



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

APR 17 1989

Report Nos.: 50-338/89-05 and 50-339/89-05

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: March 20-24, 1989

Inspector: C. H. Bassett

C. H. Bassett

4/12/89

Date Signed

4/13/89

Date Signed

Approved by: J. P. Potter

J. P. Potter, Chief  
Facilities Radiation Protection Section  
Emergency Preparedness and Radiological  
Protection Branch  
Division of Radiation Safety and Safeguards

#### SUMMARY

#### Scope

This routine, unannounced inspection of the licensee's radiation protection program consisted of a review in the areas of: organization and management controls; training and qualifications; external and internal exposure control; control of radioactive material and contamination, surveys, and monitoring; and the program to maintain doses as low as reasonably achievable (ALARA). The inspection also included a review of an unresolved item (URI) and inspector followup on an allegation and on Information Notices.

#### Results

Management support of the radiation protection program appears to be adequate except in the area of controlling entry into high radiation areas. Except for this problem, the licensee's radiation protection program appears to be functioning as necessary to protect the health and safety of the occupational radiation workers. During the inspection, an allegation was reviewed concerning control of contractor health physics technicians. This matter was dealt with by the licensee prior to the inspection. No weaknesses were noted in the area of regulatory compliance but a major, recurring problem, as noted above, was identified in the area of compliance with the Technical Specification requirements.

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Within the areas inspected, the following violation was identified:

- Failure of personnel to have the required radiation monitoring device or to be accompanied by a qualified health physics technician during entry into high radiation areas (Paragraph 4.b).

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

\*M. Bowling, Assistant Station Manager, Nuclear Safety and Licensing  
E. Dreyer, Supervisor, Technical Services, Health Physics  
\*R. Driscoll, Manager, Quality Assurance  
\*R. Enfinger, Assistant Station Manager, Operations and Maintenance  
R. Irwin, Supervisor, Operations, Health Physics  
T. Johnson, ALARA Coordinator, Health Physics  
\*G. Kane, Station Manager  
\*P. Kemp, Supervisor, Licensing  
M. Lane, Shift Supervisor, Health Physics  
\*J. Leberstien, Licensing Specialist, Licensing  
S. Montgomery, Senior Instructor, Power Training Services  
T. Peters, Assistant Supervisor, Dose Control and Bioassay, Health Physics  
\*A. Stafford, Superintendent, Health Physics  
\*W. Thornton, Director, Health Physics and Chemistry, Corporate  
F. Wolking, Senior Staff Health Physicist, Corporate

#### Westinghouse Employee

I. Seybold, Coordinator, Integrated Radiological Services Program

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

#### Nuclear Regulatory Commission

J. Caldwell, Senior Resident Inspector  
\*N. Economos, Reactor Inspector, Region II  
L. King, Resident Inspector

\*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

### 2. Organization and Management Controls - Occupational Exposure, Shipping, and Transportation (83750)

#### a. Organization

The licensee is required by Technical Specification (TS) 6.2 to implement the plant organization specified in TS Figures 6.2-1. The responsibilities, authority and other management controls are further outlined in Chapters 12 and 13 of the Final Safety Analysis Report

(FSAR). TS 6.2 also specifies the members of the Station Nuclear Safety and Operating Committee (SNSOC) and outlines its function and authority. Regulatory Guide 8.8 specifies certain functions and responsibilities to be assigned to the Radiation Protection Manager and radiation protection responsibilities to be assigned to line management.

The inspector reviewed the licensee's station organization, as well as the responsibilities, authority, and control given to management as they relate to the site radiation protection program. No recent changes have been made in station organization which would adversely affect the ability of the licensee to implement the critical elements of the program. There appeared to be sufficient management support to implement essential elements of the program as necessary.

b. Staffing

TS 6.2 also specifies the minimum staffing for the plant. FSAR Chapters 12 and 13 outline further details on staffing as well.

