



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report No.: 50-338/78-28

Docket No.: 50-338

License No.: NPF-4

Licensee: Virginia Electric and Power Company
P. O. Box 26666
Richmond, Virginia 23261

Facility Name: North Anna 1

Inspection at: North Anna Site

Inspection Conducted: September 11-15, 1978

Inspector: G. R. Jenkins

Reviewed by:

AF Gibson
A. F. Gibson, Chief
Radiation Support Section
Fuel Facility and Materials Safety Branch

10/24/78
Date

Inspection Summary

Inspection on September 11-15, 1978 (Report No. 50-338/78-28)

Areas Inspected: Routine, unannounced inspection of startup tests related to radiation surveys, chemistry and radiochemistry, and monitor correlation; radwaste systems; neutron monitoring; followup on unresolved items and IE Circular and Bulletins. The inspection involved about 30 inspector-hours on site by one NRC inspector.

Results: Of the five areas inspected, one item of noncompliance was identified (Deficiency: Failure to report change to radwaste system (78-28-01)).

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DETAILS I

Prepared by: G. R. Jenkins
 G. R. Jenkins, Radiation Specialist
 Radiation Support Section
 Fuel Facility and Materials Safety
 Branch

10/23/78
 Date

Dates of Inspection: September 11-15, 1978

Reviewed by: A. F. Gibson
 A. F. Gibson, Chief
 Radiation Support Section
 Fuel Facility and Materials Safety
 Branch

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1. Individuals Contacted

Virginia Electric and Power Company (VEPCO)

- W. R. Cartwright, Station Manager (by telephone)
- *C. E. Necessary, Superintendent, Station Operations
- *D. M. Hopper, Health Physics Supervisor
- R. Queener, Health Physicist
- A. Stafford, Senior Health Physics Technician
- *D. G. McLain, Engineer
- M. E. Hull, Associate Engineer
- D. C. Woods, Coordinator
- J. E. East, Associate Engineer, Licensing Group, Richmond (by telephone)
- J. Gilbert, Health Physics Technician

Chem-Nuclear Systems, Inc.

R. Royal, Radwaste Operator

2. Licensee Action on Previous Inspection Findings

(Open) Unresolved item (78-14-04): Excessive radiation levels in containment. Interim shielding, as discussed in RII Rpt. No. 50-338/78-15, was installed. Neutron and gamma radiation measurements were made by Stone and Webster Engineering Corporation, June 27-28, 1978, in annular region of containment and in personnel air lock. Licensee management agreed to submit a status report to RII by October 1, 1978, presenting tentative plans and schedule for design and installation of permanent shielding. This item remains open.

(Closed) Unresolved item (78-15-02): Access control for high radiation areas. The Health Physics Manual, Section 2.3.5, was revised to clarify "buddy system" requirements where padlocks are used to control access to locked high radiation areas. There were no further questions on this item.

3. Unresolved Items

No new unresolved items were identified during this inspection.

4. Neutron Monitoring Practices

The Health Physics Supervisor stated that the use of a neutron film badge service had been discontinued. He said the NTA film detected no neutrons, even in cases where neutron exposures during containment entries were known to have occurred. The inspector reviewed selected personnel exposure records and verified that individual neutron exposures from containment entries, based on neutron/gamma ratios and, more recently, an integrating rem-meter, were being calculated and recorded in accordance with Regulatory Guide 8.14. Licensee representatives said that about three entries to containment had been made since the completion of the shielding surveys in June. The Health Physics Supervisor said that he expects to implement an albedo-TLD program for personnel neutron dosimetry in the near future.

5. Startup Radiation Surveys

An inspector reviewed the completed Startup Test Procedure 1-SU-8, "Containment Shielding and Radiation Survey". As previously discussed in RII Rpt. No. 50-338/78-15, these surveys revealed excessive neutron levels as well as high gamma levels in the basement area. The inspector determined that the surveys were conducted in accordance with approved Procedure 1-SU-8, with appropriate revisions, and that the results, including discrepancies, were properly reviewed.

6. Startup Tests - Reactor Coolant Chemistry and Radiochemistry

An inspector reviewed the completed Startup Test Procedure 1-SU-32, "Chemical Analysis of the Reactor Coolant System", and verified that all sample results for fluoride, chloride, dissolved oxygen, and specific activity were within the applicable technical specification limits (T. S. 3.4.7 and T. S. 3.4.8). The inspector determined that the tests were conducted in accordance with approved Procedure 1-SU-32 and that all results were properly reviewed.

