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Report Nos.: 50-338/94-12 and 50-339/94-12

Licensee: Virginia Electric and Power Company
Glen Allen, VA 23060

Docket Nos.: 50-338 and 50-339 License Nos.: NPF-4 and NPF-7

Facility Name: North Anna 1 and 2

Inspection Conducted: May 9-13, 1994

Inspector: Wade T. Loo 5/31/94
W. T. Loo Date Signed

Approved by: W. H. Rankin 5/31/94
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: audits and appraisals, changes to organization and staffing, training and qualifications of personnel, external and internal exposure control, control of radioactive materials and contamination, surveys and monitoring, and program for maintaining occupational exposures As Low As Reasonably Achievable (ALARA).

Results:

In the areas inspected, no violations or deviations were identified. Based on interviews with licensee personnel, records review, and observations of work activities in progress, the inspector found that the radiation protection program continued to adequately protect the health and safety of occupational radiation workers. External and internal exposures were maintained within regulatory and the licensee's administrative limits. The ALARA program continued to be effective in implementing dose reduction initiatives. Identified program strengths included radiation protection training for facility personnel, ALARA dose reduction initiatives and radioactive material

control with regards to aggressive housekeeping efforts by the licensee. In addition, during the onsite inspection, the licensee conducted a nuclear emergency preparedness (EP) drill for its upcoming annual exercise.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

E. Dreyer, Supervisor, Health Physics Technical Services
R. Evans, Supervisor, Health Physics Operations
H. Hay, Supervisor, Quality Assurance (QA)
*D. Heacock, Assistant Station Manager, Nuclear Safety and Licensing (NSL)
M. Johnson, Senior Quality Specialist, QA
L. Jones, Supervisor, Radiological Engineering
*J. Leberstien, Staff Engineer, NSL
S. Montgomery, Lead Instructor, Nuclear Employee Training
H. Moyers, Health Physics Shift Supervisor
T. Peters, Supervisor, Exposure Control
C. Smith, ALARA Coordinator, Radiation Protection (RP)
*J. Smith, Manager, Quality Assurance
*A. Stafford, Superintendent, RP
*J. Stall, Station Manager
*W. Thornton, Director, Corporate Health Physics and Chemistry Services

Other licensee employees contacted included engineers, technicians, and office personnel.

Nuclear Regulatory Commission

*R. McWhorter, Senior Resident Inspector
D. Taylor, Resident Inspector

*Attended May 13, 1994, Exit Meeting

2. Audits and Appraisals (83750)

10 CFR 20.1101(c) requires that the licensee periodically (at least annually) review the radiation protection program content and implementation.

Technical Specification 6.5.2.8 requires that audits of plant activities be performed under the cognizance of the Management Safety Review Committee and that the audits encompass, in part, the following: (a) the conformance of facility operation to provisions contained within the Technical Specifications and applicable licensee conditions; and (2) the performance of activities required by the Operational Quality Assurance Program to meet the criteria of Appendix B to 10 CFR Part 50.

a. Assessments

Through discussions between licensee representatives and the inspector and a review of records, the inspector determined that a Radiation Protection (RP) audit had not been conducted since the last inspection with the exception of one special audit conducted

by the licensee involving a locked high radiation area door. However, due to the nature and time of the incident, a review of this event was conducted by the NRC resident inspectors (RIs) and documented in Inspection Report (IR) 50-338, 339/93-30, dated December 19, 1993, to January 21, 1994. At the time of this onsite RP inspection the RIs were continuing to review the incident with licensee representatives as an unresolved item.

Through further discussions with licensee representatives and a review of records, the inspector was informed that an RP audit had been scheduled to be performed within the next few months. This RP audit would be conducted concurrently with Surry Nuclear Power Plant. Although a final audit checklist had not been completed licensee representatives informed the inspector that the upcoming RP audit would focus on: 1) National Voluntary Laboratory Accreditation Program (NVLAP) for the dosimetry program; 2) Radiation Work Permits (RWPs); and 3) 10 CFR Part 20 Implementation In addition, licensee representatives stated that other areas to be reviewed would include radioactive material and contamination control and housekeeping, radioactive material shipments, radiological area postings and surveys, respiratory protection, health physics training, and work activity observations of licensee personnel. Furthermore, a qualified auditor with health physics qualifications and experience was assigned to implement the licensee's assessment activities. Assisting the auditor would be four other individuals, including a corporate health physicist, with adequate knowledge and experience in ALARA, dosimetry and NVLAP accreditation, 10 CFR Part 20 revisions, licensing, and plant support and operations.