The inspector reviewed the staffing level of the station health physics (HP) sections and discussed the current level with licensee representatives. At the time of the inspection, of the 58 HP positions authorized for the site (including shift supervisors, specialists and technicians), 49 were filled. The shortages were in the specialist and technician positions. Of the 38 authorized technician positions at the station, 11 were filled with personnel who were qualified to the requirements outlined by the American National Standards Institute (ANSI) Standard ANS 3.1-(12/79 Draft) and they were being assisted by 20 junior technicians. Due to the dual unit outage in progress, the licensee also had retained the help of 89 contractor HP technicians and approximately 70 personnel who were assisting in decontamination efforts and onsite laundry facility operation.

c. Management Controls

The inspector reviewed the licensee's Radiation Problem Reports which were used to identify and document safety and radiological problems noted by HP personnel in the plant. It was noted that nearly 40 reports had been written for 1989 to date. Most of the problems outlined dealt with the failure of personnel to comply with various procedure or radiation work permit (RWP) requirements. The inspector verified that adequate corrective actions had been initiated as a result of the findings. The inspector also reviewed selected station Deviation Reports (DRs) written for 1989. Most dealt with operational problems but two detailed the entry by unauthorized individuals into high radiation areas (HRAs). These DRs are discussed further in Paragraph 4.b.

No violations or deviations were identified.

3. Training and Qualifications - Occupational Exposure, Shipping, and Transportation (83750)

a. General Employee Training (GET)

The licensee is required by 10 CFR 19.12 to provide radiation protection training to workers. Regulatory Guides 8.13, 8.27, and 8.29 outline topics that should be included in such training.

The inspector verified, through review of selected training modules for personnel allowed access to the radiation control area (RCA), that proper training had been given to those individuals prior to RCA entry. Also, through discussions with training personnel, the inspector determined that the training given covered such topics as requirements for entry into HRAs, hot particle contamination control, and proper placement and wearing of self-reading dosimeters (SRDs). The inspector also determined that a good line of communication existed between operational HP and GET training personnel. This allowed instructors to quickly address any possible poor work practices identified in the field through improvements in training.

b. Contractor Health Physics Training

The inspector reviewed the licensee's program for training contractor HP technicians prior to allowing them to perform job coverage in the RCA. The program, developed by contract HP technicians currently working in the ALARA group, is composed of six modules that cover the various aspects of the licensee's HP program, as well as certain administrative matters. The training normally is given during eighteen hours of classroom instruction by those contractor individuals designated to function in the capacity of supervisors during the contract period. The inspector reviewed the modules and verified that the course appeared to cover the essential elements of HP and included site specific training on hot particle contamination control, job coverage for certain potentially high exposure jobs, survey techniques, and dosimetry requirements. Other training was also given the contract HP technicians including GET, if necessary, and respiratory protection training and fit testing. Following training, a test was given to verify that each individual had adequate experience and was academically qualified to function as an HP technician.

Through interviews with contract HP technicians, the inspector determined that the time spent in training varied directly with how urgently the individuals were needed to help perform job coverage in the RCA. According to those contractors interviewed, the time spent in training varied from eight to eighteen hours. The contractors indicated, however, that the training was adequate and comparable to training received elsewhere.

No violations or deviations were identified.

4. External Exposure Control and Personnel Dosimetry - Occupational Exposure, Shipping and Transportation (83750)

a. Personnel Dosimetry

10 CFR 20.202 requires each licensee to supply appropriate personnel monitoring equipment to specific individuals and requires the use of such equipment.

Due to a relative increase in the number of personnel contamination events (PCEs) during the outage, the licensee had begun to require the use of paper coveralls over the regular cloth protective clothing (PCs). This was done in an effort to reduce the number of PCEs. During plant tours, the inspector observed that workers were wearing the required paper coveralls. However, it was also noted that the paper coveralls were worn over the plastic bag containing the individual's SRD which was normally worn attached to a loop on the outside of the cloth PCs. In discussions with the licensee, the inspector indicated that such a practice seemed to preclude or at least inhibit the workers from checking the SRDs frequently in order to keep their exposures as low as reasonably achievable (ALARA). The licensee indicated that they would evaluate the practice and correct it as needed.

No violations or deviations were identified.

b. Control of High Radiation Areas

10 CFR 20.203 specifies posting and control requirements for radiation areas, HRAs, airborne radioactivity areas, radioactive material areas, and radioactive material.

