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NUCLEAR REGULATORY COMMISSION
REGION II
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ATLANTA, GEORGIA 30323-0199

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Report Nos.: 50-269/93-28, 50-270/93-28, and 50-287/93-28

Licensee: Duke Power Company
P. O. Box 1007
Charlotte, NC 28201-1007

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: October 18-22, 26, and 29, 1993

Inspectors: _____ 11/10/93
B. A. Parker Date Signed

_____ 11/10/93
E. B. Pharr Date Signed

Approved by: _____ 11/16/93
W. H. Rankin, Chief Date Signed
Facilities Radiation Protection Section
Radiological Protection and Emergency Preparedness Branch
Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, announced inspection was conducted in the area of occupational radiation safety and included an examination of: organization and management controls, audits and appraisals, training and qualification, external exposure control, access controls, internal exposure control, control of radioactive materials and contamination, surveys and monitoring, and maintaining occupational exposures ALARA.

Results:

Based on interviews with licensee management, supervision, personnel from station departments, and records review, the inspector found the radiation protection (RP) program to be effective in protecting the health and safety of plant employees. One apparent violation was identified for failure to adequately control access to high radiation areas (Paragraph 5.e). Also, one unresolved item (URI) was identified for a procedural discrepancy involving Security access to three high radiation area keys (Paragraph 5.e). Program strengths were noted in the areas of respirator reduction, control of contamination, and audits.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

#%*B. Barron, Station Manager
*E. Brown, Scientist, Radiation Protection
T. Cherry, Radiation Protection Supervisor, ALARA
M. Coren, Quality Verification, General Office
*J. Hampton, Site Vice President
*B. Jones, Chemistry
D. Kelly, Instructor, Training Division
J. Long, General Supervisor, Radiation Protection
*M. Patrick, Regulatory Compliance
*S. Perry, Regulatory Compliance
*S. Spear, General Supervisor, Radiation Protection
C. Yongue, Manager, Radiation Protection

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

Nuclear Regulatory Commission

#%W. Cline, Chief, Radiation Protection and Emergency Preparedness Branch
P. Harmon, Senior Resident Inspector
#A. Herdt, Chief, Reactor Projects Branch No. 3
*D. Jones, Senior Radiation Specialist, Region II
*L. Keller, Resident Inspector
K. Poertner, Resident Inspector
#%W. Rankin, Chief, Facilities Radiation Protection Section
%P. Skinner, Chief, Reactor Projects Section 3B

*Denotes attendance at exit meeting held on October 21, 1993
%Denotes participation in telephone call on October 26, 1993
#Denotes participation in telephone call on October 29, 1993

2. Organization and Management Controls (83750)

The inspector reviewed changes made to the licensee's organization, staffing levels and lines of authority as they related to radiation protection (RP). Since the last inspection, one of three General Supervisors was promoted to a new position within the company. The vacated position was abolished and the responsibilities reassigned, increasing the overall responsibilities of the other two General Supervisors and the Supervising Scientist.

The two General Supervisors and the Supervising Scientist reported to the RP Manager, who reported to the Station Manager. In discussions with licensee management, the inspector learned that the licensees's total RP staff has been downsized from approximately 90 in early 1993 to 86, currently. The reorganization and downsizing did not appear to be significantly impacting the licensee's ability to function effectively.

No violations or deviations were identified.

3. Audits and Appraisals (83750)

a. Audits

Technical Specification (TS) 6.1.3.4 requires audits of site activities to be performed under the cognizance of the Nuclear Safety Review Board (NSRB) encompassing conformance of station operation to all provisions contained in the TSs and applicable license conditions.

The inspector reviewed the most recent Quality Verification Department audit of the RP program conducted March 1-17, 1993, and documented in Report NG-93-04(ON), "Chemistry and Radiation Protection." The audit included an evaluation of radiation worker practices, posting and labeling, control of radioactive materials, laboratory analysis practices, respiratory protection, surveillance and controls, source control, and aspects of the chemistry program. The inspector determined that the audit was detailed and addressed appropriate RP program areas. The inspector noted that the audit included performance-based evaluations as well as review of pertinent documentation and procedures. Review of audit documentation and discussion with licensee representatives indicated that the audit was conducted by individuals knowledgeable of the RP area, many of which held RP positions within the utility.