The inspector noted that the proposed focal areas for the upcoming RP audit appeared to be appropriate for evaluating the effectiveness of specific program areas. The inspector informed licensee representatives that the completed audit would be reviewed during future inspections.

b. Corrective Actions

The inspector reviewed the licensee's program for self-identifying and correcting deficiencies and weaknesses related to the RP program. Specifically, the inspector reviewed station Deficiency Reports (DRs) related to the RP area and noted that for the period October 1, 1993, through May 9, 1994, approximately 28 DRs had been identified by the licensee related to the RP program. For those selected DRs reviewed by the inspector no significant trends or indicators of RP problems were noted with the exception of the incident involving a locked high radiation area door as discussed above in Paragraph 2.a. For the cases reviewed, reports were properly documented and corrective actions were timely.

No violations or deviations were identified in this area.

3. Changes (83750)

a. Organization and Personnel

The inspector reviewed and discussed with licensee representatives changes made to the RP organization since the last NRC inspection of this area conducted September 27 - October 1, 1993, and documented in IR 50-338, 339/93-26, dated October 29, 1993. Cognizant licensee representatives stated that although a few minor personnel changes had been implemented, the overall reporting chain and management structure of the RP Program had remained unchanged.

The inspector noted that the licensee continued to maintain a health physics (HP) staff of approximately 89 to include HP supervisors, HP technicians (HPTs), HP specialists, decontamination technicians and clerical staff. At the time of the onsite inspection, the inspector was informed that one (1) HPT and one (1) clerk position were vacant. In addition, licensee representatives stated that two (2) permanent contractor technicians were maintained on staff to support RP, one individual for ALARA activities and another individual for HP Operations.

Overall, the inspector did not note any concerns regarding the RP organization and staffing. The RP organization and staffing levels continued to be appropriate, appeared stable and functioning adequately to support ongoing RP activities. The minor personnel changes noted by the inspector did not appear to adversely impact the conduct of RP activities.

No violations or deviations were identified in this area.

b. Policies and Procedures

The inspector reviewed selected RP policies and procedures and discussed those records with licensee representatives. Through those discussions and reviews of records, the inspector independently verified that the licensee made numerous revisions to policies and procedures to include incorporation of 10 CFR Part 20 revisions for compliance. The inspector informed licensee representatives that further review of policies and procedures for compliance with regards to 10 CFR Part 20 revisions would be conducted during future inspections.

No violations or deviations were identified in this area.

4. Planning and Preparation (83750)

Based on discussions between the inspector and licensee representatives, the inspector was informed that the licensee plans to schedule a Unit 1 Refueling Outage (RFO) to begin on or about September 9, 1994, and last for approximately 48 days. Through further discussions and a review of

records, the inspector noted that the licensee's ALARA program had tentatively established a projected exposure goal of approximately 230.784 man-rem. In addition, the licensee had projected that the most dose intensive activities to be conducted would involve the pressurizer and safety relief valve pipe support modifications and the removal and installation of insulation resulting in estimated doses of 20.413 and 22.000 man-rem, respectively. Furthermore, the licensee expects to observe some increased dose received from those activities involving the disassembly and reassembly of the reactor heads and the installation and removal of scaffolding resulting in estimated doses of 23.141 and 13.500 man-rem, respectively. At the time of the inspection licensee representatives were in the process of finalizing the dose goals and estimates and had not completed the final details for accomplishing ALARA initiatives to be conducted during the upcoming Unit 1 RFO. Licensee representatives stated that the exposure goals established at this time could even be further reduced once final details regarding Unit 1 RFO were completed. The inspector informed licensee representatives that these issues would be reviewed during future inspections.

No violations or deviations were identified in this area.