TS 6.12.1 requires that in lieu of the "control device" or "alarm signal" required by Paragraph 20.203(c)(2) of 10 CFR 20, each HRA in which the intensity of radiation is greater than 100 mrem/hr but less than 1,000 mrem/hr shall be barricaded and conspicuously posted as a HRA and entrance thereto shall be controlled by requiring issuance of an RWP. Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

- 1) A radiation monitoring device which continuously indicates the radiation dose rate in the area.
- 2) A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate level in these areas have been established and personnel have been made knowledgeable of them.

- 3) An individual qualified in radiation protection procedures who is equipped with a radiation dose rate monitoring device. This individual shall be responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the facility Health Physicist in the RWP.

TS 6.12.2 requires that areas having a dose rate in excess of 1,000 mrem/hr be locked to prevent unauthorized entry in addition to the requirements of TS 6.12.1.

(1) Historical Perspective

The inspector reviewed the licensee's performance in the area of control of HRAs as reflected in previous NRC Inspection Reports (IRs) and in memoranda issued by the licensee on this subject. IR No. 50-338/87-25 and 50-339/87-27 discussed an event in which a HRA was left unlocked. On August 2, 1987, at 6:00 p.m., a spot reading 10 R/hr was found on a blanked flange following resin transfer that occurred on July 30, 1987. The licensee determined that the area had been left unlocked during the period between the transfer and the discovery of the HRA. A review of exposure results of personnel who had access to the area indicated that no one received inadvertent exposure as a result of the event. The event was determined to be a licensee identified violation (LIV) for failure to maintain an HRA locked as required.

IR No. 50-338, 339/88-02 opened an Unresolved Item (URI 88-02-04) concerning 12 instances of unauthorized entries into HRAs during 1987. Each event dealt with entry by individuals into an HRA without HP coverage or the required survey meter. In January of 1988, following a review of these events, the Station Manager issued a memorandum to the head of each department requesting a plan from each department to address strict RWP compliance. It was indicated that compliance with RWPs would solve the problem with HRA entries since entry into any HRA is governed by an RWP. IR No. 50-338, 339/88-18 closed out URI 88-02-04 following a review of the plans submitted by the department managers. The report also identified the instances of entry into HRAs without a survey meter or HP coverage as 12 examples of an LIV for failure to comply with the requirements of TS 6.12.

IR No. 50-338, 339/88-27 reviewed two events involving discovery of unlocked HRA (greater than 1,000 mrem/hr) access doors. On August 21, 1988, the door to the "A" gas stripper area was found unlocked and on August 23, 1988, an HRA door in the decontamination building basement was discovered unlocked. The licensee indicated that a review had been conducted and that no one received an inadvertent exposure as a result of the unlocked

doors. The licensee was given an LIV for failure to maintain the doors to HRAs locked as required by TS 6.12.2. Following a review of these events, the Plant Manager issued a memorandum on September 2, 1988, requiring a minimum of two qualified individuals to maintain continuous communication in locked HRAs and both individuals to independently verify that the door or gate to the area was closed and locked upon exiting the area. Each HRA door/gate was to be fitted with a unique key lock and the keys controlled by HP. Engineering was to evaluate the installation of automatic door closure devices, if appropriate.

IR No. 50-338, 339/88-33 opened a URI concerning an individual who "jimmied" the door to an HRA and entered without a meter or HP coverage. This event occurred on November 26, 1988, and is discussed in the following paragraph as Incident #2.

## (2) Recent HRA Entry Incidents

Four incidents, each documented in a DR written by the licensee, have occurred since August 1988, dealing with unauthorized entry into HRAs. The three latest incidents were reviewed by a member of the HP staff and an investigative report was written detailing the events of each incident. The details of these DRs and investigative reports were reviewed by the inspector.

INCIDENT #1- On August 25, 1988, a Quality Assurance (QA) inspector escorted a work crew into the Unit 1 Auxiliary Building piping penetration area, a posted HRA. General area dose rates were from 10-20 mrem/hr. Neither he nor anyone on the crew had a survey meter and no HP coverage was provided. They entered without a meter or HP coverage because the QA inspector had observed an individual inside the HRA with a meter and assumed that the person was an HP technician who could provide the needed coverage. The person inside the barrier was not an HP technician but an advanced radiation worker providing his own work coverage. After the QA inspector and work crew were escorted out of the HRA, a read out of each of their thermoluminescent dosimeters (TLDs) indicated that no one received any dose as a result of the unauthorized HRA entry.

