



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

JAN 20 1988

Report No.: 50-280/87-35 and 50-281/87-35

Licensee: Virginia Electric and Power Company
 Richmond, VA 23261

Docket Nos.: 50-280 and 50-281

License Nos.: DPR-32 and DPR-37

Facility Name: Surry 1 and 2

Inspection Conducted: December 7-11, 1987

Inspector: *F. N. Wright*
 F. N. Wright

11/21/88
 Date Signed

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

1/21/88
 Date Signed

SUMMARY

Scope: This was a routine unannounced inspection in the areas of previous enforcement matters, internal exposure control, control of radioactive material, solid wastes, transportation, NRC Information Notices, allegations, and occupational exposure during extended outages.

Results: One violation was identified: failure to adhere to radiation control procedures.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

- H. L. Anglin, Assistant Supervisor, Health Physics
- *D. L. Benson, Station Manager
- M. R. Beckham, Assistant Supervisor, Health Physics
- E. E. Bick, Senior Instrument Technician
- H. D. Collar, Supervisor, Quality Assurance
- W. N. Cook, Operations Supervisor, Health Physics
- D. W. Densmore, Assistant Supervisor, Health Physics
- R. C. Early, ALARA Technician, Health Physics
- C. E. Foltz, Jr., Assistant ALARA Supervisor, Health Physics
- *B. Garber, Health Physics Supervisor
- *E. S. Grechelk, Assistant Station Manager, Nuclear Safety and Licensing
- *G. D. Miller, Licensing Coordinator, Safety Engineering Staff
- *A. Price, Quality Assurance Manager
- *S. P. Sarver, Superintendent, Health Physics
- *E. A. Schnell, Superintendent, Health Physics (Corporate)

Other licensee employees contacted included technicians and mechanical maintenance personnel.

*Attended exit interview

2. Exit Interview (30703)

The inspection scope and findings were summarized on December 11, 1987, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings listed below. Dissenting comments were not received from the licensee. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector during this inspection.

<u>Item Number</u>	<u>Status</u>	<u>Description/Reference Paragraph</u>
50-280, 281/87-35-01	Open	Violation - Failure to control radioactive material in accordance with licensee procedures (Paragraph 4).
50-280, 281/87-35-02	Open	Unresolved Item* - Failure to identify potential violations of 10 CFR 20 requirements in licensee

*Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations.

		Quality Assurance Audits and Surveillance as findings requiring corrective action (Paragraph 4).
50-280, 281/87-35-03	Open	Inspector Followup Item (IFI) - Review criteria for initiating investigations of dose abnormalities (Paragraph 4).
50-280, 281/87-35-04	Open	IFI - Review controls for misplaced, dropped or offscale self reading pocket dosimeters (Paragraph 4).
50-280, 281/87-35-05	Open	IFI - Review licensee controls for health physics procedures (Paragraph 4).
50-280, 281/87-24-02	Closed	Violation - failure to perform quality control checks on the whole body counter (Paragraph 3).

3. Licensee Action on Previous Enforcement Matters (92702)

(Closed) Violation (50-280/87-24-02 and 50-281/87-24-02). Failure to perform quality control checks on the whole body counter. The inspector reviewed the licensee's response dated September 25, 1987, and verified that the corrective action specified in the response had been taken.

4. Occupation Exposure During Extended Outages (83729)

a. Unit 2 Snubber Outage

The licensee took the unit two reactor offline on December 8, 1987, after a utility record of 248 straight days on line. The unit was taken offline for a 12 day outage to include work on snubbers and miscellaneous valves, repair a cracked letdown line, repair a residual heat removal RHR pump and motor, and replace a containment ventilation fan. The outage, originally scheduled to begin in October, had been delayed due to unplanned outages at other utility facilities. The licensee brought in approximately 40 contract health physics technicians to support the outage work. Containment vacuum was broken on December 9 and preparations for containment work, surveys, shielding, and the positioning of equipment began that afternoon.

The stations ALARA man-rem goal was set for 719 man-rem. The licensee had about 600 man-rem total before the outage work began and had set an outage goal of about 60 man-rem. The licensee expected

the RHR pump and motor replacement to be the highest dose task for the outage which was projected to account for about 6 man-rem.