The audit identified five RP-related findings, along with three audit followup items, and multiple observations and recommendations. The inspector noted that the findings were placed into the licensee's plant-wide Problem Investigation Process (PIP) system for tracking and were subsequently reviewed by the auditing group for adequacy of corrective actions. The inspector noted that the audit followup items were also subsequently reviewed but that followup of observations and recommendations was at the discretion of the RP group. Review of the audit findings revealed that corrective actions were both timely and appropriate. Overall, the inspector noted that the

audit results contained issues of substance, were well documented, and were reported to facility management, as required. The inspector informed licensee representatives that their audit program was conducted consistent with licensee and regulatory requirements. Based on the comprehensiveness of the audits and identification of substantive findings, the inspector noted the Quality Verification audits to be beneficial in improving the overall effectiveness of the RP program.

No violations or deviations were identified.

b. Problem Investigation Process (PIP)

The inspector reviewed the licensee's program for self-identification and correction of program inadequacies and weaknesses. The inspector noted that PIP reports were utilized by all facility work groups to identify and investigate any plant-related unexpected occurrences or areas of improvement. The inspector reviewed the licensee's procedure for implementation of the PIP system, Oconee Nuclear Site Directive 4.2.1, "Problem Investigation Process (PIP)," dated February 11, 1993. The directive provided a mechanism for identification, documentation, and response to PIPs with a level of effort and timeliness commensurate with their significance. The inspector reviewed and discussed with cognizant personnel the PIP system and noted that each PIP was initially reviewed by a Screener to ensure enough data was available for resolution, to determine significance of the PIP, to assign a responsible group for resolution, and ultimately to provide final and overall approval of implementation of corrective actions. The inspector also noted that the program utilized a Safety Review Group to track and trend the PIPs and to ensure their closure. In addition, a management team met at least bi-monthly to review data, trends, programmatic issues, and to assess the overall effectiveness of problem resolution and corrective actions.

The inspector noted that in the RP area the PIPs identified procedural and Radiation Work Permit (RWP) inadequacies, non-ALARA components/areas and work practices, posting and labeling inconsistencies, and dosimetry inadequacies. Following review of selected PIPs identified since January 1, 1993, and selected PIPs identified during 1992, which still remained open, the inspector noted that many of the open PIPs were maintenance items requiring a modification and others were actually closed items in which the closure paperwork was never completed. The inspector discussed with the RP PIP coordinator this issue of PIPs remaining open for excessive periods of time due to overdue administrative closure. During the discussions, the inspector was informed that since the previous inspection conducted March 1-5, 1993 and documented in

Inspection Report (IR) 50-269, 270, 287/93-07, the licensee's management team which was meeting at least bi-monthly to review status of the PIP program had stressed and proposed action plans for the need and importance of timely resolution of identified PIPs. The inspector was also informed that since this previous inspection the PIP Coordinators had been retrained in their responsibilities as coordinators in an effort to lessen the confusion as to who was actually responsible for final PIP review and closure. During review of meeting minutes from this management team, the inspector noted that the team was chaired by the Site Vice President and was comprised of management representatives from operating departments. The inspector also verified that during recent meetings the team had reviewed trendings for programmatic issues, PIPs with overdue corrective actions or finalized and approved closures, and had devised an action plan for emphasizing plant management's expectations of and commitment to the PIP system.

The inspector informed licensee representatives that the PIP program appeared to be functioning appropriately and had improved in its resolution and closure of identified issues. The inspector also noted that for those selected PIPs reviewed there appeared to be an appropriate threshold for identifying radiological deficiencies.

No violations or deviations were identified.

4. Training and Qualification (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.

During the onsite inspection the inspector reviewed the licensee's program for providing training to both general plant workers and RP technicians. The inspector was informed that licensee employees received General Employee Training (GET) prior to beginning work activities, and were required to complete an abbreviated retraining annually. The inspector noted that topics presented in GET included industrial safety, emergency response, plant security, basic radiation theory and the biological effects of radiation exposure, access control, and procedural and Radiation Work Permit (RWP) compliance. The inspector noted that the training material specifically addressed the licensee's policies regarding proper use of the recently implemented

Electronic Dose Capture (EDC) and Digital Alarming Dosimetry (DAD) system, maintaining workers' exposures ALARA, female employees declaring their pregnancy, and postings throughout the plant's Radiation Areas. The inspector also noted that due to recurrent problems at the facility regarding inadequate procedural adherence, the training material stressed the licensee's Stop, Think, Act, Review (STAR) program, which included an employee's right to stop unsafe or inappropriate work activities, the need for independent verification by plant workers, and use of the problem reporting system, the PIP.