5. Training and Qualifications of Personnel (83750)

10 CFR 19.12 requires, in part, that the licensee instruct all individuals working in or frequenting any portion 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.

a. Nuclear Employee Training (NET)

The inspector discussed with licensee representatives and reviewed the licensee's program for providing RP training to licensee employees. Through those discussions and reviews the inspector noted that NET was divided into two sessions. The first session entitled "Station Policies and Procedures Orientation" was for all licensee employees lasting approximately 8 hours. This session included topics such as fire, safety, security, emergency plan basics, fitness for duty, and site orientation. In addition, individuals were administered a 50 question exam requiring a passing grade of 70%. The next session was divided into two areas. One area entitled "Indoctrination" was for individuals whose roles were more administrative in nature and not requiring routine access into the RCA. This session lasted approximately 3 hours and individuals were administered a 20 question written exam requiring a passing grade of 70%. This session was an overview of the principles of radiation protection. The other area entitled "Basic Radiation Worker Training" was for

individuals whose activities required routine access into the RCA or radiation areas such as craft personnel. This session lasted approximately 8 hours and individuals were administered a 50 question written exam requiring a passing grade of 70%. In addition to the written exam, the individuals would have to take a practical or "hands on" exam demonstrating that they were knowledgeable in radiation protection principles and practices. This session included more detail and specifics of the principles of radiation protection than the other session. Through further discussions between the inspector and licensee representatives, the inspector was informed that the licensee was going to combine the last two session areas into one second session for all licensee employees. This would establish a generic RP training program for all licensee employees and eliminate the need to distinguish which individuals required more RP training than others.

No violations or deviations were identified in this area.

b. HP Technician Continuing Training

The inspector reviewed the HP continuing training program. The inspector noted that the training program was designed to upgrade skills, as well as maintain employees knowledgeable of plant modifications and procedures, and familiarity with relevant industry experience and technological changes. The inspector was informed that topics to be reviewed were prepared from an "Annual Needs Assessments" survey conducted annually. The HP group provided their suggestions and recommendations for training topics during these surveys. Upon completion of the topic outline the licensee would prepare a training matrix categorizing topics into one of four cycles per year. Upon completion of each cycle an evaluation would be conducted by the training department in the form of either a written or practical exam when applicable.

The inspector reviewed the 1994 HP continuing training schedule and noted that 92 hours of scheduled training had been budgeted to include such topics as Release of Material for Unrestricted Use, Hot Particle, Breathing Air System, Exposure Control Survival Skills, Panasonic TLDs and 10 CFR Part 20. At the time of the inspection the training department had completed the first of four cycles and was in the middle of conducting the second cycle of training.

No violations or deviations were identified in this area.

c. Advanced Radiation Worker (ARW) Training

The inspector discussed and reviewed records with licensee representatives the ARW training program. The inspector noted that ARW training had been separated into two levels with Level 1 training geared towards workers requiring access to high radiation

areas (HRA) for the purpose of walkdowns, planning, minor testing, and sampling; whereas Level 2 was designed for workers requiring HRA access for the purpose of performing system or component maintenance in the area.

Through those discussions and reviews the inspector noted that the two day Level I training qualified workers to use selected radiation monitoring instrumentation to determine gamma radiation dose rates, to access HRAs and locked HRAs without continuous HP coverage, and to package and transport radioactive material in selected situations. In addition to these Level I tasks, during a three day training period, Level II workers were qualified to use selected radiation monitoring instrumentation to determine beta radiation dose rates, to obtain samples for determining airborne radioactivity concentrations, and to document radiological survey data on the appropriate HP forms. Licensee representatives stated that half of the training time was spent in the classroom covering fundamentals while the remainder of training involved practical and actual inplant exercises. A 50 question written exam specific for each level was administered to individuals requiring a passing grade of 70%. The inspector was informed that at the time of the onsite inspection, approximately 300 workers were ARW qualified. Of the 300 workers approximately 10% were Level I qualified while the remainder 90% were Level II qualified.

No violations or deviations were identified in this area.

The inspector noted that the licensee's training program appeared to contain appropriate radiation protection topics with knowledgeable, experienced and qualified training representatives, and considered a program strength to the overall RP program.