In discussing this incident with licensee representatives, the inspector determined that, at North Anna Power Station (NAPS), a person who has been through GET and received Advanced Radiation Worker (ARW) training can provide his own coverage for work in an HRA with dose rates less than 1,000 mrem/hr. Also, it is an established work practice that, when a crew is sent into an HRA, no HP coverage is required if the crew members are all qualified as advanced radiation workers and are Quality Maintenance Team (QMT) members. One of the crew must check out a survey meter and provide coverage for the job.

The licensee took several steps as corrective action following the event. The QA inspector and the other individuals involved were given management direction and specific training to insure this inappropriate action would not recur. A recommendation was also made to require HP technicians to wear colored hoods or arm bands to distinguish them from the other workers. (The use of arm bands by HP techs was observed by the inspector during the inspection.)

INCIDENT #2 - On November 26, 1988, an unlicensed operator needed access to the Waste Solids Area, a posted, locked HRA, to collect daily samples and shiftly readings. In order to get the job done more quickly, the individual pried the locked HRA door open with his pocket knife and entered the area. He was an ARW and, as such, was qualified to use a radiation survey meter. However, he had neither a key to unlock the door nor obtained a meter from HP and had not made arrangements for HP coverage. After entering the HRA, he worked in an area with dose rates from 5-10 mrem/hr for about five minutes when two HP technicians found him. He reportedly did not enter other areas of the Waste Solids Area with dose rates from 150-700 mrem/hr. The operator was escorted out of the area and required to turned in his SRD. The individual's SRD reading for the entry was 0 mrem and his TLD read 60 mrem for the quarter. The licensee calculated 175 mrem as the maximum exposure he would have received assuming the "worst case" (i.e., if he had been in an area with a dose rate of 700 mrem/hr for 15 minutes). No internal uptake was found following an annual whole body count on November 28, 1988.

The licensee initiated various corrective actions following this incident. A plate was attached to the door/lock interface to preclude unauthorized entry. A more secure door and lock were also ordered for the area. The operator was given a "decision day" (day off without pay to decide whether or not he would follow the rules) and assigned to give presentations during General Employee Retraining regarding the importance of adhering to TS requirements and HP procedures when entering HRAs. A memorandum from the Station Manager was sent to all station personnel emphasizing the need to adhere to HRA controls and Tech Spec requirements. The operator subsequently resigned for other, unrelated reasons.

INCIDENT #3 - On January 16, 1989, two contractor engineers went to the NAPS site to perform inspections in the piping penetration area of the Auxiliary Building. They did not report to their representative onsite but went to the RCA entrance. They contacted HP and were reportedly briefed on the requirements for entry into the area including the PC and HRA requirements. They then dressed out, entered the RCA, and went to the Unit 2 piping penetration area of the Auxiliary Building on the 244 foot elevation. They entered the HRA without a meter

or HP coverage and worked in the area for approximately one and a half hours. The engineers reportedly worked in areas with dose rates from 5-10 mrem/hr. There was one hot spot in the area reading 200 mrem/hr at contact and 70 mrem/hr at one foot. (The maximum dose rates in the penetration area are on the charging and return lines and can reach 100-150 mrem/hr at one foot during changing operations. No such operations were ongoing at the time of this incident.)

An operator, upon making his rounds, found the engineers in the area and asked one engineer where his meter was located. The engineer stated that the other person had the meter and the operator left. Later the operator came back through the area, observed that they did not have a meter, and asked them to leave and report to the HP office.

The engineers' SRDs and TLDs were read and the TLD doses were assigned as their official doses for the entry: 10 mrem for one engineer and 9 mrem for the other. Results of whole body counts of the individuals indicated no internal uptake. Also, no personal contamination was detected.