The inspector also discussed with licensee representatives and reviewed the training program for RP technicians. The inspector noted that the initial training program consisted of eight weeks of formalized classroom training, including topics related to basic science and math, site and systems familiarization, and health physics theory. Following this classroom training the technicians began on-the-job training (OJT) and subsequently completed task qualifications to demonstrate and to certify their proficiency in performing their assigned work activities. The inspector was informed that requalification to a task was not routinely required, unless significant changes had been made to the implementing procedure or declining proficiency was noted. The inspector noted that with the implementation of the revised 10 CFR Part 20 at the facility, technicians had requalified to applicable tasks, including evaluation of body burden analyses, issue and use of respiratory protection equipment, preparation of RWPs, use of alarming dosimetry, and access controls to Extra High Radiation Areas (EHRAs) and Very High Radiation Areas (VHRAs).

The inspector was also informed that each technician was also required to participate in the continuing training program. Continuing training was routinely accomplished during a 16 hour session provided each quarter. The inspector reviewed the outlines for continuing training presented during 1993, and noted that topics included procedural adherence, including implementation and use of the PIP system, personnel contamination incidents, dosimetry issue, records control, dose extensions, and RWP writing. In addition, the technicians were required to complete eight modules of a computer-based Basic Fundamentals Retraining, annually. The inspector noted that this retraining program was comprised of a total of 26 modules and successful completion of a module required passing an examination with a minimum of 80 percent correct.

The inspector reviewed training records for selected RP technicians and noted successful completion of GET, initial technician training, continuing training, and appropriate qualification to applicable tasks. Overall, the inspector found the radiation protection training provided to both general employees and RP technicians to be thorough and well prepared.

No violations or deviations were identified.

5. External Exposure Control (83750)

10 CFR 20.1201(a) requires each licensee to control the occupational dose to individual adults, except for planned special exposures under 10 CFR 20.1206, to the following dose limits:

(1) An annual limit, which is more limiting of : (i) the total effective dose equivalent (TEDE) being equal to 5 rems: or (ii) the sum of the deep-dose equivalent and the committed dose equivalent to any organ or tissue other than the lens of the eye being equal to 50 rems.

(2) The annual limits to the lens of the eye, to the skin, and to the extremities, which are: (i) an eye dose equivalent of 15 rems; and (ii) a shallow-dose equivalent of 50 rems to the skin or to any extremity.

10 CFR 20.1501(a) 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.

a. Exposure Control

On March 2, 1993, the licensee fully implemented the use of DADs in conjunction with their automated access system, the EDC system, to enhance their ability to capture and track personnel dose on a daily basis. The EDC system tracked dose, dose alarms, and RWPs, and provided a means to restrict access to the Radiologically Controlled Area (RCA) if certain training or other factors needed to be addressed. The standard administrative dose allowance per site employee was 2,000 millirem per year. At 80 and 90 percent of the administrative dose allowance, the EDC system had "alert" and "hold" stopgaps, respectively. Upon reaching the alert point, the individual's supervisor was required to request a dose extension or the individual's thermoluminescent dosimeter (TLD) would be pulled once the hold point was reached. A daily EDC printout tracked administrative, TEDE, Committed Effective Dose Equivalent (CEDE), shallow, and lens of the eye doses, as well as Derived Air Concentration-hours (DAC-hours). From a review of records and discussions with licensee representatives, the inspector noted that worker dose in general appeared to be under control and that only one dose extension had been given to date. The extension was given as a result of an individual receiving additional dose while on assignment outside the Duke system. The EDC system tracked Duke and non-Duke dose in order to assure adherence to procedural administrative allowances as well as 10 CFR Part 20 limits. As of October 21, 1993, the maximum Duke (Oconee) TEDE dose was approximately 1,030 millirem while the

maximum total TEDE (Duke and non-Duke) dose was slightly over 2,000 millirem. From observations, the inspector noted personnel utilizing the EDC system without problem and, when questioned, personnel were knowledgeable of the requirements regarding RWPs, dose, DAD alarms, etc.