6. External Exposure Controls (83750)

a. Administrative Controls for External Exposures

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 the 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 individual organ or tissue other than the lens of the eye being equal to 50 rems; and

(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.

The inspector reviewed external exposure records and discussed those records with licensee representatives for selected plant and contract personnel for the years 1993 and 1994, to date. The inspector noted that for selected individuals the maximum exposure for 1993 was 3,470 millirem (mrem) and the maximum year to date exposure for 1994 was 176 mrem. Through further discussions between the inspector and licensee representatives and a review of records, the inspector determined that a radiation worker's quarterly administrative dose limit was established at 2.0 rem (TEDE). The annual administrative dose limit established for a radiation worker was established at 4.0 rem (TEDE). If a radiation worker received a quarterly or annual dose within 200 mrem of an administrative dose limit, the individual would be denied access to the RCA. In the event a radiation worker requested a dose extension the licensee would review the request and upon approval would grant an appropriate dose extension. The inspector reviewed exposure records for selected individuals with dose extensions and noted that the need for an extension was justified and verified that a completed Form-4 was on file with the individual having the necessary remaining lifetime exposure to exceed the quarterly regulatory limit. The inspector noted that the licensee had not granted any exposure extensions since January 1, 1994. The inspector concluded that for those selected records reviewed, the licensee monitored external exposures adequately and all were within 10 CFR Part 20 limits.

No violations or deviations were identified in this area.

b. Exposure to Skin

Procedure No. HP-6.1.20, "Personnel Contamination Monitoring and Decontamination", dated April 12, 1994, provides instructions for monitoring individuals for external contamination, decontaminating individuals, initiating skin dose calculations, and initiating follow-up actions.

The inspector reviewed selected cases of skin contaminations requiring the performance of dose assessment for the period October 1, 1993 through May 9, 1994. From the records reviewed, a maximum skin dose of 3.35 rem was assigned for a contractor who was double bagging equipment released off a hot particle step off pad during the Unit 2 outage. Based on those reviews of records, the inspector determined that the licensee's followup surveys and assessment activities for the selected cases were in accordance with approved procedures.

No violations or deviations were identified in this area.

c. Personnel Dosimetry

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

(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 HRA.

The inspector selectively reviewed the licensee's dosimetry program and noted that the licensee continued to provide thermoluminescent dosimeters (TLDs) to individuals requiring personnel monitoring. The licensee used the TLD for primary monitoring and utilized digital alarming dosimeters (DADs) for secondary monitoring. Personnel TLDs were read quarterly and the results served as the official dose record. DADs were read upon exiting the RCA and served as a means for tracking individual's cumulative exposure on a day-to-day basis. During tours of the plant, the inspector observed proper use of TLDs and DADs by licensee employees and contractors although the licensee had previously experienced improper use of DADs as discussed in Paragraph 12.

No violations or deviations were identified in this area.

d. Radiation Work Permits (RWPs)

The inspector reviewed selected external exposure records for workers involved with Radiation Work Permit (RWP) No. 93-2-2210 associated with the removal and replacement of insulation in support of the Unit 2 RFO and HP coverage of such activities. For the selected records reviewed the maximum whole body, skin, and extremity doses during the fourth quarter for the year 1993 were 1.416 rem, 1.517 rem, and 1.517 rem, respectively. The inspector noted that individuals had exceeded 1.25 rem to the whole body in a calendar quarter. Following further review the inspector independently verified that the licensee had documentation of the individuals' prior exposure on an NRC Form-4 and had appropriately granted the individuals an exposure extension based on annual and lifetime cumulative exposures.

In addition, the inspector reviewed selected RWPs for appropriateness of the radiation protection requirements based on work scope, location, and conditions. The inspector noted and

reviewed initial survey results for initiation of special RWPs. The inspector also noted that the RWPs were being appropriately initiated and terminated based on job scope. For the RWPs reviewed, the inspector noted that radiological concerns were appropriately addressed in that appropriate protective clothing, respiratory protection, and dosimetry were required. During facility tours the inspector observed the adherence of plant workers to RWP requirements and discussed the RWP requirements with plant workers at the job site. The inspector found the workers to be knowledgeable of RWP requirements and their responsibilities to comply with those requirements. Furthermore, the inspector found the licensee's program for RWP implementation to adequately address radiological protection concerns, and to provide for proper control measures.

