

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

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Report Nos.: 50-280/88-42 and 50-281/88-42

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: October 11-14, 1988

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

SUMMARY

Scope: This routine, unannounced inspection involved a review of the facility's radiation protection program including followup on licensee Performance Improvement Program (PIP) items and on previously identified inspector followup items (IFIs).

Results: Progress has been made toward improving the radiation protection program at Surry.

One violation was identified involving failure of personnel exiting the site to follow radiation protection procedures for use of the portal monitors.



REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *D. Benson, Station Manager
- *R. Bilyeu, Engineer, Licensing
- W. Cook, Operations Supervisor, Health Physics
- B. Dorsey, Shift Supervisor, Health Physics
- *D. Erickson, Superintendent, Health Physics
- A. Friedman, Superintendent, Nuclear Training
- *E. Grecheck, Assistant Station Manager, Nuclear Safety and Licensing
- C. Lufman, Supervisor, Security
- W. Meck, Shift Supervisor, Health Physics
- *G. Miller, Licensing Coordinator
- *H. Miller, Assistant Station Manager, Operations and Maintenance
- *J. Ogren, Superintendent, Maintenance
- L. Pettaway, Shift Supervisor, Health Physics
- *S. Sarver, Superintendent, Health Physics
- *F. Thomasson, Supervisor, Corporate Health Physics
- W. Thornton, Director, Health Physics and Chemistry, Corporate
- F. Wolking, Senior Staff Health Physicist, Corporate

Other licensee employees contacted during this inspection included craftsmen, engineers, operators, mechanics, security force members, technicians, and administrative personnel.

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*F. Cantrell, Section Chief, Reactor Projects
*W. Holland, Senior Resident Inspector
L. Nicholson, Resident Inspector

*Attended exit interview

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

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

The company Radiation Protection Plan (RPP), Chapter II, Attachment II-1, requires in item 2 that individuals obey posted, verbal and written Health Physics (HP) instructions.

HP Procedure, HP-9.0.702, Calibration and Operation of Eberline Model PMC-4B/PMP-4C (portal radiation monitor), dated August 29, 1988, requires in Attachment 1, item 2.0 that, once an alarm has sounded, HP is to be notified and the individual causing the alarm is to remain in the area until released by HP.

HP Instructions posted on the portal radiation monitors at the exits in the security control points require, in item 5, that when a contamination alarm sounds with a red lamp:

- a. Confirm contamination by using second monitor.
- b. If alarm sounds again, individual is to remain in the area.
- c. HP is to be notified.

Security General Order Number 24, Duties of Exit Control Officers, dated March 28, 1988, requires in item 5.0, that the exit control officer notify HP if an individual cannot clear the radiation portal monitor and have the person standby for HP instructions.

The inspector reviewed the circumstances and information concerning events that had been noted by members of an NRC Safety Systems Functional Inspection (SSFI) Team during the weeks of September 12-16 and 26-30, 1988. On September 14, 1988, SSFI team members observed a person leaving the site through the Security Access Control Building (SACB). As the person passed through the portal monitors located in the SACB, the alarm The person who had alarmed the monitor then went to the other sounded. portal monitor and passed through it, sounding another alarm. The person waited in the SACB for a few minutes and then exited the security turnstile and left the area. The team members observed ten other individuals who exited the area in a similar manner. Of the total of eleven individuals who exited, either through an alarming portal monitor or after alarming a monitor, only four performed a personal contamination survey with a frisker located in the area. None of the people waited for HP personnel to arrive prior to exiting the SACB and security personnel did not stop the people from leaving the area.

When HP technicians did arrive they checked the area for contamination, checked the monitors for holes in the detectors, reset the monitors, and checked the gas bottles supplying nitrogen to the detectors to ensure that there was an adequate supply. No problems were found and the remaining shift personnel, including the SSFI team members, exited the site.

During the following week, two people were observed by SSFI team members exiting the Secondary SACB through a portal monitor that had an "out of service" tag posted on it. The tag or sign was hung on a lanyard stretched across the opening of the portal monitor and the individuals were required to bend down slightly in order to pass through the monitor and under the sign. The individuals did not perform a personal contamination survey but proceeded through the security turnstile and out of the Secondary SACB. Again security personnel did not require the individuals to remain in the area. 3

Through interviews with licensee personnel, the inspector determined that they had experienced various problems with the portal monitors in the past. After a review of this incident and through discussions with the portal monitor vendor, the licensee found that the electronic power supply boards used in the model they had purchased were susceptible to temperature and humidity variations and fluctuations. The licensee had determined that the fluctuations in temperature and humidity were apparently causing Licensee representatives indicated that it had been hot spurious alarms. the day of September 14, 1988, and that the temperature was well into the nineties. They indicated that, at the end of the shift when numerous people were attempting to exit through the SACB, the door was held open to accommodate people leaving site. When this occurred, the temperature inside the air conditioned SACB rose rapidly and apparently caused spurious alarms of the portal monitors. When the HP technicians arrived, they had checked the monitor detectors for holes and the gas bottles for an adequate supply of nitrogen, both of which had been known to cause spurious alarms in the past.

