those remaining open corrective actions had not been proposed.

The inspector also noted problems in the followup and closure of a PIPR involving a problem with control of radioactive sources. The PIPR (identified on April 21, 1992) which documented the loss of two sources had proposed appropriate corrective actions to maintain future control of radioactive sources. However, at the time of the onsite inspection the PIPR remained open, awaiting the concurrence and approval of the

final PIPR reviewer. Following discussions with the individual to whom the PIPR was assigned for resolution, the inspector noted that there was confusion as to who was actually responsible for final PIPR review and closure. Therefore, the PIPR remained open although all corrective actions had been successfully implemented. The inspector also noted that as early as November 13, 1991 a problem with mislocation of sources was identified and during a Quality Assurance (QA) audit, NG-92-03 (ON), conducted January 6-20, 1992, the auditors recommended that procedural guidelines be established to assure positive control of radioactive sources during temporary movements. No action was planned however, since no sources had been lost at the time of the QA audit.

Another PIPR documented problems encountered while sluicing a Purification Demineralizer on November 22, 1992. During discussions with licensee representatives, the inspector noted that this sluicing process usually expended approximately 100 millirem (mrem) of exposure but due to an inadequate procedure which did not reflect recent modifications to the system the process instead expended 870 mrem. During discussions with licensee personnel which were assigned resolution of the PIPR, the inspector was informed that lack of resources and higher priority items had delayed procedural revisions which were the proposed corrective actions.

The inspector reviewed procedural guidance as documented in the Oconee Nuclear Site Directive 4.2.1, Problem Investigation Process (PIP), dated February 11, 1993. The directive provided a mechanism in which to identify, document, and respond to PIPRs with a level of effort and timeliness commensurate with their significance. The directive stated that for less significant events the responsible individual assigned to propose a resolution to the PIPR must establish a corrective action due date within 90 days of the discovery date, or at management's discretion. Additionally, once all planned corrective actions were completed or had received a work request/order number, an approver was required to sign a final and overall approval for these less significant events within 90 days, or at management's discretion. Following discussions with licensee management, the inspector was informed that for all the radiologically-related PIPRs reviewed by the inspector, most were placed in a low priority category for followup. Therefore, these did not require proposed or implemented corrective actions within 90 days of the discovery date if management felt that higher priority items should be resolved instead.

The inspector noted that this was the third inspection in a year that had identified concerns regarding licensee followup on the self-identification of radiological deficiencies. Inspection Report (IR) 92-06, dated March 6, 1992, reported that Radiological Work Practice Deficiency Reports (RWPDRs) findings were substantive but so few were written that trending was not possible. Four of seventeen RWPDRs did not have any root cause listed. Root cause determination was normally a result of the investigative process. In four of the RWPDRs, two had late notices sent on two different occasions to department managers for failure to list a corrective action and two more had late

notices sent three times for the same reason. IR 92-06 characterized the problem as the failure of plant management to be aggressive in following up on the resolution of radiological deficiencies. IR 92-17, dated November 20, 1992, reported on a new system of Radiological Deficiency Reports (RDRs) that was replaced mid year by PIPRs. The inspector found that 15 PIPRs had been written during the months from April to November 1992, and included a general range of radiological performance problems. However, nine of the 15 had not been corrected at the time of the inspection.

During the onsite inspection, the inspector informed licensee representatives that corrective actions for licensee identified problems did not always appear to be timely and that the recurrence of these problems was a concern. This issue will be tracked by the NRC as an Inspector Followup Item (IFI) 50-269, 270, and 287/93-07-03 and reviewed during a future inspection.

No violations or deviations were identified.

4. Training and Qualifications (83750)

10 CFR 19.12 requires, in part, that the licensee instruct all individuals working in or frequenting any portions of a restricted area in the health protection aspects associated with exposure to radioactive material or radiation; in precautions or procedures to minimize exposure; in the purpose and function of protection devices employed; in the applicable provisions of the Commission regulations; in the individual's responsibilities; and in the availability of radiation exposure data.