No violations or deviations were identified in this area.

e. Posting and Labeling

During tours of the plant and selected outside radioactive material storage areas, the inspector noted that the licensee's posting and control of radiation areas, high radiation areas, airborne radioactivity areas, contamination areas, and radioactive material areas, was adequate.

No violations or deviations were identified in this area.

f. Notices to Workers

10 CFR 19.11(a) and (b) require, in part, that the licensee post current copies of 10 CFR Part 19, Part 20, the license, license conditions, documents incorporated into the license, license amendments and operating procedures, or that a licensee post a notice describing these documents and where they can be examined.

10 CFR 19.11(d) requires that a licensee post NRC Form-3, Notice to Employees. Sufficient copies of the required forms are to be posted to permit licensee workers to observe them on the way to or from licensed activity locations.

During tours of the licensee's facility the inspector independently verified that Form NRC-3 and notices referencing the appropriate 10 CFR Part 19 and Part 20 and licensee documents were posted in accordance with the applicable regulation. Specifically, the inspector noted that the documents were posted at the main access control building entrance to the licensee's protected area and RCA access point entrance. The inspector determined that the forms were posted in adequate locations to be viewed by all personnel on their way to licensed activities.

No violations or deviations were identified in this area.

7. 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).

10 CFR 20.1502(b) requires each licensee to monitor the occupational intake of radioactive material by and assess the CEDE 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.

a. Respiratory Protection

Through discussions with licensee representatives, the inspector determined that for the year 1993, approximately 3,669 respirators had been used. For the year 1994 to present, the licensee had not used any respirators. The licensee indicated that they were continuing to decrease the use of respirators by not using respirators in those areas where respirators had been previously used. The licensee stated that based on past air sampling history those areas where respirators had been used respirators were not needed due to the low potential of airborne particulates in those areas. As a result of decreased respirator use the licensee observed an increase in facial personnel contamination events (PCEs); however, the licensee did not observe any positive whole body counts during this period of time as discussed in Paragraphs 7.c and 10.d. Based on those reviews and discussions with licensee representatives, the inspector determined that the licensee had made significant efforts to maintain TEDE exposures ALARA.

No violations or deviations were identified in this area.

b. Engineering Controls

During discussions with licensee representatives the inspector was informed that during the 1993 Unit 2 outage the licensee made efforts to decrease respirator usage and expand engineering controls to limit airborne radioactivity concentrations to include the use of oil cloths to control loose surface contamination and hot particle migration. The inspector informed licensee

representatives that their initiatives in reducing radiation exposures through decreased respirator usage and increased engineering controls during potential airborne radioactivity activities were considered enhancements to the exposure control program to maintain TEDE exposures ALARA.

No violations or deviations were identified in this area.

c. Whole Body Counting and Exposure Tracking

10 CFR 20.1204 stated 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 CEDE.

The inspector reviewed selected records of whole body counts (WBCs) performed by the licensee since October 1, 1993. Through those reviews of records and discussions with licensee representatives, the inspector determined that for the year 1993 the licensee had conducted 4,178 WBCs. Of those WBCs the licensee did not observe any positive ones. Furthermore, from January 1 to May 13, 1994, the licensee continued to not observe any positive WBCs. Although the licensee continued to reduce respirator usage and had an increase in facial PCEs no increase in positive WBCs was observed. No concerns were noted by the inspector based on those review of records and discussions.

No violations or deviations were identified in this area.

8. Planned Special Exposures (83750)

10 CFR 20.1206 permits the licensee to authorize an adult worker to receive doses in addition to and accounted for separately from the doses received under the limits specified in 10 CFR 20.1201 provided that certain conditions are satisfied. Such exposures cannot exceed the dose limits in 10 CFR 20.1201(a) in any year or five times the annual dose limits during an individual's lifetime.