Following a tour of the radiologically controlled area (RCA) and through discussions with the licensee, the inspector determined that it would be highly improbable that a contaminated person could reach the portal monitors without first detecting the contamination. It was noted that the RCA was totally surrounded by a fence or bounded by buildings and a person exiting the RCA was required to pass through a personnel contamination monitor or perform a whole body personal frisk in the presence of an HP technician.

After investigating these occurrences, the licensee initiated several corrective actions. The portal monitor vendor was contacted and new power supply boards were acquired and installed which are reportedly not as susceptible to spurious alarms. Also, previous to this incident, the exit control officer watched personnel exit the SACB from behind bullet-proof glass inside the security enclosure of the SACB. Following these events, an order was issued requiring a security guard to be on duty twenty-four hours a day in the hallway where the monitors are located. The licensee is also considering the possibility of interconnecting the portal monitors with the security exit turnstile. This would allow them to electronically lock the turnstile if the portal monitors alarm, thus prohibiting anyone from exiting until the alarm was reset.

Failure of personnel to follow radiation protection procedures when exiting through the portal monitors was identified as an apparent violation of Technical Specification 6.4.D. (50-280, 281/88-42-01).

3. Inspector Followup Items (92701, 83750)

The following inspector followup items (IFIs), consisting of licensee commitments detailed during Enforcement Conferences held April 21 and July 6, 1988, and issues associated with the resultant Performance Improvement Program (PIP), were reviewed and discussed with cognizant licensee representatives during the inspection. (Closed) IFI 50-280, 281/88-FRP-01: Institute Detailed Pre-job Briefing Controls.

In early March, three individuals, who were working on the incore flux mapping system, had pulled an irradiated incore detector and cable nearly onto the platform where they were working. Upon investigation of the incident, it was determined that the briefing given prior to the work had been conducted without the proper radiological control being discussed and without the presence of the Health Physics technician who would be covering the job.

To correct this deficiency, the licensee has instituted two types of pre-job briefing controls. For jobs involving anticipated general area dose rates from 100 to 1,000 millirem per hour (mr/hr), a detailed outline of items to be covered and discussed has been These items include: 1) a review of the dosimetry developed. required, the radiation and contamination levels in the job area, and the protective clothing requirements needed, 2) a discussion of the controls established by the radiation work permit (RWP), the potential for airborne problems/need for respiratory protection, and the assigned stay time, if necessary, 3) verification that everyone has been briefed on the details of the work to be done, and 4) discussions of the effects of operations in adjacent areas on the workers, survey instrumentation that will be used, the responsibilities of workers for high radiation area control and actions to be taken in the event of radiological problems.

Briefings for work to be conducted in areas with a general area dose rate greater than 1,000 mr/hr requires reviews and discussions as outlined above plus the completion of a detailed sign-off sheet to ensure that all aspects of the job have been covered. In addition, a stay time worksheet has been included to ensure that maximum allowable dose and stay time is not exceeded. The form also requires the signature of the HP Shift Supervisor or designee conducting the briefing prior to commencement of the job.

Through discussions with licensee representatives and review of the briefing forms, the inspector determined that the required briefings should provide adequate information for the worker to understand what the job entails, what the radiological controls will be and what to do in case a problem arises.

b. (Closed) IFI 50-280, 281/88-FRP-02: Management Review of the Event With HP Personnel.

Through interviews with licensee representatives, the inspector determined that the station manager had conducted a review of the aforementioned incident with HP personnel. The event and contributing factors were discussed and each individual's personal accountability and responsibility for radiation protection was stressed.

a.

c. (Closed) IFI 50-280, 281/88-FRP-03: Management Review of the Events with all Station Personnel.

Through interviews with licensee representatives, the inspector determined that the station manager had also conducted a review of the aforementioned incident with all other facility personnel. The event and contributing factors were discussed and each individual's personal accountability and responsibility for radiation protection was stressed.

d. (Closed) IFI 50-280, 281/88-FRP-04: Retain a Consultant to Evaluate the Radiation Protection Program.