During an inspection conducted September 2-4 and 8-9, 1992, and documented in IR 92-17, a concern regarding the EDC system was noted in that plant personnel did not appear to be fully utilizing the system. During the October 1993 inspection, the inspector noted that the licensee's recording and tracking of workers' daily doses appeared to have significantly improved with the addition of the DADs and their interface with the EDC system. The EDC system seemed to be accepted better by plant personnel and the DADs and DAD readers made the system more "user friendly." Overall daily dose capture and tracking should improve; however, some potential problems could still exist in that individuals may not properly switch between appropriate RWPs as required by procedures while logged in on the system. The inspector discussed the potential problem with licensee personnel and the senior resident inspector, and both agreed that a problem could exist in this area.

No violations or deviations were identified.

b. Personnel Contamination Events

The inspector reviewed the licensee's personnel contamination events (PCEs) to date in 1993. PCEs were tracked by the number of skin and clothing events as well as the number of particle and dispersed events. Some overlap in total numbers did occur in that an individual with contaminated clothing and skin was normally accounted for twice. The inspector noted that when contamination involved licensee-supplied modesty garments only with no skin contamination, a PCE report was not generated. This is an acceptable industry practice.

The 1993 skin contamination target was 93. As of October 21, 1993, a total of 128 PCEs were documented, 51 of which were skin and 77 of which were clothing. The inspector reviewed a number of PCEs and noted that the most significant event occurred on January 1, 1993. A worker was collecting and removing trash from containment and apparently picked up a hot particle on the fingertip. The maximum skin dose was calculated to be 10,340 millirem from direct survey measurements taken of the particle following its removal from the worker's finger. The particle was retained and determined to be a fuel fragment. The licensee concluded that the particle was most likely picked up during work in containment instead of already being in the worker's glove at the time of dressout. The conclusion was based on (1) the licensee launders all of its protective clothing and passes it through a multi-detector laundry frisker prior to reissuance and (2) the particle would most likely have been

detected had it passed through the laundry frisker. The licensee conducted followup surveys and wipedowns in the areas traveled by the worker while in containment and found no other particles. No regulatory limits were exceeded as the maximum calculated exposure was well below the 50 rem skin/extremity limit and no problems were noted with the licensee's methods or procedures.

No violations or deviations were identified.

c. Personnel Dosimetry

10 CFR 20.1502(a) requires each licensee to monitor occupational exposure to radiation and to supply and require the use of individual monitoring devices by:

(1) Adults likely to receive, in one year from sources external to the body, a dose in excess of 10 percent of the limits in 10 CFR 20.1201(a);

(2) Minors and declared pregnant women likely to receive, in one year for sources external to the body, a dose in excess of 10 percent of any of the applicable limits of 10 CFR 20.1207 or 10 CFR 20.1208; and

(3) Individuals entering a high or very high radiation area.

In January 1993, the licensee changed their personnel dosimetry of record from film badges processed monthly to four-chip TLDs processed quarterly. The site provided terminating workers with a letter estimating their dose while onsite and the licensee's General Office (GO) provided final termination letters once each quarter. The GO read all of the TLDs and the inspector verified that the licensee was NVLAP-certified in all eight categories, effective until April 1, 1994.

As mentioned, DADs were used primarily for daily dose tracking and the licensee maintained approximately 1500 DADs onsite. Extra DADs were available from other Duke sites, if needed. The DADs were robotically calibrated every six months. All DADs examined by the inspector were calibrated as required. According to the licensee, the number of problems associated with DADs, some of which were captured by the PIP system, was very low considering the thousands of entries made into the RCA. The inspector discussed the correlation of DAD dose and TLD dose and noted that to date correlation was approximately 88 percent, slightly lower than other Duke sites. However, the licensee informed the inspector that the correlation issue was being addressed by all three Duke plants in order to agree on one common method for correlation calculation.

During tours of the RCA, the inspector noted that personnel were wearing DADs and TLDs properly.