Section 6.5 of Procedure No. HP-1031.020, "Administrative Dose Control", dated January 1, 1994, provides instructions to implement the administrative dose controls established in VPAP-2101, "Radiation Protection Plan", Revision 5, dated December 6, 1993, for initiating Planned Special Exposures (PSE) requests for facility workers. Through discussions with licensee representatives and a review of records, the inspector determined that the licensee had appropriate procedural

guidance for allowing PSEs. Through further discussions with licensee personnel, however, the inspector was informed that as a plant policy the licensee did not plan to use PSEs.

No violations or deviations were identified in this area.

9. Dose to the Embryo/Fetus and Exposures of Declared Pregnant Women (83750)

10 CFR 20.1208(a) requires that the dose to the embryo/fetus not exceed 500 mrem during the entire pregnancy due to occupational exposure of a declared pregnant woman.

Section 6.4 of Procedure No. HP-1031.020, "Administrative Dose Control", dated January 1, 1994, provides instructions to implement the administrative dose controls established in VPAP-2101, "Radiation Protection Plan", Revision 5, dated December 6, 1993, for facility female workers who become pregnant and complete a Voluntary Declaration of Pregnancy form. During the inspection the inspector interviewed one Declared Pregnant Woman (DPW) concerning the licensee's program for DPWs. Through those discussions with the DPW, the DPW appeared to be knowledgeable of the licensee's requirements in this area. Through further discussions with the DPW and licensee representatives and a review of records, the inspector determined that the DPW had previously been in a position that required access to the RCA on a daily basis. Upon voluntary declaration of her pregnancy, the licensee transferred the DPW to a position that would not require access to the RCA yet allowed the DPW to perform licensed activities in a different capacity. The inspector reviewed exposure records for the DPW and verified that the licensee appropriately limiting the individual's dose in accordance with policies, procedures and NRC requirements. No concerns were noted with the licensee's declared pregnant woman policy or procedures.

No violations or deviations were identified in this area.

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

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.

10 CFR 20.1904(a) requires the licensee to ensure that 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 radionuclides present, and the estimate of the quantity of radioactivity, the kinds of materials and mass enrichment) to permit individuals handling or using the containers, to take precautions to avoid or minimize exposures.

a. Control of Radioactive Material

During plant tours, the inspector observed very good housekeeping and contamination control practices. The inspector noted that the licensee's posting and control of radiation areas, high radiation areas, airborne radioactivity areas, contamination areas, radioactive material areas, and the labeling of radioactive material was adequate. In addition, the inspector reviewed survey records and verified that the licensee was performing routine surveys of radioactive materials areas and checks of labels on radioactive material containers stored in outside storage areas. Furthermore, the inspector observed HPTs in the plant monitor worker activities in their assigned locations, make radiation and contamination surveys and advise workers on appropriate radiological protection procedures.

No violations or deviations were identified in this area.

b. Surveys

Procedure No. HP-1032.030, "Radiation Surveys", dated January 1, 1994, provides instructions for performing radiation surveys to determine radiation levels within Station Radiologically Controlled Areas, Protected Area or Controlled Area and for response to non-routine situations which may be encountered during performance of radiation surveys.

The inspector reviewed selected records of routine and special radiation and contamination surveys performed in 1994 and discussed the survey results with licensee representatives. Evaluation of selected surveys posted at the RCA entrance found them to be current and appropriately documented. During facility tours, the inspector noted the supplemental surveys to be informative and consistent with the data posted at the RCA entrance.

During tours of the plant, the inspector independently verified radiation and contamination levels in various auxiliary building locations and other areas of the RCA. In addition, the inspector observed HP technicians performing radiation and contamination surveys. The inspector noted that in all cases, areas were posted in accordance with the radiation hazards present. Furthermore, no concerns with the adequacy or frequency of the radiological survey activities were identified.

No violations or deviations were identified in this area.

c. High Radiation Areas

Procedure No. HP-1032.060, "Radiological Posting and Access Control", dated January 1, 1994, provides instructions for posting radiological areas and implementing access controls to high

radiation areas, based on results of radiological surveys. Procedure No. HP-1032.061, "High Radiation Area Key Control", dated January 1, 1994, provides instructions to HP Operations for verifying entry requirements, determining key type, issuing and accounting for keys to locked High Radiation Areas.

