



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARSHALL STREET, N.W.
 ATLANTA, GEORGIA 30303

Report Nos. 50-338/82-33 and 50-339/82-33

Licensee: Virginia Electric and Gas Company
 Richmond, VA 23262

Facility Name: North Anna Power Station

Docket Nos. 50-338 and 50-339

License Nos. NPF-4 and NPF-7

Inspection at the North Anna site near Mineral, Virginia

Inspectors: G. N. Huffman 9/30/82
 G. N. Huffman Date Signed

R. R. Marston 9/30/82
 R. R. Marston Date Signed

Approved by: G. R. Jenkins 9/30/82
 G. R. Jenkins, Section Chief Date Signed
 Technical Engineering Inspection Branch
 Division of Engineering and Technical Programs

SUMMARY

Inspection on September 18, 1982

Areas Inspected

This routine, announced inspection involved 124 inspector-hours on site in the area of a full-scale radiological exercise.

Results

In the area inspected, no violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *R. H. Leasburg, Vice President Nuclear Operations
- *W. L. Stewart, Manager Nuclear Operations and Maintenance
- *W. R. Cartwright, Station Manager
- *J. W. Ogren, Administrative Services Supervisor
- *A. H. Stafford, Supervisor Health Physics
- B. R. Slyvia, Manager Nuclear Operations and Maintenance
- *L. B. Jones, Supervisor Chemistry
- *F. P. Miller, Supervisor Quality Assurance Operations
- *J. W. Martin, Jr., Corporate Director of Emergency Planning
- *E. M. Topping, Corporate Emergency Planning Coordinator
- *R. W. Beckwith, Corporate Emergency Planning Coordinator
- *T. A. Carder, Emergency Planning Coordinator
- *W. W. Cameron, Corporate Director Chemistry and Health Physics
- *M. E. Fellows, Staff Assistant (Mgr.)
- R. D. Garner, Supervisor Nuclear Training
- J. B. Breeden, Nuclear Training Coordinator
- H. F. Osternsen, Quality Assurance

Other licensee employees contacted included technicians, operators, mechanics, security force members and office personnel.

Other Organizations

- J. R. Asher, FEMA
- W. Linwood, SOES
- J. Martin, U.S. DOE
- W. E. Belanger, U.S. EPA

NRC

- *D. L. Andrews
- M. B. Shymlock, RI

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on September 18, 1982, with those persons indicated in paragraph 1 above.

3. Licensee Action on Previous Enforcement Matters

(Closed) Deficiency (338/80-32-04, 339/80-30-04): Ensure correct telephone numbers on the emergency call list and relocate the Control Room Communica-

tor to minimize distractions. This item was addressed in part 4 of the Region II Confirmation of Action Letter dated August 19, 1980. An inspector reviewed and verified that corrective actions had been taken which appear to be adequate (Details, paragraph 11).

(Closed) Deficiency (338/80-32-05; 339/80-30-04): Relocate the telephones at the TSC and EOF to provide more effective distribution, and add lights to identify incoming calls. This item was addressed in part 5 of the Region II Confirmation of Action Letter dated August 19, 1980. An inspector reviewed and verified that corrective actions had been taken which appear to be adequate (Details, paragraph 11).

In addition to the above, the inspector reviewed actions taken by the licensee on selected emergency preparedness improvement items as addressed in VEPCO's letter of July 29, 1982. The status of these items is discussed in the details of this report.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Exercise Scenario

The scenario for the emergency exercise was reviewed to determine that provisions had been made to test the integrated capability and a major portion of the basic elements existing within the licensee, state and local emergency plans and organization as required by 10 CFR 50.47(b)(14), 10 CFR 50, Appendix E, paragraph IV.F and specific criteria in NUREG-0654, Section II.N.

The scenario was reviewed in advance of the scheduled exercise date and was discussed with licensee representatives on July 15, and August 6, 1982. The scenario developed for this exercise was adequate to fully exercise the onsite and offsite emergency organizations of the licensee and provided sufficient emergency information to the state and local governmental agencies for their full participation in the exercise. The inspectors had no further questions in this area.

6. Assignment of Responsibility

This area was observed to determine that primary responsibilities for emergency response by the licensee have been specifically established and that adequate staff is available to respond to an emergency as required by 10 CFR 50.47(b)(1), 10 CFR 50, Appendix E, paragraph IV.A, and specific criteria in NUREG 0654, Section II.A.