No violations or deviations were identified.

b. Unit Two Containment

The inspector accompanied two mechanical maintenance personnel and a contract health physics technician into the licensee's unit two containment building to observe a gasket replacement on a chemical volume control system (CVCS) valve. Radiation Work Permit (RWP) 87-RWP-2161 had been prepared for the gasket replacement task. The gasket replacement involved three crafts: the insulators who had already removed the insulation, the electricians who had also disconnected valve controller cable and the mechanical maintenance personnel who would open the valve and replace the gasket. The inspector reviewed the radiation work permit requirements for appropriateness based on the work scope, location, and conditions and verified that the RWP had been properly approved.

10 CFR 20.1c states that persons engaged in activities under licenses issued by the NRC should make every reasonable effort to maintain radiation exposures as low as reasonably achievable (ALARA). The recommended elements of an ALARA program are contained in Regulatory Guide 8.8, Information Relevant to Ensuring that Occupational radiation Exposure at Nuclear Power Stations will be ALARA, and Regulatory Guide 8.10, Operating Philosophy for Maintaining Occupational Radiation Exposures ALARA.

An ALARA job briefing had been conducted with the licensee employees working on the CVCS valve the previous day. The inspector reviewed the ALARA prejob briefing documentation and ALARA job requirements for the valve work. The inspector determined through interviews with the mechanical maintenance workers, assigned to the task, that the mechanical maintenance section had also discussed job requirements again that morning to ensure all of the needed tools and equipment were in hand prior to entry into containment.

10 CFR 20.103(a) established the limits for exposure of individuals to concentrations of radioactive materials in air in restricted areas. This section also requires that suitable measurements of concentrations of radioactive materials in air be performed to detect and evaluate the airborne radioactivity in restricted areas and that appropriate bioassays be performed to detect and assess individual intakes of radioactivity.

10 CFR 20.103(c)(2) requires that the licensee maintain and implement a respiratory protection program that includes, as a minimum, written procedures regarding supervision and training of personnel, issuance records, and evaluation by a physician prior to initial use of

respirators, and at least every 12 month thereafter, that the individual user is physically able to use the respiratory protective equipment.

10 CFR 20.201(b) requires each licensee to make or cause to be made such surveys as maybe necessary for the licensee to comply with the regulations and are reasonable under the circumstances to evaluate the extent of radiation hazards that my be present. 10 CFR 20.401(b) requires a licensee to maintain records slowing the results of surveys required by 20.201(b).

The inspector was not respirator qualified by the licensee and was not allowed to wear a respirator or enter containment on 87-RWP-2161. The inspector was able to observe all work from a distance on another radiation work permit written for inspections inside containment. The valve work area was approximately twenty foot away from the inspector who was located directly under a containment ventilation exhaust duct. Radiation surveys and surveys of radioactivity in air were made in the inspector's observation area. The inspector observed the licensee maintenance employees wearing respirators unbolt and lift the valve bonnet from the valve seat, remove the gasket, take seal measurements, and lower the valve bonnet onto its seat. The task was efficiently completed in minutes. The valve was not put back together since the gasket was not to be replaced until the licensee had reviewed the seal measurements made by the maintenance workers later that day. While the mechanical maintenance personnel were working on the valve the health physics technician monitored the workers activities. The inspector observed the health physics technician performing direct gamma and beta radiation surveys of the valve internals and surrounding area, smearable contamination surveys of the valve internals, and airborne radioactive material surveys. The inspector reviewed the results of surveys made by the health physics technician covering the job and verified that the survey records were properly completed. The air sample results showed the air activity to be well below the concentrations required to calculate maximum permissible concentration hours (MPC-Hours).

The inspector reviewed licensee procedure RPM-7, Full Face Respirators Issuance Wearing and Removal, dated June 1, 1978. The training records, respirator fit test data, and medical qualifications for workers who had worked on 87-RWP-2161 were reviewed by the inspector and verified that all required training and medical evaluations had been completed and documented. The inspector toured all elevations of containment and made independent radiation surveys of radiation and high radiation areas. The inspector observed the use of lead shielding in various locations and the use of portable continuous air samplers. During the tour the inspector observed employees checking valve alignments and making preparations to drain systems.

No violations or deviations were identified.

c. Control of Radioactive Material

Technical Specification 6.4.D requires that radiation control procedures be followed.

Licensee Procedure HP 2.3, Contaminated Equipment and Component Control, revision dated February 2, 1987 specifies the requirements for moving and storing radioactive material and contaminated equipment.