No violations or deviations were identified.

d. Declared Pregnant Women

10 CFR 20.1208(a) requires each licensee to ensure that the dose to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, does not exceed 0.5 rem.

10 CFR 20.2106(e) requires each licensee to maintain the records of dose to an embryo/fetus with the records of the declared pregnant woman. The declaration of pregnancy shall also be kept on file, but may be maintained separately from the dose records.

The inspector learned from discussions with licensee representatives that since January 1, 1993, six workers had declared to be pregnant. Three of the six declarations were still "active" at the time of the inspection. All of the declared pregnant women (DPWs) were badged at the time of declaration, as all employees onsite are badged on a quarterly basis. After declaring, the DPWs were badged with TLDs processed monthly. The inspector verified that no administrative or regulatory limits were exceeded with regards to any of the six pregnancies.

No violations or deviations were identified.

e. Access Controls for High Radiation Areas

10 CFR 20.1601(a) requires that the licensee ensure that each entrance or access point to a high radiation area has one or more of the following features:

(1) A control device that, upon entry into the area, causes the level of radiation to be reduced below that level at which an individual might receive a deep-dose equivalent of 0.1 rem in one hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates;

(2) A control device that energizes a conspicuous visible or audible alarm signal so that the individual entering the high radiation area and the supervisor of the activity are made aware of the entry; or

(3) Entryways that are locked, except during periods when access to the areas is required, with positive control over each individual entry.

10 CFR 20.1601(b) states that in place of the controls required in 20.1601(a) for a high radiation area, the licensee may substitute continuous direct or electronic surveillance that is capable of preventing unauthorized entry.

10 CFR 20.1601(c) states that a licensee may apply to the Commission for approval of alternative methods for controlling access to high radiation areas.

Prior to March 1993, the licensee historically chose to lock high radiation areas (HRAs) at 100 millirem per hour pursuant to 10 CFR Part 20. Most commercial nuclear power plants in the U.S. have been approved by the NRC to control access to HRAs by utilizing alternative methods other than those prescribed in 10 CFR Part 20. In all cases, these alternative methods have been approved in the form of a TS change. The standard TS change generally allowed the doors/barriers leading to HRAs with radiation levels between 100 and 1,000 millirem per hour to be unlocked, with other specified access controls employed. HRAs with radiation levels in excess of 1,000 millirem per hour remained locked and the keys controlled.

In early 1993, the licensee decided to adopt the change in practice and unlock HRAs with radiation levels between 100 and 1,000 millirem per hour as part of a utility effort to be consistent with the other two Duke nuclear plants. The other Duke plants adopted and implemented the standard TS change years ago. The licensee conducted an internal evaluation and the decision was made to control access in accordance with Draft Regulatory Guide (RG) DG-8006, "Control of Access to High and Very High Radiation Areas in Nuclear Power Plants." In March 1993, the HRA doors/barriers that met the guidance of the draft RG began to be unlocked. In June 1993, the draft guide was finalized and became effective as RG 8.38 (same title). During discussions with licensee personnel and review of procedural requirements during the October 1993 inspection, the inspector was informed that the change in operating policy had been made, but no TS changes or other approvals were obtained. The inspector questioned the licensee's judgement in not seeking NRC approval for the change and informed the licensee that an apparent violation of 10 CFR 20.1601(a) had occurred due to the fact that the change was made without the approval of the NRC pursuant to 10 CFR 20.1601(c).

The inspector verified the existence of HRAs that did not satisfy the access control requirements specified in 10 CFR Part 20. For example, Room 121 (Unit 2 decay heat removal system) had radiation levels that ranged 120 - 200 millirem per hour at 30 centimeters and neither of the two entrances had one or more of the features specified in 20.1601(a) or (b). The licensee provided a listing of HRAs that had been locked as required and had since been unlocked pursuant to the change in policy, including Room 121.

From discussions with licensee personnel and the inspector's observations, it appeared that during the period of March - October 1993, the licensee maintained approximately 50 rooms as HRAs and failed to ensure that each entrance or access point into those HRAs had one or more of the features required by 20.1601(a) or (b).