The inspectors observed that specific emergency assignments had been made for the licensee's emergency response organization and there was adequate staff available to respond to the simulated emergency. The initial response organization was augmented by designated licensee representatives and the capability for long term or continuous staffing of the emergency response

organization was demonstrated. However, the staffing time for the TSC was exceptionally long (see paragraph 7).

The TSC was declared fully operational at 0710. Personnel began to arrive to staff the EOF at about the same time. Consequently, after declaration of a Site Emergency at 0826, it was observed that at 0835 the EOF took control of the radiation monitoring teams in the field. However, the transfer of command and control authority from the Station Emergency Manager in the TSC to the Recovery Manager in the EOF was ambiguous and some people were uncertain the transfer had occurred even two hours later. This area will be reviewed during a subsequent inspection (338; 339/82-33-01).

It was observed that requests for emergency actions from the OSC were being made directly to the foreman of the various response groups, rather than the OSC Director. Although detected later by the OSC Director, and counter by an order that all activities be coordinated through him, a documentation problem resulted. The responsibilities and authorities of OSC Director should be resolved. Consequently, an inspector follow-up item is identified (338; 339/82-33-02).

7. Onsite Emergency Organization

The licensee's onsite emergency organization was observed to determine that the responsibilities for emergency response are unambiguously defined, that adequate staffing is provided to insure initial facility accident response in key functional areas at all times, and that the interfaces among various onsite response activities and offsite support activities are specified as required by 10 CFR 50.47(b)(2), 10 CFR 50, Appendix E, paragraph IV.A, and specific criteria in NUREG 0654, Section II.B.

The inspector observed that the initial and onsite emergency organization was well defined and that adequate staff was available to fill key functional positions within the emergency organization. Augmentation of the initial emergency response, through mobilization of off-site personnel and corporate assistance, was initiated at the "Alert" Emergency Action Level. Consequently, the EOF was activated within minutes of the declaration of a "Site Emergency." However, the first TSC staff did not arrive until 43 minutes after the Alert and the Site Emergency Manager did not declare the TSC fully activated until one hour and fifty minutes after the Alert. The time required to activate the TSC was discussed with the licensee and will be reviewed during a subsequent inspection (338, 339/82-33-03).

8. Emergency Response Support and Resources

This area was observed to determine that arrangements for requesting and effectively using assistance resources have been made, that arrangements to accommodate State and local staff at the licensee's near-site Emergency Operations Facility have been made, and that other organizations capable of augmenting the planned response have been identified as required by 10 CFR 50.47(b)(3), 10 CFR 50, Appendix E, paragraph IV.A and specific criteria in NUREG 0654, Section II.C.

Assistance resources utilized during this exercise included the Mineral Volunteer Fire Department, the sheriff's offices of Louisa and Spotsylvania Counties, the Virginia State Police, the State Office of Emergency and Energy Services, and the State Department of Radiological Health. The inspector observed that assistance resources were called upon and responded promptly to the assistance request as stated in the agreements between Virginia Electric and Power Company and the various State and local organizations. The inspector had no further questions in this area.

9. Emergency Classification System

This area was observed to determine that a standard emergency classification and action level scheme is in use by the nuclear facility licensee as required by 10 CFR 50.47(b)(4), 10 CFR 50, Appendix E, paragraph IV.C, and specific criteria in NUREG 0654, Section II.D.

The inspectors observed that the emergency classification system was in effect as stated in the Radiological Emergency Plan (REP) and Emergency Plan Implementing Procedures (EPIPs). The system appeared to be adequate for the classification of the simulated accident and the emergency procedures provided for the initial and continuing mitigating actions taken during the simulated emergency. However, both the operators and controllers made an apparent oversight in interpreting the Emergency Action Levels (EALs) for the scenario as written. EPIP-1.0 Tab B.11 states that loss of two of three fission product barriers with potential loss of the third barrier requires a classification of General Emergency. The conditions specified in Tab B.11.a.1 were exceeded at 0550 when a Reactor Coolant System (RCS) sample was reported to be 320/uCi/gm. The conditions specified in Tab B.11.b.2 were exceeded at 0730 when a leak started. The controllers were prepared to block the declaration of a General Emergency on the basis of a LOCA in order to force the scenario through the Site Emergency stage which was declared at 0826. However, the conditions of Tab B.11.c.2. were also exceeded at 0730 when automatic valving failed to close, as per Technical Specification 1.8, and the manual valves could not be closed. Loss of containment integrity at this point would have required declaration of a General Emergency, which was not declared until 0920, or blockage of that declaration by the controllers for the purpose of preserving the scenario. The need for operators to review EAL Tab B.11. and applicable Technical Specifications was discussed with the licensee. Consequently, an inspector follow-up item is identified (338, 339/82-33-04).