During tours of the fuel building, yard buildings, and auxiliary building, the inspector observed stored radioactive material in accordance with the requirements of HP 2.3. While touring the basement of the auxiliary building the inspector discovered a gang box which was unlocked. The inspector opened the box and found several open yellow poly bags with a radiation symbol and the words "Caution Radioactive Material" printed on the sides. The area was not posted as a radioactive materials area and the gang box was not labeled. The inspector determined that Health Physics representatives were unaware that contaminated material was being stored in the gang box. The inspector asked licensee representatives to survey the gang box contents. The bags contained leak rate test equipment typically utilized by the operations section. Survey results showed several items in the gang box and the bags to be contaminated with Cobalt-60, Cesium-137 and Cesium-134. The highest contaminated item was a small tool box inside the gang box having 7000 disintegrations per minute per 100 square centimeters (dpm/100cm²). The inspector determined that the contaminated equipment in the gang box lacked sufficient quantity of radioactive material to meet the posting requirements of 10 CFR 20.203(e). However, Section D of licensee procedure HP 2.3 specifies the storage requirements for contaminated material and requires the following:

- ° Before storing any equipment or components which were present in the Restricted Controlled Area, smears must be taken to establish current levels.
- ° Equipment exceeds 1 mR/hr at one inch or 2200 dpm/100cm² must posted and/or wrapped and tagged
- ° Health Physics must be notified of any storage to be made under this part.

The inspector stated that failure to establish the contamination levels of the equipment, to wrap and tag as required, and to notify the health physics section of the equipment storage as required by Licensee Procedure HP 2.3 was an apparent violation of Technical Specification 6.4.D (50-280/87-35-01 and 50-281/87-35-01).

d. Audits

The inspector discussed the audit and surveillance program related to radiation protection, radioactive waste management, and transportation of radioactive material with licensee representatives. The inspector reviewed the following audits and surveillances:

Audit-S 87-17, Process Control Program/Offsite Dose Calculation Manual, May 27 - July 23, 1987

Audit-S 87-19, Health Physics and Environmental Monitoring, April 21 - July 13, 1987

Surveillance - SAC 20A, Dose Control Record Respiratory Protection, April, 1987

Surveillance - SAL 20B, Health Physics Contamination Monitoring Station Required Posting of Radiation Areas and Housekeeping, October, 1987

Surveillance - SAC 20C, Radiation Work Permits, June, 1987

10 CFR 20.103(b) requires that when it is impracticable to apply process or engineering controls to limit concentrations of radioactive material in air below 25 percent of the concentrations specified in 10 CFR 20, Appendix B, Table 1, Column 1, other precautionary measures should be used to maintain the intake of radioactive material by an individual within seven consecutive days as far below 40 Maximum Permissible Concentration (MPC)-hours as is reasonably achievable.

10 CFR 20.103(c)(2) provides that the licensee may make allowance for the use of respiratory protective equipment in estimating exposures of individuals to radioactive material in air provided the licensee maintains and implements a respiratory protection program that includes, as a minimum: written procedures regarding supervision and training of personnel and issuance records; written procedures regarding selection, fitting and maintenance of respirators; and determination by a physician prior to initial use of respirators, and at least every 12 months thereafter, that the individual user is physically able to use the respiratory protective equipment.

Audit S 87-19 reported that the auditor had selected 20 individuals from a respirator issuance log to verify the qualifications for issuance were being met. Licensee procedures require respirator users to have a medical evaluation, respirator fit test, respirator training, and a whole body count within the previous 12 months. The audit report stated that the auditor was unable to find the records for several names selected from the respirator issuance log. The item was presented in the report as a

concern and the names of the persons with missing records were listed. The report recommended the licensee reevaluate the method used to verify personnel status prior to issuing a respirator. The inspector discussed the audit concern with the Radiation Protection Manager. The inspector determined that the respirator qualification records had not been found as of December 10, 1987, but that a thorough search had not been made for the records. The inspector stated that failure to have respirator qualifications for persons issued respirators was an apparent violation of 10 CFR 20.103(c)(2) and requested the records be located if possible. The licensee was able to produce records for the individuals identified in the audit report before the exit meeting and the inspector reported to licensee management that the audit finding did not appear to be a violation of 10 CFR 20.103(c)(2) requirements. The inspector stated that the licensee's failure to identify a potential violation of 10 CFR 20 requirements as an item deserving immediate attention and documented corrective action could be a violation of the licensee's quality assurance program. However, the inspector did not have sufficient inspection time to evaluate the licensee's corrective action program for quality assurance findings. Therefore, this item is considered unresolved pending review of the area by the inspector during a future inspection (50-280/87-35-02 and 50-281/87-35-02).