During tours of the Auxiliary, Waste Processing, and Fuel Handling Buildings the inspector observed and independently verified that all HRAs were locked and/or posted as required. During discussions with licensee representatives and a review of records, the inspector determined that the HP Shift Supervisor (HPSS) for the HP control point maintained a shift turnover logbook and checklist. During each shift turnover, the HPSS would conduct an inventory for each of the Locked HRA keys for accountability and control. The keys to each of the Locked HRAs were maintained in a locked box on a wall at the HP control point. In addition, the licensee maintained records for each time a Locked HRA key was checked out and in to ensure adequate key control for the Locked HRAs.

No violations or deviations were identified in this area.

d. Area and Personnel Contamination

The licensee maintained approximately 96,726 square feet (ft^2), excluding containment, as radiologically controlled. As of May 13, 1994, the contaminated area tracked by the licensee was approximately 250 ft^2 which was contaminated due to radioactive material decontamination activities. During facility tours, the inspector observed a very clean plant, good material control, and overall excellent housekeeping practices. Surface contamination was aggressively being controlled at its source. This included an aggressive "No Leak" policy by the licensee in which any leak found in the plant would be immediately contained and given high priority for repair.

The inspector reviewed monthly Personnel Contamination Events (PCEs) reports documented by the licensee for the year 1993 to present. For the year 1993, the licensee met their goal of 261 PCEs with a total of 236 occurrences. Of the 236 PCEs documented by the licensee, 86 involved facial contaminations and 147 involved clothing contaminations. Of the 236 PCEs, 14 involved hot particles for skin and clothing contaminations. For the year 1994 to present 7 PCEs had occurred. Although the overall goal for PCE occurrence was met, an increase in the number of head, face, and neck contaminations was experienced. As discussed in Paragraph 7.a, this was primarily attributed to decreased respirator usage as well as increased outage work scope. Furthermore, the licensee did not observe any positive whole body

counts as discussed in Paragraph 7.c. Review of selected contamination events noted that licensee documentation and follow-up on the individual events were appropriate, and skin dose assessments were performed, when required as discussed in Paragraph 6.b. For reports reviewed, resultant exposures were minor and not significant.

No violations or deviations were identified in this area.

e. Radiation Detection and Survey Instrumentation

During tours of the plant, the inspector noted that portable radiation detectors, air samplers, and friskers and contamination monitors had up-to-date calibration stickers and had been source-checked as required. In addition, the licensee appeared to possess an adequate number of operable survey instruments and related equipment. Furthermore, background radiation levels at survey locations were observed to be within an acceptable range.

No violations or deviations were identified in this area.

The inspector noted that the licensee maintained very good housekeeping and contamination practices regarding the control of radioactive material throughout the licensee's facility to include the auxiliary and turbine building and was considered to be a program strength to the overall RP program.

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

10 CFR 20.1101(b) requires that the 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 ALARA.

The inspector reviewed the license's program to maintain occupational exposures ALARA. During discussions with licensee representatives the inspector was informed that the cumulative radiation exposure for 1993 was approximately 979.148 man-rem which did not exceed the licensee's end of year radiation exposure goal of 1,065.408 man-rem. In particular, during 1993 the licensee conducted two scheduled outages, one for each unit contributing 947.181 man-rem. Also, the licensee experienced two forced outages involving a leaking test connection on a reactor coolant pump and feedwater line oscillations contributing 5.512 man-rem. At the time of the onsite inspection the licensee had accrued approximately 11.727 man-rem, with approximately 7.5 months remaining in the calendar year. The licensee's end of year radiation exposure goal for 1994 was 268.503 man-rem. Based on the inspector's review of the 1993 outage work scope and associated exposures, the licensee was informed that their program for maintaining personnel exposures ALARA during outage activities appeared to be functioning adequately. The inspector also reviewed the ALARA suggestions with