10. Notification Methods and Procedures

This area was observed to determine that procedures had been established for notification by the licensee of State and local response organizations and emergency personnel, and that the content of initial and followup message to response organizations has been established; and means to provide early notification to the populace within the plume exposure pathway have been established as required by 10 CFR 50.47(b)(5), 10 CFR 50, Appendix E, paragraph IV.D, and specific criteria in NUREG 0654, Section II.E.

The inspector observed that notification methods and procedures had been established and were used to provide information concerning the simulated emergency conditions to Federal, State and local response organizations and to alert the licensee's augmented emergency response organization. The inspectors had no further questions in this area.

11. Emergency Communications

This area was observed to determine that provisions exist for prompt communications among principal response organizations and emergency personnel as required by 10 CFR 50.47(b)(6), 10 CFR 50, Appendix E, paragraph IV.E, and specific criteria in NUREG 0654, Section II.F.

The inspectors verified that primary and alternate means for communications among the various response organizations were provided and that, in general, communications among these organizations and among emergency response personnel were good. Dial telephone lines to critical state and local emergency operations centers have been replaced by ring-down telephones and the Control Room communicator has been relocated to avoid distractions. The telephones in the EOF have been relocated to avoid distractions and lights have been placed on the phones to identify which telephones are ringing.

The telephone listings for emergency notifications were adequate, but a list of telephone numbers for each function within each emergency facility needs to be generated to facilitate communications between response personnel. Based on the above, the deficiencies related to this area from a previous exercise (338/80-32-04, 339/80-30-04, 338/80-32-05 and 339/80-30-05) are closed. However, an inspector followup item based on the need for a telephone listing is identified (338, 339/82-33-05).

There were three status boards in both the EOF and TSC; Plant Status, Emergency Status and Radiological Status. The Plant Status board apparently had insufficient preformatted space for all pertinent emergency data because some information was recorded in the white space around the sides of the board at the EOF. Also, the information recorded in this fashion frequently did not have the units or the time recorded. Some of the information from the Plant Status board was then passed on to the other two status boards. However, while the plant status board in the EOF was normally current, the Emergency and Radiological Status boards frequently lagged by 30 to 120 minutes. In the TSC, the site boundary radiation levels were never annotated on the Radiological Status board. In both the TSC and EOF, the system of displaying plant parameter data, by erasing old data to post new data, made it difficult to trend plant conditions. No attempt to analyze data trends was observed at either location, including use of the simple arrow system provided. This item was discussed with the licensee and will be reviewed in a subsequent inspection (338; 339/82-33-06).

12. Public Education and Information

This area was observed to determine that information concerning the simulated emergency was made available for dissemination to the public as required

by 10 CFR 50.47(B)(7), 10 CFR 50, Appendix E, paragraph IV.D, and specific criteria in NUREG 0654, Section II.G.

Information on the exercise was provided to the media approximately one month in advance. During the exercise, the main Emergency News Center was in the licensee's corporate offices. The Corporate News Center was established because the nearsite facility in the Mineral Fire Department is not really capable of handling the expected telephone traffic. The Richmond facility was spacious, well equipped and adequately staff. The audiovisual equipment was particularly good and the videorecording of press conferences so they could be viewed by late arrivals was very effective. A need was identified for a work area to be set up for Federal and State public information officers away from reporters (338, 339/82-33-07). In addition, it was noted that although considerable effort had been made to publicize a rumor control telephone number, some people called the corporate office and got a recording which said the office was closed. The licensee agreed to consider providing the rumor control number on the recording (338, 339/82-33-08).

The near-site News center in Mineral, Virginia is small and the telephone trunks out of the area are limited. Based on a previous inspection, lines for 25 telephones have been installed and provisions have been made for support services such as extra electrical outlets to be used by television personnel, copiers, a PA system, audio-visual equipment and security personnel. However, it was noted that during the exercise, the copy machine was not delivered as per the implementing procedure. Also, it was noted that a speaker phone is needed so that the reporters in Mineral can hear the press conferences as they are presented in Richmond, Virginia. Based on the above, the improvement item related to this area (338, 339/82-05-28) is closed. However, an inspector follow-up item for a speaker phone is identified (338, 339/82-33-09).