No violations or deviations were identified.

e. Control of High Radiation Areas

Technical Specification (TS) 6.4.B.1 requires the entrance to each high radiation area in which the intensity of radiation is greater than 100 millirem per hour but less than 1000 millirem per hour be barricaded and conspicuously posted and that the entrance to each high radiation area in which the intensity of radiation is equal to or greater than 1000 millirem per hour shall be provided with locked barricades to prevent unauthorized entry into these areas.

During tours of containment, yard, and the auxiliary building, the inspector performed independent radiation surveys with NRC and licensee survey instruments, reviewed records of licensee radiation surveys, observed area postings, surveyed the exposure rate at various radiation boundaries, and checked the security of selected locked high radiation areas. The inspector determined that the areas were being properly controlled.

No violations or deviations were identified.

f. Portable Survey Instruments

While touring the licensee facilities the inspector examined portable radiation survey instruments and air sampling equipment in use to verify that each had a calibration sticker. Each instrument examined had a calibration sticker and no instruments were found in use with expired calibration due dates. The inspector recorded the serial numbers of several instruments and later reviewed the calibration

data packages and calibration procedures for the instruments. The inspector reviewed the licensee's records tracing radiation sources to National Bureau of Standards (NBS) and also verified mechanical and test equipment (laminar flow elements, pressure gauges, etc.) utilized to verify flow rates on air sampling equipment were calibrated and tracable to NBS.

No violations or deviations were identified.

g. Dosimetry

10 CFR 20.202 requires each licensee to supply appropriate personnel monitoring equipment to specific individuals and require the use of such equipment. During tours of the licensee's facility the inspector observed workers wearing appropriate personnel monitoring devices.

The inspector reviewed an individual's occupational exposure report issued by the licensee for the second quarter of 1987. The occupational exposure report had assigned an exposure of 0.007 rem to the whole body, 0.125 rem to the skin, and 0.125 rem to the extremity. The dosimetry supervisor was aware of the unusual exposure ratio. The inspector determined that the licensee had not been able to explain the unusual ratio of shallow to deep dose for the individual and conservatively assigned the exposure reported from the TLD readout. The licensee response checked the specific TLD upon the inspector's request and no abnormalities were found. The individual assigned the TLD had not worked in the radiation control area during the period that the TLD response was reported. The inspector determined that the licensee did not have criteria or guidelines in procedures to require an investigation of unusual personnel monitoring results, for example, unusual beta to gamma measurement ratios. Licensee representatives agreed to establish criteria and guidelines that would cause an abnormal exposure report to be investigated and documented. The inspector stated that a review of the development of the criteria and guidelines utilized to investigate and document abnormal occupational exposure reports would be identified as an inspection followup item (50-280/87-35-03 and 50-281/87-35-03).

The licensee issued self reading dosimeters (SRD's) to persons entering the radiation control area (RCA). The SRD's were drift and responded tested prior to initial issue and at six months intervals thereafter when in service in accordance with HP-3.1.4.2 Personnel Dosimetry - SRD Testing and Preparation dated October 9, 1986. Through interviews with licensee representatives the inspector determined that the licensee conducts an undocumented leak test on SRD's that have been dropped, found, or turned in off-scale. Licensee representatives agreed to revise SRD procedures to segregate dropped, found, or off-scale SRD's and process those SRD's through the documented leak rate and response test as described in

HP-3.1.4.2. The inspector stated that the procedures to test off-scale, dropped, and found SRD's would be reviewed in a future inspection as an inspector followup item (50-280/87-35-04 and 50-281/87-35-04).

No violations or deviations were identified.

h. Procedures

As part of the corrective action for violation 87-35-01 the licensee committed to revise procedure HP-5-2B-50 Whole Body Counter Operation - Chair/ND680, revision dated March 4, 1986, to address verification of quality control checks for the whole body counter (WBC). The inspector determined that the procedure manual utilized by the operators of the WBC equipment still contained, revision dated March 4, 1986. Licensee representatives had the newly revised HP-5-2B-50 procedure, revision dated October 14, 1987 in a reading file for employee review. The inspector verified that a majority of those persons assigned to the dosimetry section had reviewed the new procedure. The inspector determined that the procedures in the whole body count/dosimetry laboratory were not controlled procedures issued by the document control section and that the health physics section had two controlled manuals of health physics procedures. The licensee health physicist was copying the controlled procedures and forwarding them to the various health physics groups. Licensee representatives agreed that the working copies of health physics procedures should be current and agreed to have the health physics procedures controlled by a formal receipt/acknowledgement program to ensure copies of procedures were current. The inspector stated that the licensee's controls of health physics procedures would be reviewed in a future inspection as an inspector followup item (50-280/87-35-05 and 50-281/87-35-05).