The inspector reviewed training provided to licensee employees in preparation for the licensee's change on January 1, 1993, to the revised 10 CFR Part 20 requirements. During discussions with licensee personnel, the inspector was informed that prior to implementation the licensee provided a general training overview to introduce employees to the new terminology and exposure limits of the revised regulations. The inspector reviewed the training outlines and accompanying training videos and noted that the new limits and terms were appropriately presented to licensee employees and offered a generalized overview of how the revised regulations would affect day to day plant activities, i.e. postings, decreased respirator usage, and the declared pregnant female policy. The training also introduced workers to the resulting changes with the Electronic Dose Capture (EDC) system and its interaction with the digital alarming dosimeters. The inspector noted that the training appropriately addressed the licensee's new TLDs, the purpose of the EDC system, how to access the system, the basis for the alarming dosimeter's alarm setpoints, the different alarms, and the correct response to each alarm. The training also stressed the worker's responsibility for knowing Radiation Work Permit (RWP) requirements, dose rates in the work area, and for periodically checking the cumulative dose on the alarming dosimeter.

The inspector informed licensee representatives that this training appeared to be appropriate for introducing workers to changes in terminology and plant activities due to the revised 10 CFR Part 20 regulations. The inspector also noted that the training appropriately made workers aware of their continued responsibility to be knowledgeable of RWP requirements, dose rates, and cumulative dose when utilizing the licensee's new dosimetry system and not to become complacent with the added exposure limiting features of the new system.

No violations or deviations were identified.

5. External Exposure Controls (83750)

10 CFR 20.1601(a)(3) requires the licensee to ensure that each entrance or access point to a high radiation area has entryways that are locked, except during periods when access to the areas is required, with positive control over each individual entry.

The inspector performed radiation surveys to confirm selected radiation and high radiation areas were posted in accordance with licensee procedures. The inspector did not note any deficiencies. The inspector reviewed the licensee's method for locking several high radiation areas with dose rates greater than 1 Rem/Hour measured at 30 centimeters. The inspector toured the High Pressure Safety Injection (HPSI) and Low Pressure Safety Injection (LPSI) pump rooms and noted that the licensee had placed a bar that facilitated locking, across the entryway to the pump room, to prevent inadvertent entry to the high radiation areas. Infrequent access to the pump room is necessary to permit operation of valves primarily for resin transfers during which rad levels up to 30 Rem/hr may occur for short periods. The inspector observed that the lockable bar, when employed in conjunction with the numerous pipe runs through the access area, effectively controlled access in a positive manner against inadvertent entry. An individual would have to climb over these positive access controls at considerable effort to defeat the access controls. As an additional measure to warn personnel not to enter the area the licensee placed a large high radiation area sign on the lockable bar at the entry point. The inspector obtained pictures of the area before and after placement of the sign on the bar and discussed with the licensee the proposed method of control. Based on the discussions and a review of the pictures, the licensee's locks, signs, and barriers, the inspector determined that the licensee's efforts to warn personnel of the radiations hazards in the area were reasonable and appropriate to preclude inadvertent entry.

No violations or deviations were noted.

6. Internal Exposure Controls (83750)

10 CFR 20.1204 states that for purposes of assessing dose used to determine compliance with occupational dose equivalent limits, the licensee, when required to monitor internal exposure, shall take suitable and timely measurements of concentrations of radioactive

materials in air, quantities of radionuclides in the body, quantities of radionuclides excreted from the body, or combinations of these measurements. When specific information on the behavior of the material in an individual is known that information may be used to calculate the Committed Effective Dose Equivalent (CEDE).

The inspector reviewed internal exposure records for selected individuals associated with a power entry into the Unit 3 Containment Building on January 20 and 21, 1993. The inspector noted that for the selected individuals reviewed none had worn respirators during the entries and based on air sample data, Derived Air Concentration-hours (DAC-hrs) were not assigned. During discussions with licensee representatives, the inspector was informed that followup body burden analyses (BBAs) were performed and iodine-131, -133 activity was detected. The inspector noted that based on a maximum iodine activity of 17.3 nanocuries (nCi) from a BBA performed approximately 50 minutes after the uptake, DAC-hrs assigned to the individual resulted in a CEDE of less than 1 mrem. The inspector verified that no exposures in excess of the 2000 DAC-hr annual control measure had occurred since January 1, 1993.

No violations or deviations were identified.

7. Control of Radioactive Materials and Contamination, Surveys, and Monitoring (83750)

10 CFR 20.1902(e) requires posting areas or rooms in which licensed material is used or stored. The licensee shall post each area or room in which there is used or stored an amount of licensed material exceeding 10 times the quantity of material specified in Appendix C to 10 CFR 20.1001-20.2401 with a conspicuous sign bearing the radiation symbol and the words "Caution, Radioactive Material," or "Danger, Radioactive Material."