13. Emergency Facilities and Equipment

This area was observed to determine that adequate emergency facilities and equipment to support an emergency response are provided and maintained as required by 10 CFR 50.47(b)(8), 10 CFR 50, Appendix E, paragraph IV.E, and specific criteria in NUREG 0654, Section II.H.

The inspectors observed the activation, staffing and operation of the emergency response facilities and evaluated equipment provided for emergency use during the exercise.

- a. Control Room - The inspector observed that control room personnel acted promptly to initiate emergency response to the simulated emergency. Emergency procedures were readily available and the response was prompt and effective. The inspectors had no further questions in this area.
- b. Interim Technical Support Center (TSC) - The interim TSC was activated and staffed upon notification by the Station Emergency Manager of simulated emergency conditions leading to an Alert emergency classifi-

cation. However, the response was less than prompt as noted in paragraph 7. No problems were experienced during the delay, as the Control Room emergency personnel effectively managed the incident. Once activated, the TSC staff appeared to be knowledgeable concerning their emergency responsibilities and TSC operations proceeded smoothly with the exception of some problems related to accident assessment and exposure control discussed in paragraphs 14 and 16. The TSC also appeared to have adequate equipment for the support of assigned staff.

- c. Operations Support Center (OSC) - The OSC was staffed promptly upon activation by the Site Emergency Manager. The inspector observed that teams were formed promptly, briefed and dispatched efficiently with the exception noted in paragraph 6. However, the OSC does not contain the basic necessary protective equipment and supplies, as specified in NUREG-0654 Section H.9., to prepare response personnel to perform their functions. Consequently, an inspector follow-up item is identified (338, 339/82-33-10).
- d. Interim Emergency Operations Facility (EOF) - The interim EOF is located in the North Anna Visitors Center. This facility is not well suited to its function and will be replaced by the new training center when completed this year. The EOF, as discussed in paragraph 7, was activated quickly after declaration of a Site Emergency. The EOF staff appeared to be knowledgeable concerning their emergency responsibilities and EOF operations proceeded smoothly. The EOF appeared to have adequate equipment to support the assigned staff. However, it was noted that while each group within the EOF had strong leadership, an overall coordination between groups was lacking. For example, the State representative responsible for dose assessment was not brought into discussions concerning protective action recommendations until about two hours after activation of the EOF. The probable cause of the problems observed is that the Recovery Manager is isolated from other groups in the EOF. His work space is a small office separated strategically from the rest of the building. The problem of overall coordination of EOF activities will be reviewed in a subsequent inspection (338, 339/82-33-11).

14. Accident Assessment

This area was observed to determine that adequate methods, systems and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use as required by 10 CFR 50.74(b)(9), 10 CFR 50, Appendix E, paragraph IV.B, and specific criteria in NUREG 0654, Section II.I.

The accident assessment program includes both an engineering assessment of plant status and an assessment of radiological hazards to both onsite and offsite personnel resulting from the accident. During the exercise, the engineering accident assessment team functioned effectively in analyzing the plant status so as to make recommendations to the Site Emergency Manager concerning mitigating actions to reduce damage to plant equipment, to

prevent release of radioactive materials and to terminate the emergency condition. The radiological assessment activities were spread over several groups. A group in the TSC was charged with estimating the radiological impact based upon plant monitor readings and on-site measurements. A group in the EOF was charged with assessing the impact on the basis of off-site measurements, comparing their results with the results from the TSC and making protective action recommendations for offsite populations based on their analysis. Both groups experienced some problems which suggest the need for additional training as listed below:

1. After a reactor coolant sample was taken, it was determined that it was too hot to count in a multichannel analyzer, but direct readings revealed that it was 24 R/hour on contact. The TSC team was unable to estimate the source term from the above value, even when the controller provided them with an equation. A similar problem was observed in the EOF wherein some dose assessment personnel had difficulty in solving an algebraic equation needed for correlating field measurements to release rates.
2. The TSC team was unable to approximate the time of break-through for the safeguard charcoal filters.
3. In the EOF, a conversion factor for a LOCA was used in determining thyroid dose rather than the factor for a filtered primary gas release.

Based on the above, an inspector follow-up item is identified (338, 339/82-33-12).

The off-site monitoring teams were generally very proficient, but they made some errors which suggest they also need additional training as indicated below:

1. Although the monitoring teams were well trained in the procedures, they did not seem to understand the need to use their radiation detectors in both the open and closed window modes to determine if they were actually in the plume or only seeing the shine from a plume overhead.
2. After air samples were taken, both the particulate and silver zeolite samples were placed in the same bag and taken to a low background location where a direct reading was made with an RM-14. This would cause the estimated results to be too high by the contribution of the particulate filter.
3. The monitoring teams were never observed to check their pocket dosimeters, although they spent significant time in the plume.