No violations or deviations were identified.

5. Solid Waste (84722)

10 CFR 20.203 (e) requires that each area or room in which licensed material is used or stored in excess of 10 times the quantity of the material listed in Appendix C be posted as a radioactive materials area. During tours of the low level radwaste storage facility, the waste compactor area, and various waste storage areas, the inspector verified that radioactive materials storage areas were properly posted.

10 CFR 20.311 requires a licensee who transfers radioactive waste to a land disposal facility to prepare all waste so that the waste is classified in accordance with 10 CFR 61.55 and meets the waste characteristic requirements of 10 CFR 61.56.

The inspector determined that the licensee had made 38 radioactive waste shipments in 1977. Nineteen shipments had been made to Barnwell, South

Carolina and 19 to a vendor for super compaction. The inspector reviewed radioactive waste classification documentation for selected radioactive waste shipments made in 1987 and determined that the waste had been properly classified and met the waste characteristics requirements of 10 CFR 61.

No violations or deviations were identified.

6. Transportation (86721)

10 CFR 71.5 requires that licensees who transport licensed material outside the confines of its plant or other place of use; or who deliver licensed material to a carrier for transport, shall comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation in 49 CFR 170 through 189.

The inspector reviewed selected records of radioactive waste and radioactive material shipments performed during 1987. The shipping manifests examined were prepared consistent with 49 CFR requirements. The radiation and contamination survey results were within the limits specified for the mode of transport and shipment classification. The inspector selectively performed independent calculations using licensee's records of material radioactive nuclide composition and verified that the shipments reviewed had been properly classified.

No violations or deviations were identified.

7. Allegation Followup (99014)

Allegation (RII-87-A-0102)

A contract employee working at Surry may not have received the correct external occupational exposure record. The employee stated that during the exit whole body count, the health physics technician operating the equipment became alarmed with the levels of internal contamination being measured. The employee stated the health physics technician asked him where he had been working to have received such a large dose of internal contamination.

Discussion

The inspector reviewed the licensee's written response to this allegation to Region II, dated November 23, 1987. The licensee did not substantiate any of the concerns. The inspector reviewed the licensee's investigation package which included TLD monitoring results, whole body counts, quality control checks of whole body counting equipment, surveys, respirator issuance log, and radiation work permits. The inspector determined that the alleege's whole body count results showed a measured intake of 1.41% Maximum Permissible Organ Burden (MPOB) of cobalt-60. The licensee's action level is 5% MPOB. Licensee records showed the calculated exposure to be 11.5 MPC-Hours. 10 CFR 20.103(a)(1) states that no licensee shall

possess, use, or transfer licensed material in such a manner as to permit any individual in a restricted area to inhale a quantity of radioactive material in a period of one calendar greater than the quantity which would result from inhalation for 40 hours per week for 13 weeks a uniform concentration of radioactive material in air specified in Appendix B, Table I, Column I (520 MPC-Hours). The inspector determined that the licensee had only measured one intake of radioactive material above the 5% MPOB administrative limit in 1987 and that positive measurements of intakes of radioactive material were not routinely observed by whole body count operators. The positive measurements of the alleged's whole body count may have prompted the whole body counters comments. The inspector determined that the licensee's measurements were adequate and the results well below regulatory limits. The licensee employee who had made the alleged comments concerning the alleged's whole body count results was no longer employed by the licensee and could not be interviewed. The alleged's external exposure report showed 177 mrem exposure to deep tissue and 18 mrem to the skin. The inspector determined that the licensee had adequately accounted for the alleged's internal and external exposures. The inspector determined that the licensee's investigation of the concerns had been adequate and that the findings reported to Region II were accurate.

Finding

The allegation was not substantiated.

No violations or deviations were identified.

8. NRC Information Notices (IN) (92717)

The inspector determined that the licensee had received IN 87-31 "Blocking, Bracing, and Securing Of Radioactive Materials Packages In Transportation," and had distributed the notice to appropriate personnel for review.

The inspector determined that the licensee had received IN 87-07 "Quality Control Of Onsite Dewatering/Solidification Operations By Outside Contractors". The licensee had distributed the notice to the Health Physics and Operations Section for review of applicability. The inspector determined that the licensee's quality assurance/quality control group had also received a copy of the document but had not been requested to provide comments to the licensee's section responsible for coordinating station evaluations of IE Information Notices. Licensee representatives agreed to have the quality assurance organizations comment on the notice applicability and provide guidance for any actions to be taken to preclude any similar problems identified in the notice.