Through interviews with licensee representatives, the inspector determined that an initial review of the radiation protection (RP) program had been completed by an HP consultant. As a result of the review, a number of corrective actions have been implemented. These included hiring a relief HP superintendent, forming a radiological engineering section on site in the HP group and separating the radioactive waste and decontamination functions from the HP operations section. Although followup reviews are ongoing, this item is considered closed.

e. (Open) IFI 50-280, 281/88-FRP-05: Complete Radiation Protection Program Implementation.

Following evaluations of the utility's radiation protection program (RPP) by outside contractors in 1983, a comprehensive RPP document was developed to implement both the corporate and the site RPP policies and requirements. This document, entitled Virginia Power Nuclear Operations Radiation Protection Plan, was officially approved in 1985, along with an implementation plan. The implementation plan established a schedule for implementing the various aspects of the RPP within approximately two years. The utility hired another contractor to develop the needed procedures and the implementation plan was continuously updated to reflect the contractor's progress. However, by early 1988, the station had not implemented all areas of This failure to implement the RPP was identified by the the RPP. licensee as one of the contributing factors for the potential and actual overexposure problems experienced in March and May, 1988. Licensee representatives indicated that the RPP would be fully implemented by December, 1988.

f. (Closed) IFI 50-280, 281/88-FRP-06: Implement and Train Personnel in Group I Procedures by September 1988.

As a means of implementing the RPP at the station, the licensee was expediting the review, revision and implementation of the HP procedures. At the time of the inspection, the licensee had completed revising an initial number of HP procedures, designated as "Group I" procedures, and had completed their implementation before the outage that had started in September. Group I procedures consisted of those dealing with respiratory protection, the radiation work permit program, contamination control, radioactive material control, instrumentation and surveys. The inspector reviewed the lesson plans used for training the HP technicians on these procedures and verified that the topics listed above were covered.

g. (Closed) IFI 50-280, 281/88-FRP-07: Additional Training Sessions with Station Personnel by July 31, 1988.

On May 27, 1988, a contractor, working on the reactor vessel flange in Unit 1 during a refueling outage, received an exposure of 2,527 millirem to the head. When added to his previous quarterly dose, the total for the quarter was 3,279 millirem, which was in excess of the NRC quarterly allowable limit of 3,000 millirem to the whole body. Following this incident, the station manager authorized additional training sessions for station employees to reemphasize every person's responsibility for keeping his own dose as low as reasonably achievable (ALARA) and not to rely solely on HP. The inspector reviewed the training given by the training department and verified that the incident, contributing factors and personal responsibilities were discussed.

h. (Open) IFI 50-280, 281/88-FRP-08: HP Supervisors Visitation to Sites of Superior RP Performance.

Due to the small number of HP supervisors the licensee had from outside the utility's organization, it was determined that it would be beneficial to have all first and second line supervisors visit other facilities which had a good record in the HP area. It was felt that this would give the supervisors exposure to new ideas and operational methods. At the time of the inspection, only one supervisor had had the opportunity to visit another facility. A trip for another supervisor was scheduled for November, 1988, with the supervisor participating as a team member on an Institute for Nuclear Power Operations (INPO) evaluation team. All other supervisors were to be given the opportunity to visit another site following the outage that was in progress. These visits were scheduled for 1989.

i. (Open) IFI 50-280, 281/88-FRP-09: Implement and Train Personnel on Group II Procedures by December 31, 1988.

The licensee had not completed revision, implementation and training of HP technicians on "Group II" procedures. This group of procedures dealt with external dosimetry, solid radioactive waste control, effluent control, radioactive environmental monitoring, surveillance and evaluations, and radiological incident investigation and analysis. Licensee representatives indicated that they were confident that the revision, reviews and training required to implement the Group II procedures would be completed by the end of December 1988 as originally scheduled. (See item f. above.)

j. (Open) IFI 50-280, 281/88-FRP-10: Establish Two Additional Radiological Engineer Positions Onsite.

Through discussions with the licensee, the inspector determined that a new group, radiological engineering, had been established within the site HP organization. This group was set up to have a staff of three radiological engineers. At the time of the inspection one radiological engineering position had been filled with a station person and two contractors had also been hired to assist until permanent replacements could be found. The licensee indicated that the functions of this group would be field engineering or assisting in the field especially in the area of dose reduction. Such areas as shielding and containment design were to be the major areas of concern. Work package review was also another function to be assigned to the group.

- k. (Closed) IFI 50-280, 281/88-FRP-11: Add an Additional Person as a Relief HP Superintendent Prior to the Unit 2 Outage.
 - The inspector interviewed the individual who had been hired as a relief HP Superintendent. The inspector also reviewed the individual's qualifications and experience which appeared to be adequate and appropriate for the position. The person had only recently arrived on site but appeared familiar with the apparent problems that had been experienced at the facility.
- 1. (Closed) IFI 50-280, 281/88-FRP-12: Add a Director of Radiological Assessment at the Corporate Office.