Upon further investigation of this event, it was determined that the engineers had received GET at the licensee's Surry facility. The requirements for entry into an HRA at Surry are somewhat different than those at NAPS. At Surry, anyone who has received GET is allowed to check out a survey meter and provide his own job coverage in an HRA with dose rates less than 1,000 mrem/hr. At NAPS, only those who have received the ARW training can check out a meter and provide their own coverage. Although the engineers, at one point during their briefing with HP, indicated that they were trained to use a survey meter, they did not check one out at the instrument issue window.

The engineers were restricted from all further work at either of the licensee's nuclear power facilities as a measure to correct the problem with failure to comply with established HRA entry requirements. The engineering contractor was instructed to have their other employees report to the onsite project manager when arriving on site, prior to performing any work.

INCIDENT #4 - On March 15, 1989, members of a contractor rigging crew were trying to move a snubber rigid restraint through the Unit 2 containment personnel hatch. They could not use the equipment hatch due to the refueling that was in progress. Although no fuel was being moved at the time of the event, high radiation caused by fuel movement was the reason that a HRA barrier had been established beside the personnel hatch. During efforts to move the snubber restraint, several crew members briefly backed into the HRA near the personnel hatch without a meter or HP coverage. The crew members were in the area for

approximately one minute. During this evolution, one crew member also moved the HRA barrier out of the way for a period to allow better access to the snubber restraint. He then stepped into the HRA for a few moments.

Reportedly, an HP Supervisor observed this operation and told the crew members to step out of the HRA. They did not immediately respond but finally moved as the restraint was repositioned. No overexposures, personal contaminations or injuries occurred. The crew's official quarterly dose ranged from 36 to 510 mrem as determined from reading their TLDs.

Due to this HRA entry problem and other examples of lack of adherence to good HP and ALARA practices (i.e. rising numbers of personnel contaminations, poor work control by contractor HP technicians, and workers being too focused on completion of the job without regard for safety concerns), much of the work in Units 1 and 2 was stopped for 24 hours. Each crew was given a presentation on the importance of following all radiological and safety rules and on being responsive to HP directions. Each contractor supervisor was also required to respond in writing to the Station Manager detailing what actions had been taken to ensure proper adherence to RWP and station requirements.

Following a review of these incidents, the licensee was informed that the four incidents involving failure of personnel to have a radiation monitoring device as specified or to be accompanied by a qualified HP technician during entry into HRAs were identified as four examples of an apparent violation of TS 6.12.1 (50-338, 339/89-05-01)

#### c. Radiation Work Permits

The inspector observed selected outage-related work being performed using radiation control requirements dictated by RWPs. The inspector reviewed the appropriate RWPs and determined that the HP monitoring, PC, dosimetry, and respiratory protection requirements established by the RWPs appeared to be adequate. The RWPs reviewed included:

- 89-1251 - Removal of Large Bore Snubbers from Steam Generator Cubicles in Unit 2
- 89-1252 - Removal, Replacement and Repair of Small Bore Snubber in Unit 2
- 89-1448 - Eddy Current Testing in Unit 2
- 89-1616 - Replace Valves 2-RH-5, -13, and -23 on the RHR Flat in Unit 2

No violations or deviations were identified.

5. Internal Exposure Control and Assessment - Occupational Exposure, Shipping, and Transportation (83750)

a. Engineering Controls

10 CFR 20.103(b) requires the licensee to use process or other engineering controls to the extent practical to limit concentrations of radioactive material in air to levels below those specified in 10 CFR Part 20, Appendix B, Table 1, Column 1.

During tours of the Auxiliary Building and Units 1 and 2 Containments, the inspector observed the use of process controls and engineering controls to limit airborne radioactivity in the plant. The licensee used tent enclosures and vendor supplied sealed chambers to decontaminate various tools and items of equipment and to perform maintenance on contaminated items. These tents and chambers were kept under negative pressure by means of high efficiency particulate air (HEPA) filtration systems. Some filtered ventilation also was provided by using several lengths of ducting to draw air from highly contaminated work areas in places such as the pump cubicles in the containment buildings. The air was subsequently drawn into the permanent filtered containment ventilation system through the temporary ducting.

b. Respiratory Protection

10 CFR 20.103(c) requires that, when respiratory protection equipment is used to limit the inhalation of airborne radioactive material, the licensee train, medically qualify, and fit test the individual user of such equipment.