Based on the above, an inspector follow-up item is identified (338, 339/82-33-13).

The in-plant sampling teams knew the procedures and were generally very proficient. But they also made errors which suggest they need more training as indicated below:

1. A post-accident sampling team failed to take exposure readings on a letdown sample before transporting it. The sample was 24 R/hour.
2. A health physicist was observed to handle air samples and smears from the letdown area with his bare hands. In a later survey, he also tapped on air sample filter to loosen it from the sample head.

Based on the above, an inspector follow-up item is identified (338, 339/82-33-14).

In post accident coolant sampling, the "A" valve is located so high that the technician was required to stand on a pipe and reach past a cable tray to turn the valve. In addition, disconnecting the sample bomb is so difficult it could result in unnecessary hand exposure. The licensee agreed to review the sampling equipment and make changes as appropriate (338, 339/82-33-15).

15. Protective Responses

This area was observed to determine that guidelines for protective actions during the emergency, consistent with Federal guidance, are developed and in place, and protective actions for emergency workers, including evacuation of nonessential personnel, are implemented promptly as required by 10 CFR 50.47(b)(10) and specific criteria in NUREG 0654, Section II.J.

No inspectors were available to monitor the personnel accountability procedure following the evacuation of the protected area. However, an inspector monitored the accountability results from reports to the TSC and determined that it took 1 hour and 26 minutes to complete the accountability drill. A later report implied that the accountability procedure only took 1 hour and 6 minutes, but this is still far in excess of the 30 minute criteria. Based on the above, an inspector follow-up item is identified (338, 339/82-33-16).

The dose assessment procedures for the North Anna site were recently revised. They now provide for very rapid dose assessment when needed and the emergency staff is well trained in the use of the procedures. However, the inspector questions the technical basis for the following portions of the procedure:

1. The use of the graphs in EPIP 4.08 which display krypton-85 equivalent concentrations rather than xenon-133 equivalent concentrations.
2. The validity of the equations in EPIP 4.13(5.c) and EPIP 4.11 (7.c.1) which appear to calculate the adult thyroid dose rather than the child thyroid dose.

3. That portion of EPIP-4.07 which suggests sheltering up to 2 Rem wholebody while the EPA Protection Action Guidelines recommend evacuation at 1 Rem wholebody unless constraints make it impractical.

The above concerns were discussed with the licensee and based on their agreement to review the procedure, an inspector follow-up item is identified (338, 339/82-33-17).

16. Radiological Exposure Control

This area was observed to determine that means for controlling radiological exposures are established and implemented for emergency workers and that they include exposure guidelines consistent with the EPA recommendation as required by 10 CFR 50.47(b)(11) and specific criteria in NUREG 0654, Section II.K.

The inspectors observed that exposure control measures were in place and were utilized during the exercise. The inspectors noted that the emergency team members were knowledgeable of the dose limitations and with the exception noted in paragraph 14, appeared to be thoroughly familiar with the procedures. However, it was noted that onsite radiation survey results, area monitoring data and process monitoring data were not graphically displayed for the purpose of appraising the TSC management of the radiological conditions in the plant. Consequently, a man was allowed to work in a 1.5R/hour field near the Central Alarm Station blockhouse for an extended period of time. When the TSC realized the situation, they simulated his removal. The inspector estimates the man's simulated dose at between 2.5 and 3 Rem. This item will be reviewed in a subsequent inspection (338, 339/82-33-18).

17. Exercise Critique

The licensee's critique of the emergency exercise was observed to determine that deficiencies identified as a result of the exercise and weaknesses noted in the licensee's emergency response organization were formally presented to licensee management for corrective actions as required by 10 CFR 50.47(b)(14), 10 CFR 50, Appendix E, paragraph IV.F and specific criteria in NUREG 0654, Section II.N.

The licensee critique was held September 18, 1982 at the North Anna Power Station after the exercise. Many, but not all, of the problems noted in this report were identified by the Vepco observer's for the exercise. Licensee actions on items identified at the Vepco critique will be reviewed during a subsequent inspection.

18. Federal Evaluation Team Report

The report of deficiencies noted by the Federal Evaluation Team (Regional Assistance Committee and Federal Emergency Management Agency Region III staff) concerning the activities of offsite agencies during the exercise will be forwarded by separate correspondence.