At the exit meeting, the licensee indicated that they did not agree that a violation had occurred and requested clarification for their arguments that (1) they were in compliance with 20.1601(b) and, therefore, did not have to follow 20.1601(a) because the March 1993 implementation of DADs as part of the EDC system provided continuous electronic surveillance as referred to in 20.1601(b), and (2) RG 8.38 contains a statement that indicates that the method described in the RG is an acceptable alternative method to the NRC; therefore, the intent of 20.1601(c) was met.

Following the inspection, NRC Regional and Headquarters personnel conferred and agreed that (1) DADs did not fulfill the 20.1601(b) requirement as DADs are not "capable of preventing unauthorized entry," and (2) the statement in RG 8.38 did not constitute a "blanket approval." Therefore, specific NRC approval to use an alternative method was still required pursuant to 20.1601(c).

The licensee was informed on October 26, 1993, that an apparent violation would be cited and, at that time, the licensee agreed to initiate corrective actions (VIO 50-269, 270, 287/93-28-01). On October 28, 1993, the licensee filed a formal request for approval with the Oconee Project Manager in NRC Headquarters to implement RG 8.38, "Control of Access to High and Very High Radiation Areas in Nuclear Power Plants," dated June 1993, as an alternative method to 10 CFR 20.1601.

The inspector also reviewed the established controls in place for keys to three HRAs. Each door to the HRAs was locked and posted as an EHRA, which was the licensee's designation for a HRA with radiation levels in excess of 1,000 millirem per hour and less than 500 rads per hour. The doors led to the personnel emergency escape hatches to each of the three units. Security conducted daily checks on the doors and the corresponding security alarms and, therefore, maintained keys to perform the checks. The keys only worked for those three doors and were not HRA "master" keys. From a regulatory standpoint, specifically 10 CFR 20.1601, the licensee's control of the three doors was appropriate, as were the postings. However, the licensee's procedure that addressed HRA key control, Radiation Protection Directive No. III-15, "Access Controls for High, Extra High, and Very High Radiation Areas," Revision (Rev.) 3, dated October 1, 1993, indicated that Reactor Building keys were only controlled by the Operations Shift Supervisor and RP personnel. The licensee considered those three keys controlled by Security to perform their daily checks to be Reactor Building keys.

The inspector discussed the issue with licensee personnel who agreed that there was a discrepancy with the procedural requirements and their current practice. The licensee proposed to correct the situation by revising the procedure to allow Security to have access to those three particular doors/keys. Although the licensee was technically not in compliance with the procedure, based on the nature of the problem, the licensee's proposed corrective action, and the lack of safety significance and/or Part 20 inconsistency, the inspector informed the licensee that the issue would be tracked as an unresolved item (URI 50-269, 270, 287/93-28-02).

One apparent violation and one unresolved item were identified.

6. Internal Exposure Control (83750)

10 CFR 20.1502(b) requires each licensee to monitor the occupational intake of radioactive material by and assess the committed effective dose equivalent to:

(1) Adults likely to receive, in one year, an intake in excess of 10 percent of the applicable ALI in Table 1, Columns 1 and 2 of Appendix B to 10 CFR 20.1001-20.2401; and

(2) Minors and DPWs likely to receive, in one year, a committed effective dose equivalent in excess of 0.05 rem.

10 CFR 20.1204(a) states that for the purposes of assessing dose used to determine compliance with occupational dose equivalent limits, each licensee shall, when required under 10 CFR 20.1502, take suitable and timely measurements of:

(1) Concentrations of radioactive materials in air in work areas; or

(2) Quantities of radionuclides in the body; or

(3) Quantities of radionuclides excreted from the body; or

(4) Combinations of these measurements.

The licensee conducted an evaluation based on operating experience and historical data and concluded that it was unlikely that plant workers would exceed 10 percent of any Annual Limit of Intake (ALIs). Although not required to monitor, the licensee chose to monitor in order to track any internal doses for future reference. The licensee calculated Derived Investigational Levels for internal use and made the decision to assign an internal dose to an individual if the dose (1) exceeded 10 millirem CEDE for a special body burden analysis (BBA) or (2) exceeded 100 millirem CEDE for a routine BBA.