7. Correlation of Radiation Monitor Readings

An inspector reviewed the completed Startup Test Procedure 1-SU-43, "Effluent Monitoring Test". The stated purpose of the test was to verify the calibration of selected channels of the radiation monitoring system by laboratory analysis of samples. Although the tests were conducted in accordance with 1-SU-43, the inspector stated that the test served no useful purpose because essentially all the monitor readings and sample results were at background levels. The inspector noted that the need still exists to correlate process and effluent

monitor readings with known fluid concentrations. A licensee representative pointed out that the proposed radiological effluent technical specifications, currently under review, will require that liquid and gaseous effluent monitor calibrations include the use of a known liquid or gaseous source with beta-gamma fluences and energies in the ranges measured during normal operation. The Health Physics Supervisor stated that a monitor correlation program will be developed. The inspector stated that the status of that program will be reviewed during a later inspection (78-28-02).

8. Semiannual Radioactive Effluent Release Report

An inspector reviewed the initial semiannual "Radioactive Effluent Release Report" for the period April 5 - June 30, 1978. The report acknowledged that calculated offsite doses were not included as required, and stated that the dose calculations would be submitted as soon as possible in a supplementary report. When questioned by the inspector, the Health Physics Supervisor stated that the supplementary report would be submitted by December 1, 1978. The inspector identified two errors in Table 2A, "Liquid Effluents - Summation of All Releases":

- (a) the average diluted concentrations for fission and activation products, tritium, and gases were reported high by a factor of 1000 due to a calculational error;
- (b) the total dissolved and entrained gaseous activity released was reported low by a factor of about 70 due to an error in totaling the two contributing isotopes.

The inspector commented to license management that, although the quantities of radioactivity released during this first report period are low, these errors are symptomatic that a more rigorous review of the data is needed prior to issuing a report. The Health Physics Supervisor stated that a corrected Table 2A would be submitted with the supplemental report discussed above. The inspector identified the supplemental report, to be submitted by December 1, 1978, as an open item (78-28-03).

9. Liquid Waste Disposal System

- a. An inspector discussed the liquid radioactive waste processing system with licensee representatives to determine if the system was performing in accordance with design and as described in FSAR Section 11.2. Licensee representatives said that the installed waste evaporator was not being used routinely because it had been recognized that its rated flow rate of 6 gpm would not be adequate to process the volume of water encountered at the station. Instead, a contractor-supplied demineralization system was installed and put into operation in early July 1978. This system, located in the

- waste solidification area of the decontamination building, is processing liquid waste at a flow rate of about 20-24 gpm. It is connected with rubber hoses, with input from the high level waste tanks and output to the low level waste tanks. Replacement of the temporary rubber hoses with piping is in the design stage.
- b. The inspector held discussions with licensee representatives and reviewed documentation to determine if this change to the liquid waste system had been properly reviewed and evaluated in accordance with 10 CFR 50.59. A design change package (DC-77-2) was reviewed and approved by the Station Nuclear Safety and Operating Committee on May 18, 1978. A jumper log entry providing for the rubber hose connections to bypass the waste evaporation system was approved by the Operating Supervisor on June 30, 1978. The jumper log referred to the safety evaluation of DC-77-2, which concluded that there was no unreviewed safety question. A second, more detailed, design change (also identified as DC-77-2) was initiated on August 28, 1978. At the time of this inspection, this latter package was still under review by station engineering. During a telephone conversation on September 22, 1978, the Station Manager stated that the second design change number would be altered to differentiate it from DC-77-2 as approved by SNSOC on May 18, 1978 (78-28-04).
- c. In reviewing the licensee's safety evaluation associated with the change to the liquid waste system, the inspector noted an apparent flaw in the Nuclear Power Station Quality Assurance Manual (NPSQAM), Section 14, paragraph 5.2.3 related to the review of jumpers. This paragraph states, in part, that when it is determined that:
- (1) the jumper is to be installed in a safety-related system, and
 - (2) the system, component, or equipment is described in the FSAR,
- then the proposed installation of the jumper shall be reviewed and approved by the SNSOC prior to installation. During a telephone conversation with the Station Manager on September 22, 1978, the inspector stated that that paragraph could mislead station personnel in that, as written, both (1) and (2) are necessary conditions for SNSOC review, whereas 10 CFR 50.59 requires a safety evaluation for a change to an FSAR described system with safety implications whether or not "safety-related". The Station Manager stated that the paragraph would be reviewed to determine if the wording could be improved (78-28-04).
- d. The Initial Decision of the Atomic Safety and Licensing Board, issued December 13, 1977, stated (paragraph 132) that, if VEPCO plans to remove or to make significant changes in the normal operation of equipment that controls the amount of radioactivity in effluents from the North Anna Station, the Staff should be notified in writing regardless of whether the change affects the amount of radioactivity in the effluents. This is incorporated as