TS 6.4.1 requires that the station be operated and maintained in accordance with approved procedures.

Radiation Protection Section Manual, Section 4.2, Posting of Radiologically Controlled Areas (RCAs) and Materials, dated January 1, 1993, requires in step 3.2.4.1 that all radiologically controlled zones (RCZs) outside of the RCA where radioactive materials are located/stored be posted as a Radioactive Material Area.

Oconee Procedure, HP/O/B/1000/07, Procedure for Roping Off, Barricading, Posting and Controlling Radiation Protection Control Zones, Revision 23, dated January 1, 1993, requires in step 4.1.6 to establish a contaminated area when removable contamination levels exceed 1,000 disintegrations per minute per 100 centimeters square (1,000 dpm/100 cm^2) beta-gamma or 20 dpm/100 cm^2 alpha in any area.

During routine tours of the Auxiliary and Radwaste Buildings, the inspector noted several areas that were not posted in accordance with licensee procedures. Radwaste Valve Room #325, a contractor storage area, had a posting on the door that no source of radioactive material was in the room. The inspector found a contaminated vacuum cleaner stored in the room that was labeled 8,000 counts per minute at one-half inch. The suction nozzle was noted to be open to the atmosphere. The inspector notified RP and a technician promptly posted the room as a radioactive materials area.

Additionally, the inspector performed random contamination surveys during routine tours. The inspector found an area in the health physics (HP) laboratory that had loose surface contamination of 3,000 disintegrations per minute (dpm)/smear. The smear was from the collar surrounding a sink drain. Again RP was notified and the area was posted as a contaminated area. The licensee was informed that the failure to post the radioactive materials area and the contaminated area in accordance with the referenced procedures was an apparent violation of 10 CFR 20.1902(e) and licensee procedures.

10 CFR 20.1904(a) requires the licensee to ensure that each container of licensed material bear a durable, clearly visible label bearing the radiation symbol and the words "Caution, Radioactive Material," or "Danger, Radioactive Material." The label must also provide sufficient information (such as radionuclides present, an estimate of the quantity of radioactivity, the kinds of materials, and mass enrichment) to permit individuals handling or using the containers or working in the vicinity of the containers, to take precautions to avoid or minimize exposures.

Radiation Protection Section Manual, Section 5.1, Movement of Radioactive Materials Within the Controlled Area, dated January 1, 1993, step 3.1.2.1, requires that all radioactive materials (except tools from the hot tool crib or satellite storage containers and hand held items) within the Radiologically Controlled Area (RCA) shall be: 1) surveyed; 2) containerized as appropriate for contamination control; and 3) labeled per reference 2.4 (Posting of RCAs and Materials) or attended by an individual who takes precautions to prevent exposure of any individual to radiation or radioactive materials in excess of limits established by 10 CFR Part 20 until the material is either stored per step 3.1.5, or placed into a RCZ for maintenance, testing, etc. per reference 2.4, or properly disposed of per reference 2.7.

During tours of the RCA, the inspector noted that there were items with radioactivity that were not labeled as prescribed by the above procedure. A high volume air sampler, #H809-6199, was reading 100,000 counts per minute (cpm) as measured by a RM-14 with a HP-210 probe. The air sampler was stored in a radioactive materials storage bin with other contaminated air samplers that had attached radioactive material labels. The inspector requested a RP technician to survey the air sampler and label it properly. During tours the following day, the inspector noted the same air sampler (#H809-6199) was in the same area but had not been labeled as requested the previous day. The inspector

located a different RP technician and requested the air sampler be surveyed and labeled. The second technician properly surveyed and labeled the item. The inspector requested a RP supervisor to perform a test on several high volume air samplers with very high contamination levels by sampling the exhaust to determine if the contamination was loose. This was done and the results indicated that the contamination was not loose or free to be dispersed in the exhaust.

The inspector also noted that seven stanchions were staged outside the Unit 3 RP office. The stanchions were used for supporting barriers for RCAs. One was appropriately labeled, however, three were found to have fixed contamination levels greater than 10,000 dpm as measured by a RM-14 and HP-210 probe. In addition, a mop bucket reading 10,000 dpm and an electrical extension cord reading 35,000 dpm were also located in the clean area of the Auxiliary Building. Both were noted to have fixed contamination and were not labeled. The inspector notified RP of the items and all were promptly surveyed and properly labeled. The inspector informed the licensee that the failure to label these items in accordance with requirements was an apparent violation of 10 CFR 20.1904(a) and licensee procedures.