The use of respiratory protection was observed and discussed with licensee representatives. It was noted that, on occasion, respiratory protection is issued to individuals as a precaution against facial contamination and not necessarily due to airborne radioactivity or high levels of surface contamination. This practice was not widespread, however, due in part to the efforts expended during the outage in progress to decontaminate the containments.

No violations or deviations were identified.

6. Control of Radioactive Material and Contamination, Surveys, and Monitoring - Occupational Exposure, Shipping, and Transportation (83750)

a. Plant Surveys

The licensee is required by 10 CFR 20.401 and 20.403 to maintain records of such surveys necessary to show compliance with regulatory limits. Survey methods and instrumentation are outlined in Chapter 12 of the FSAR.

During plant tours, the inspector reviewed radiation level and contamination survey results posted outside various areas and cubicles. The inspector verified these radiation levels using NRC instrumentation. The inspector also reviewed selected records of radiation and contamination surveys performed by the licensee during the inspection and discussed the survey results with licensee representatives.

b. Radiation Detection and Survey Instrumentation

The inspector reviewed the licensee's use of portable radiation detection instruments for routine radiation protection activities. During plant tours, the inspector verified that all instruments observed in use had been calibrated within the prescribed time period and also observed that the selection and use of instruments was appropriate for the radiation protection activity involved.

c. Personnel and Material Release Surveys

During tours of the facility, the inspector observed the exit of workers and the movement of material from contamination control to clean areas to determine if proper frisking was performed by the workers and if proper direct and removable contamination surveys were performed on materials. The inspector determined that personal frisking was adequate but some examples of poor material survey practices were noted. The inspector observed contractor HP technicians performing contamination surveys using cotton glove liners as the smear medium. The items checked for contamination were adequately surveyed but the technique was not appropriate. In discussing this with licensee representatives, they indicated that this was not an accepted practice and that this would be stopped. No further examples of this survey "technique" were observed following the discussion.

No violations or deviations were identified.

7. Program for Maintaining Exposures As Low As Reasonably Achievable (ALARA)  
- Occupational Exposure, Shipping, and Transportation (83750)

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

a. Goals and Objectives

The inspector discussed the ALARA program with licensee representatives. The site ALARA group develops the goals for the

station based on corporate, station management and department input. Once established and agreed upon, each department head is held responsible for achieving the goal. This is done by management objective in performance plans. Contractors are also given goals with respect to ALARA. The goals are then coupled with monetary incentives to increase the likelihood of achieving the goals.

b. ALARA Suggestion Program

ALARA suggestions are encouraged and solicited from all plant workers. To reinforce this effort, T-shirts are given to all those who submit a suggestion for consideration. As further incentive, the licensee has initiated the practice of awarding a \$150 cash prize on a quarterly basis to the individual submitting the best ALARA suggestion that is adopted for action.

c. High Exposure Jobs

The inspector reviewed the exposure data to date of various jobs with the potential for high accumulated exposure and discussed these jobs with the site ALARA coordinator. The pre-job reviews, dose estimations, pre-job briefings and subsequent job review and exposure tracking for selected work in Unit 1 and Unit 2 containments were also reviewed. All but one of the jobs reviewed were well within the exposures projected for the jobs. The one job which had exceeded the projection was the sludge lancing work being performed in Unit 2. It was expected to require a total of approximately 5 person-rem for completion instead of the original estimate of 3.8 person-rem. All the licensee reviews appeared to be adequate and the pre-job briefings were being performed as required. No excessive exposure for any job was noted and it appeared that the exposures for all jobs were being tracked on a timely basis.

No violations or deviations were identified.

8. Action on Previous Inspection Findings (92701)

(Closed) URI 50-338, 339/88-33-06: Unauthorized Entry into a Locked High Radiation Area.

The inspector reviewed the event outlined in URI 88-33-06 involving entry by an operator into an HRA. The operator "jimmied" the HRA door lock and entered the area without a survey meter or HP coverage. The incident was identified as an example of an apparent violation of TS 6.12.1 for failure of the person entering a HRA to have a radiation monitoring device or to be accompanied by a qualified HP technician. The incident is further detailed in Paragraph 4.b.