a license condition in Facility Operating License No. NPF-4, paragraph 2.D.(3)e. An associate engineer at VEPCO's General Office stated by telephone on September 19, 1978, that the change to the liquid waste system described in paragraph 9.a. above had not been reported in writing to the NRC staff. He stated that it was not considered a significant change. The inspector stated it appeared that it was a significant change, considering that all liquid waste from high level tanks is being processed by the added system. During a telephone conversation with the Station Manager on September 20, 1978, the inspector identified the failure to notify the NRC in writing of this planned change to the liquid waste system as noncompliance with Facility Operating License NPF-4 (78-28-01). The Station Manager stated by telephone on September 22, 1978, that the report was being prepared.

10. Solid Waste Disposal System

An inspector discussed the solid radioactive waste system with licensee representatives to determine if the system was performing in accordance with design and as described in FSAR Section 11.5. In discussing the planned disposal of spent resin, the Health Physics Supervisor said that resin will be dewatered and shipped off site for burial. The inspector noted that the FSAR, Section 11.5.2, states that spent resin is to be transferred in a slurry to the waste solidification system, and that it will be dewatered, mixed, and solidified within disposable containers. The Health Physics Supervisor said that solidification of resin is not planned, and stated that an FSAR change would be initiated to reflect that change. The inspector identified this as an open item for followup (78-28-05).

11. IE Circular 78-03 - Shipments of Low Specific Activity Radioactive Material

An inspector discussed IE Circular 78-03 with licensee representatives, who stated that a review of radioactive material shipment records revealed no cases where LSA shipments of greater than Type A quantities were made in non-specification containers. The inspector determined that Procedure HP 3.2.8 did not specifically address a caution against such an occurrence. This procedure was changed to include that caution. The inspector had no further questions.

12. IE Bulletin 78-07 - Protection Afforded by Air-Line Respirators and Supplied Air Hoods

An inspector discussed VEPCO's letter of August 14, 1978, in response to the subject bulletin. Neither supplied air hoods nor respirators in the demand mode are used at North Anna Station.

13. IE Bulletin 78-08 - Radiation Levels From Fuel Element Transfer Tube

An inspector discussed VEPCO's letter of August 14, 1978, in response to this bulletin, which described a 6" gap between shielding and containment wall over the fuel transfer canal in the containment building. The licensee plans to barricade and post the area prior to refueling, and perform surveys during the transfer of fuel. The inspector stated that the Health Physics technicians should be specifically briefed on the fuel transfer tube location and configuration prior to making these surveys. The Health Physics Supervisor acknowledged that this would be done. The inspector identified this as an open item to be followed up at the time of the first refueling (78-28-06).

14. Effluent Radiation Monitors

- a. An inspector discussed with licensee representatives an event which occurred at another facility involving the condenser air ejector monitor. As a result of a significant leak in a steam generator tube, the monitor spiked momentarily but then went downscale due to saturation of the G-M detector. North Anna uses the Westinghouse radiation monitoring system. A review of the technical manual determined that the G-M detectors used in gaseous monitors are designed with current mode circuitry to prevent saturation.
- b. The inspector also discussed an event at another facility where a continuous iodine stack monitor gave erroneous readings due to the detection of noble gases. North Anna does not have a continuous iodine monitor; iodine stack releases are evaluated based on samples collected on charcoal adsorbers.

15. Exit Interview

The inspector met with management representatives (denoted in paragraph 1) on September 14, 1978, and summarized the scope and findings of the inspection. In addition, the inspector contacted the Station Manager by telephone on September 20 and 22, 1978; items discussed included one item of noncompliance identified in this report.