The inspector informed the licensee that the above events were repeats of previous violations. IR 91-24, dated September 13, 1991, contained a non-cited violation (NCV) for failure to post a component maintenance area and an airborne radioactivity area on the refueling floor. IR 92-06, dated March 6, 1992, contained an NCV for failure to label a contaminated lead brick and a pair of pliers in the primary chemistry laboratory. IR 92-17, dated November 20, 1992, contained a violation for failure to post an airborne radioactivity area in the Unit 3 Containment Building and contaminated areas in the primary chemistry laboratory. Also, a violation was cited for failure to label a tool box found in the primary chemistry laboratory and a radioactive air sampler. The concern for the repetition of the violations was discussed with licensee management both during the inspection and at the exit interview.

The licensee continues to maintain approximately 93-94 percent of the RCA as a non-contaminated area. The inspector noted that contaminated areas in the RCA were not extensive and did not appear to hinder management or worker access to job sites.

Two apparent violations were identified involving (1) the licensee's failure to post a radioactive materials area and a contaminated area in accordance with 10 CFR 20.1902(e) requirements and referenced procedures (VIO 50-269, 270, and 289/93-07-01); and (2) the licensee's failure to label radioactive items in accordance with 10 CFR 20.1904(a) requirements and licensee procedures (VIO 50-269, 270, and 289/93-07-02).

8. Program to Maintain Collective Dose As Low As Reasonably Achievable (ALARA) (83750)

The inspector was requested by the resident inspector to review the details surrounding recent entries to all three Containment Buildings at power to perform the venting of a Reactor Coolant Makeup Pump Accumulator (RCMPA). The licensee provided mock-up training for the job prior to the work being performed. The licensee reduced reactor power to 54 percent for the work in Units 1 and 3. However, the entry and operation on the RCMPA in Unit 2 was performed at 100 percent power. The inspector commented to the licensee that additional information regarding projected person-rem prior to the operation would be a desirable ALARA practice.

A review of the dose rates in the area of the accumulators, with Unit 2 ranging from 3 Rem/hour to 10 Rem/hour, suggested the need for multiple dosimetry due to the non-uniform fields of radiation. Due to an unscheduled power reduction in Unit 1, the inspector was able to make a power level entry into the unit at 16 percent power. The inspector wore multiple digital alarming dosimeters and observed and surveyed the work area used to effect the venting in Unit 1. The inspector did not receive a differing dose to the thigh area or the arm area. The inspector also interviewed the RP technicians that performed the operations in Units 2 and 3 and found that in lieu of multibadging the workers were positioned such that the radiation field was uniform.

Licensee representatives were informed that, based on the inspector's review, multibadging dosimetry was no longer a concern. However, the inspector discussed the importance of using good administrative controls for operations where radiological risks were increased.

No violations or deviations were identified.

9. Review of Previously Identified Inspection Findings (92702)

(Closed) VIO 50-269, 270, 287/92-17-03: Failure of two employees to access a RWP before performing work.

The licensee had implemented a combined system for accessing RCAs and RCZs which was expected to minimize/prevent the recurrence of this problem. To access one of these areas, required the automated setting of a digital alarming dosimeter in conjunction with accessing the RWP to be worked. During the onsite inspection, the inspector monitored for the recurrence of personnel in the RCA or in RCZs without being on an RWP and did not have any concerns. This item is considered closed.

10. Exit Meeting

The inspector met with licensee representatives denoted with an asterick in Paragraph 1 on March 5, 1993. The inspector discussed the examples of inadequate posting of RCZs as an apparent violation, as well as, the apparent violation for failure to label radioactive material in the RCA.

The inspector also discussed the fact that both violations were repeats of violations identified in the past two years. In addition, the inspector discussed the significance of the weakness in the program for identifying and correcting radiological deficiencies.

The inspector did not receive any proprietary material or dissenting comments.

Item Number	Description and Reference
50-269, 270, 287/93-07-01	VIO - Two examples of failure to adequately post RCZs (Paragraph 7).
50-269, 270, 287/93-07-02	VIO - Failure to label Radioactive Material (Paragraph 7).
50-269, 270, 287/93-07-03	IFI - Question of timely correction of radiological deficiencies (Paragraph 3).