licensee representatives and found that the licensee had received 14 ALARA suggestions for the period October 1993 to present. For the year 1993 the licensee received a total of 36 ALARA suggestions. Of the 36 ALARA suggestions received in 1993, 8 were accepted, 17 were rejected, and 11 were under evaluation by the Station Alara Committee (SAC). For the year 1994 only one ALARA suggestion had been received by the licensee. The inspector reviewed the SAC meeting minutes and determined that for the year 1993 to present, the SAC met on a monthly basis and reviewed those plant activities that involved RWPs with greater than 10 man-rem exposure projections. In addition, for each quarter when there were five or more approved ALARA suggestions, the SAC would select one from those approved as the "ALARA Suggestion for the Quarter" and reward the individual with some monetary award. The inspector discussed with licensee representatives the 1994 ALARA suggestion related to the replacement of ventilation piping elbows on the reactor heads. The ALARA Suggestion and Evaluation discussed and evaluated the cost-benefit analyses for performing this activity using a different engineering design for replacing the elbows. Based on the ALARA Suggestion Evaluation, the estimated net annual man-rem saved would be approximately 0.600 man-rem as well as man-hour savings expended to perform the job activity. Licensee representatives stated that they were still reviewing piping engineering designs to implement this suggestion.

In addition, the inspector reviewed and discussed the licensee's Source Term Reduction Activities to include stellite valve replacements, reduced micron filtration, hot spot flushing and auxiliary building dose rate trending. With regards to reduced micron filtration, the inspector noted that the licensee's Sub-Micron Filtration program reached optimum non-outage filtration size for the letdown, refueling purification, and boric acid filters in which 24 filters were changed out during 1993. In addition, the inspector was informed by licensee representatives that 60 hot spots were flushed during 1993 removing approximately 246.8 Rem/hour of source term at the licensee's facility. At the time of the inspection the inspector was informed by licensee representatives that a Hot Spot program was being developed and revised to further reduce source term at the licensee's facility. The inspector noted that these initiatives appeared to be beneficial in maintaining calendar year and outage exposures essentially as projected.

The inspector noted that the activities of the ALARA staff with the apparent support of site management appear to be advancing the effectiveness of the sites ALARA program and was considered a program strength in the overall RP program.

No violations or deviations were identified in this area.

12. Effectiveness of Licensee Controls (83750)

Through discussions between the inspector and licensee representatives and a review of records, the inspector noted that the licensee prepared quarterly RP self-assessment reports. Upon review of each program area,

each area was assigned a rating factor: 1.0 - Program Strength, 1.5 - Satisfactory, and 2.0 to 2.5 - Improvement Needed. Of the program areas reviewed, Program Strengths identified by the licensee were RP Organization and Administration, Training, ALARA, Respiratory Protection, Contamination Control and Radioactive Material Control. Program areas identified as Satisfactory were Instrumentation, RWPs and Internal Exposure. Program areas identified as Improvement Needed were Personnel Performance and Dosimetry.

One of the program areas identified by the licensee as Improvement Needed was Personnel Performance. With regards to Personnel Performance, one area of focus related to RCA entries with DADs in the "Pause" mode. During the last Unit 2 RFO several individuals entered the RCA with their DADs in the "Pause" mode. Upon review of these incidents the licensee determined that the individuals did not verify that their DAD was in the proper operational mode prior to removing it from the dosimeter reader. In addition, the licensee determined that the operation of the dosimeter reader allowed the individual to remove the DAD from the reader prior to completion of processing. However, in every incident, the individuals were wearing TLDs which were processed and the results indicated that no administrative exposure limits were exceeded in any case. The licensee's immediate corrective actions involved the counseling of those individuals on the importance of proper issuance of DADs, a "Station Alert" was issued depicting the correct dosimeter display configuration, and RP personnel were posted at the entrance to the RCA to check facility personnel DADs prior to entry into the RCA. The licensee's long term corrective actions included a modification to the dosimeter reader software program. The software modification caused the DAD to alarm if it were removed in the "Pause" mode prior to the completion of processing. In addition, the dosimeter reader would prompt to a screen to ensure that individuals have read their RWP and understand its requirements prior to entry into the RCA.

No violations or deviations were identified in this area.

13. Exit Meeting (83750)

At the conclusion of the inspection on May 13, 1994, an exit meeting was held with those licensee representatives indicated in Paragraph 1 of this report. The inspector summarized the scope and findings of the inspection and indicated that no apparent violations or deviations were identified. The licensee did not indicate any of the information provided to the inspector during the inspection as proprietary in nature and no dissenting comments were received from the licensee.