The inspector interviewed the individual who had been hired to fill the position of radiological assessor. The individual's experience and qualifications were reviewed, as well, and appeared to be adequate and appropriate for the position. The person was assigned from corporate to the site during the outage to provide the outside assessment function the licensee had felt was needed. Two contract assessors were also onsite to assist in finding and identifying problems during the outage. The radiological assessor reported directly to the station manager.

m. (Open) IFI 50-280, 281/88-FRP-13: Acquire a Reverse HP Loanee From INPO Prior to the Unit 2 Outage.

The licensee indicated that this had not been accomplished but that discussions were still in progress with INPO to acquire the needed person.

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(Closed) IFI 50-280, 281/88-FRP-14: Contractors - Training and Accountability.

Through discussions with licensee training representatives, the inspector determined that this training had been provided to contractor HP technicians and other contractors as well. The inspector reviewed the lesson plans used and the lists of personnel who attended the sessions. It was also noted that a system had been established to assess all contractors' performance in order to ensure that only trained and qualified people were brought in to work at the station.

 o. (Closed) IFI 50-280, 281/88-FRP-15: Radiological Assessment Function of the Unit 2 Outage.

The licensee had hired a person to function as a corporate radiological assessor and assist at both the utility's power stations to improve the radiation protection program. (See item 1. above.) The person was onsite full time during the outage to assist and find problems that needed to be corrected. The licensee had also hired two contractor assessors to provide nearly round the clock coverage of the radiological control activities during the outage. The inspector reviewed various reports generated by this group and determined that radiological problems were being identified. The corporate radiological assessor indicated that, although no major problems or trends had been identified, the assessment program appeared to be functioning as originally outlined. He also indicated that this type assessment would continue after the outage but that his time would then be split between the two stations and corporate headquarters.

p. (Open) IFI 50-280, 281/88-FRP-16: Consolidate Procedure Development to Ensure Consistency and Integration.

The licensee indicated that a centralized procedure development staff was needed to ensure consistency and proper integration of procedures at the site. The program was to be a general program for the entire nuclear operations department and would involve upgrading all procedures including maintenance, operations, and instrumentation and control. HP procedures were not to be included in this effort initially due to the recent RPP revision and implementation program that was in place. A standard for the preparation of procedures had been completed and a procedure writer's guide was being developed.

q. (Open) IFI 50-280, 281/88-FRP-17: Ensure Proper Procedural Architecture and Human Factors Implementation.

A writers group was to be established at each site to ensure proper procedural architecture of each procedure (to standardize all procedures) and to upgrade the procedures to include human factors into all procedures. The inspector determined that a writers group had been assembled at the site and work was underway on the upgrade project. Due to the current revision and implementation of the HP procedure, they were not to be included in this upgrade project initially but would be revised/standardized at a later date. However, the licensee indicated that all the procedures were to be revised by December 1991.

r. (Open) IFI 50-280, 281/88-FRP-18: Consultant Review of Station Activities Planning and Management.

The inspector reviewed the results of a review performed at the station by a management consultant team. The consultant review indicated several areas where improvement was needed and the licensee was formulating an action plan to correct the noted deficiencies. Also, the licensee indicated that, although the initial review was completed, the management review was ongoing and may yet provide still further items for improvement.

s. (Closed) IFI 50-280, 281/88-FRP-19: Unit 2 Outage: Reduce Loading and Levelize Containment Activities.

Through interviews with licensee representatives, the inspector determined that the scope of the Unit 2 outage had been reduced with more "windows" or separate activity hold points established. This caused a slowdown in accomplishment of certain activities but allowed for better coordination of the activities toward the overall outage goal. This reduced outage scope would have aided in shortening the length of the outage, however Unit 1 had a forced outage, which strained all the resources at the facility and added more work to the outage.

t. (Closed) IFI 50-280, 281/88-FRP-20: Standards Reinforcement.

Through interviews with licensee representatives, the inspector determined that two people from corporate, designated as "coaches," were onsite for one week every other week. The coaches were trained in observation techniques and had participated in past INPO evaluations. They reported directly to the station manager and were used in the field to observe standards/procedure compliance and to help upgrade the standards when required. The station manager indicated that, following these individuals' efforts to ensure that things were done properly, not as many problems had been noted.

4. Exit Interview

The inspection scope and results were summarized on October 14, 1988, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were 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. Item Number

Description and Reference

50-280, 281/88-42-01 Violation - Failure to follow approved radiological control procedures for using portal monitors (Paragraph 2).