## 9. Followup on Information Notices (92717)

The inspector determined that the following Information Notices (INs) had been received by the licensee, reviewed for applicability, distributed to the appropriate personnel and that action, as appropriate, had been taken or was scheduled.

IN 88-79: Misuse of Flashing Lights for High Radiation Area Control

IN 88-101: Shipment of Contaminated Equipment Between Nuclear Power Stations

## 10. Facility Statistics

### a. Annual Personnel Dose

In 1987, the station's cumulative personnel dose was 760 person-rem per reactor as compared to the Pressurized Water Reactor (PWR) national average of 369 person-rem per reactor. In 1988, the dose goal was set at 65 person-rem per reactor due to the lack of any anticipated outages. The actual cumulative dose received in 1988 was 59 person-rem per reactor. In 1989, the site goal was set at 293 person-rem per reactor. As of March 23, 1989, 247 person-rem had been expended. A goal for the current outage had been established at 228 person-rem and, as of March 23, 1989, 226 person-rem had been used.

### b. Personnel Contamination Events (PCEs)

The licensee experienced 61 skin and 197 personnel clothing contaminations for a total of 258 PCEs in 1988, compared to 611 skin and 920 clothing contaminations for a total 1,531 PCEs for 1987. This is an obvious downward trend in personnel contaminations and reflects the efforts made by the licensee to reduce the number of PCEs. As of March 23, 1989, the licensee had experienced 48 skin and 89 clothing contaminations or a total of 137 PCEs.

### c. Area Contamination Control

At the end of 1987, the licensee maintained approximately 13,250 square feet ( $\text{ft}^2$ ) within the RCA, excluding the containment buildings, as contaminated. This represented about 13 percent (%) of the total 105,000  $\text{ft}^2$  within the RCA. At the end of 1988, approximately 9,850  $\text{ft}^2$  were being controlled as contaminated area or about 9 % of the RCA. As of March 23, 1989, the licensee was maintaining approximately 17,750  $\text{ft}^2$  as contaminated area. This figure had increased due to the outage in progress and also included temporary work areas, such as those established for the painting contractors.

No violations or deviations were identified.

## 11. Followup on Allegations (99014)

### a. Statement of Concern

Allegation No. RII-89-A-0019. It was alleged that there were serious problems with the radiation protection program and the ALARA program at NAPS. The following specific allegations were made:

- (1) A contractor HP technician was fired because the individual raised safety concerns while working at NAPS.
- (2) The licensee had seriously underestimated the exposure for a specific job involving snubber removal/replacement work in the Unit 2 containment.
- (3) The ALARA program was inadequate.
- (4) The organization and control of the HP activities was poor and there was no direction given to the technicians.
- (5) Many people are receiving an excessive amount of exposure due to the high radiation levels associated with the snubber removal/replacement work.

### b. Discussion

The inspector discussed these concerns with licensee representatives and the HP contractor representatives. The inspector reviewed the work request, the pre-job review, the exposure estimate, the RWP, the additional ALARA requirements, and all the surveys and other records generated and associated with the snubber removal/replacement work. The inspector also reviewed the adequacy of the ALARA program, the organization and control of HP technicians and the exposure records of personnel involved in the snubber work. The inspector found the following:

- (1) In discussions with the onsite contractor HP coordinator, it was determined that the contractor HP technician had been fired due to insubordination. The technician had failed to complete assignments given and would not comply with the directions of the contract HP shift supervisor. The technician had raised "safety" concerns but these were used as a means to avoid unwanted work assignments. And, although the technician had failed to come to work and had failed to call in to inform the supervisor of the situation, the reason for termination was insubordination. The onsite contractor HP coordinator had spent approximately 12 hours in conversation and counselling with the individual but the individual would not agree to conform to the rules established for contractors and would not accept the authority of the assigned supervisor. The alleger had been

advised earlier of his 10 CFR 19.20 rights to engage in protected activity.