Radiation Protection Directive No. VI-1, "Internal Dose Assessment," Rev. 1, dated March 22, 1993, was the main governing document for the licensee's internal exposure program. The inspector reviewed the procedure and noted that initial, annual, and termination bioassay measurements were routinely required for workers who were assigned dosimetry. The inspector reviewed records of selected contract and plant personnel and determined that routine and special BBAs were performed as required. In addition, special BBAs were performed as necessary including when individuals underwent nuclear medicine procedures and when certain incidents, such as facial contaminations, occurred. Internal exposure was primarily monitored by DAC-hours, which were tracked predominately through general area air sampling. A BBA was required for individuals suspected of exceeding four DAC-hours in a seven day period; however, an internal dose was not routinely assigned based solely on DAC-hours. As of October 20, 1993, the licensee had performed two internal dose assessments for the year and both had been calculated to be approximately 10 millirem CEDE.

The inspector discussed respirator reduction and engineering controls with the licensee and learned that, as compared to the previous unit outage, respirator usage was reduced by approximately 50 percent during the Unit 1 winter outage, and by approximately 70 percent during the Unit 2 spring outage. Although respirator usage reduced drastically and overall work scope remained relatively unchanged, no significant increase in internal exposures nor PCEs was noted by the licensee. According to the licensee, use of engineering controls had not significantly increased, but were utilized as needed. The licensee indicated that although lapel samplers were not routinely used, specific airborne or airborne-potential jobs were monitored closely. The inspector considered the licensee's effort to reduce the amount of respirator usage a program strength.

No violations or deviations were identified.

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

a. Posting and Labeling

10 CFR 20.1902(e) requires that 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 such material specified in Appendix C to 20.1001-20.2401 with a conspicuous sign or signs bearing the words "Caution, Radioactive Material(s)" or "Danger, Radioactive Material(s)."

10 CFR 20.1904(a) requires the licensee to ensure each container of licensed material bears 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 the radionuclide(s) present, an estimate of the quantity of radioactivity, the date

for which the activity is estimated, radiation levels, 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.

During tours of the RCA, the inspector noted that all postings and labeling observed were appropriate. All signs were conspicuous and legible and maps and labels were clearly visible and informative. The inspector also conducted random independent radiation surveys and noted no problems with observed radiation levels.

No violations or deviations were identified.

b. Area Contamination

According to the licensee, 116,330 square feet (ft^2) of floor space was maintained as radiologically controlled. To control contamination at its source, the licensee's aggressive program focused on individual training, use of good radiological techniques, containments, and maintaining clean areas of the RCA at levels below the limit of 1000 disintegrations per minute per 100 square centimeters (dpm/100 cm^2). As a result of these efforts as well as aggressive decontamination work, the licensee's contaminated area in the RCA was approximately 1600 ft^2 (1.4 percent) at the time of inspection.

Based on the above the inspector concluded that the licensee was effectively controlling the spread of contamination and considered the effort a program strength.

No violations or deviations were identified.

8. Program for Maintaining Exposures As Low As Reasonably Achievable (ALARA) (83750)

10 CFR 20.1101(b) requires that each licensee use, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as reasonably achievable (ALARA).

During discussions with licensee representatives, the inspector was informed that during 1993 the licensee had completed two refueling outages and was scheduled to begin a Unit 3 refueling outage during the latter part of the December. The inspector was also informed that during the period from January 1 to September 30, 1993, the licensee's cumulative exposure was approximately 200 person-rem. The licensee was estimating that their annual exposure for 1993 would be well below their projected 1993 exposure goal of 350 person-rem.