- (2) The inspector reviewed all the documents associated with the snubber removal/replacement in the ALARA file and in the HP file. The original estimate for the job had been set at 105.6 person-rem. However, the estimate had been reduced by 12% due to a management/corporate goal to establish a challenging yet realistic goal. In reviewing the exposure data received to date, the inspector determined that, with the job approximately 75% complete, 59 of the 93 person-rem estimated for the job had been expended. Licensee representatives indicated that the remaining work would be similar to that already done and they expected to use much less than the revised exposure estimate.
- (3) The inspector reviewed the ALARA program including the required pre- and post-job reviews, the exposure estimation method, and the review and tracking performed while jobs are in progress. The program appeared adequate and all aspects and requirements pertaining to the snubber job had been or were being completed. Further explanation of the areas and items reviewed can be found in Paragraph 7.
- (4) The inspector reviewed the organization and control of the contractor HP technicians. Through discussions with the licensee, it was determined that, prior to March 16, 1989, the organization and control of the contractor HP technicians had not been completely adequate. On certain shifts, the contractor HP personnel had been left in charge to enforce the station and HP organization's standards and policies. This had resulted in inadequate control of work and in poor maintenance of other aspects of control as cleanliness in the work areas. As a result, PCEs and other problem indicators had arisen, including problems with responsiveness to HP directions. As a result, the majority of all the outage work had been stopped for a 24 hour period on March 16 and direction given to bring the radiological aspects of the work under control. The licensee's HP operations work force, which consisted of six crews with a supervisor over each crew, was placed on shifts of six days per week for 12 hours per day; three crews on day shift and three crews on night shift. A licensee HP supervisor was placed in charge of each containment on each shift and the third supervisor on shift was in charge of RWP preparation and support.

This has appeared to be effective in bringing the work under control and in allowing enforcement of the licensee's work practices and standards. This approach has allowed the licensee HP supervisors and technicians to be in a position to coach and help the contractors as the need arises.

(5) The inspector reviewed the personnel records of selected individuals and the dose records of all individuals with a total accumulated quarterly exposure greater than 1,000 mrem. It was noted that the individuals with the highest exposure for the quarter were not ones working on the snubber job. Of all those reviewed, the highest exposure received had been 1,739 mrem, which was within the regulatory limit of 3,000 mrem for quarterly exposure. The inspector also verified that the exposure extension forms had been completed as required by procedure as needed and NRC Forms 4 were on file for those individuals.

c. Finding

There were no serious problems identified with the radiation protection program or with the ALARA program except as previously outlined in this paragraph and in Paragraph 4 regarding control of HRAs.

d. Conclusion

The allegation was partially substantiated in that there had been poor control and organization of HP activities. This, however, appears to have been rectified with the assignment of licensee HP crews to each shift. The other aspects of the allegation were not substantiated.

No violations or deviations were identified.

12. Exit Interview

The inspection scope and findings were summarized on March 23, 1989, with those persons indicated in Paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection.

<u>Item Number</u>	<u>Description and Reference</u>
50-338, 3391/89-02-01	Violation - Failure of personnel to have a radiation monitoring device as specified or to be accompanied by a qualified HP technician during entry into HRAs (Paragraph 4.b).

Licensee management was informed that the item discussed in Paragraph 8 was considered closed.

## 13. Acronyms and Abbreviations

ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
ARW	Advanced Radiation Worker
CFR	Code of Federal Regulations
DR	Deviation Report
FSAR	Final Safety Analysis Report
ft <sup>2</sup>	Square feet
GET	General Employee Training
HEPA	High Efficiency Particulate Air (filter)
HP	Health Physics
HRA	High Radiation Area
IN	Information Notice
IR	Inspection Report
LIV	Licensee Identified Violation
mrem	Millirem
mrem/hr	Millirem per hour
NAPS	North Anna Power Station
PCs	Personal Protective Clothing
PCE	Personal Contamination Event
PWR	Pressurized Water Reactor
QA	Quality Assurance
QMT	Quality Maintenance Team
RCA	Radiation Control Area
RWP	Radiation Work Permit
SNSOC	Station Nuclear Safety and Operating Committee
SRD	Self-reading Dosimeter
TLD	Thermoluminescent Dosimeter
TS	Technical Specification
URI	Unresolved Item