The inspector reviewed the licensee's outage reports for both the Unit 1 and Unit 2 outages completed during 1993. The inspector noted that for the 53 day Unit 1 outage the licensee accumulated approximately 140 person-rem, and approximately 120 rem during the 56 day Unit 2 outage. Licensee projections for cumulative exposure during the Unit 1 and Unit 2 outages was approximately 185 person-rem and 209 person-rem, respectively. The inspector noted that the successful implementation of induced crud bursts for each unit was beneficial in reducing primary area dose rates, both contact and general area, by as much as half. During the Unit 2 outage, the licensee utilized their EDC and DAD system, and implemented new video and radio systems, which the licensee credited with being positive initiatives in maintaining exposures ALARA in that worker awareness and exposure control measures were supplemented. The inspector was informed that during the upcoming Unit 3 outage the licensee would also be using the DADs as part of a telemetric monitoring system, and the video and radio systems to aid with remote monitoring capabilities. The licensee was estimating a cumulative exposure of approximately 300 person-rem during the Unit 3 outage, in part due to the required ten-year Inservice Inspection (ISI), and lingering problems with hot particles and contamination resultant of previous fuel defects and incidents. The inspector also discussed initiatives, for both immediate and long term dose savings, that recently had been completed or were planned for implementation during each unit outage. These included replacement of Component Drain Header piping and associated valves, subsequent permanent shielding of this piping, and also installation of permanent playpens for steam generator work areas to aid in contamination control, and time, dose, and radioactive waste reductions. Also, removal of components which have historically acted as crud traps and flushing of hot spots have received priority during outages and has been an effective tool in reducing source term and area dose rates. The inspector noted that the licensee was appropriately pursuing initiatives to reduce personnel exposures during outages and had been successful during the current year in that the licensee was expecting to complete the calendar year with the lowest cumulative exposure during their operating history.

The inspector also reviewed ALARA Problems Reports (APRs) submitted during 1993, and minutes from ALARA Committee meetings conducted during 1993. The inspector noted that during the year six APRs had been submitted to the ALARA Committee for review. The inspector noted that although the number of APRs submitted to the Committee for review was limited, the issues were substantive and resolution appeared to result in dose savings for the licensee. The inspector also noted that the ALARA Committee was meeting quarterly and was comprised of the Plant Manager and his direct reports. The inspector noted that the Committee appropriately reviewed and proposed action plans for followup on approved APRs and ALARA action items, as well as discussed source term and dose reduction initiatives. The inspector noted that both processes provided the licensee an adequately implemented method for review and implementation of efforts to reduce personnel exposures.

No violations or deviations were identified.

9. Review of Previously Identified Inspection Findings (92702)

(Closed) VIO 50-269, 270, 287/93-07-01: Two examples of failure to adequately post Radiation Controlled Zones (RCZs).

(Closed) VIO 50-269, 270, 287/93-07-02: Failure to label radioactive material.

The inspector reviewed the licensee's corrective actions to the above violations, which included additional training on posting and labeling for RP personnel and increased awareness for attention to detail, and no problems were noted. Also, the inspector conducted random radiation surveys during plant tours and observed no problems with postings or radioactive material labeling. These items are considered closed.

(Closed) IFI 50-269, 270, 287/93-07-03: Question of timely correction of radiological deficiencies.

The inspector reviewed the licensee's PIP procedures as well as the outstanding PIPs assigned to the RP department. Many of the open PIPs were maintenance items requiring a modification and others were actually closed items in which the closure paperwork was never completed. A few of the PIPs that remained open were left over from 1992; however, overall, an excessive number of outstanding PIPs did not exist. The inspector concluded that the licensee was adequately responding to and closing out PIPs. This item is considered closed.

10. Exit Meeting

At the conclusion of the inspection on October 21, 1993, an exit meeting was held with those licensee representatives indicated in Paragraph 1 of this report. The inspector summarized the inspection scope and discussed the apparent violation as well as the unresolved item described in the report and listed below. The licensee did not indicate any of the information provided to the inspectors during the inspection as proprietary in nature. During the exit, the licensee was not in agreement that a violation had occurred and requested clarification. After consultation with regional and headquarters staffs, a telephone call was made on October 26, 1993, involving the inspector and those individuals indicated in Paragraph 1. The licensee was informed that an apparent violation had occurred, at which point the licensee agreed to initiate corrective actions. On October 29, 1993, the licensee informed those individuals indicated in Paragraph 1 by telephone that corrective actions were initiated on October 28, 1993, mainly consisting of filing a formal request for approval with the Oconee Project Manager in Headquarters to implement Regulatory Guide 8.38, "Control of Access to High and Very High Radiation Areas in Nuclear Power Plants," dated June 1993, as an alternative method to 10 CFR 20.1601.

Item Number	Description and Reference
50-269, 270, 287/93-28-01	VIO - Failure to adequately control access to HRAs (Paragraphs 5.e).
50-269, 270, 287/93-28-02	URI - Procedural discrepancy involving Security access to three HRA keys (Paragraphs 5.e).