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

Report Nos. 50-338/79-7, 50-339/79-9

Licensee: Virginia Electric and Power Company
P. O. Box 26000
Richmond, Virginia 23216

Facility Name: North Anna Units 1 and 2

Docket Nos. 50-338, 50-339

License Nos. NPF-4, CPPR-78

Inspection at North Anna Site near Mineral, Virginia

Inspectors: J. E. Gilles for — 5/9/79 Date Signed

E. J. Ford — 5/9/79 Date Signed

B. T. Moon — 5/9/79 Date Signed

Approved by: P. J. Niebuhr, Section Chief, RONS Branch — 5/9/79 Date Signed

SUMMARY

Inspection on February 5-9, 1979

Areas Inspected

This routine unannounced inspection involved 83 inspector-hours on site in the areas of plant procedures for Units 1 and 2.

Results

Of the areas inspected, no items of noncompliance or deviations were identified.

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DETAILS

1. Persons Contacted

Licensee Employees

*W. R. Cartwright, Plant Manager
*C. E. Arritt, Staff Assistant
*W. F. Diehl, Supervisor, QC
*E. W. Harrell, Superintendent Maintenance
*S. L. Harvey, Supervisor Operations
*D. Hoppe:, Supervisor Health Physics
*W. R. Madison, NRC Coordinator-VEPCO
*J. W. Ogren, Supervisor Administrative Services
*E. R. Smith, Jr., Superintendent Technical Services
*D. L. Woods, NRC Coordinator VEPCO

Other licensee employees contacted during this inspection included 5 office personnel.

NRC Resident Inspector

M. S. Kidd

*Attended exit interview.

2. Exit Interview

The inspection scope and findings were summarized on February 9, 1979 with those persons indicated in Paragraph 1 above. During the inspection, seven items were identified which require further action by licensee management for acceptable resolution. These items are contained in paragraphs 5(a), (b), (c), 6, 7, 8. The licensee acknowledged the inspectors comments on these items.

3. Iicensee Action on Previous Inspection Findings

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Plant Procedure Verification for Unit 1

The inspector conducted a review of procedures and documentation as follows:

Operating Procedures

-1-OP-1.1- (07/31/78)	Unit Startup from Cold Shutdown Condition (Mode 5) < 140°F with the Primary System Drained to Cold Shutdown conditions (Mode 5) ≤ 200°F.
-1-OP-3.2- (10/16/78)	Unit Shutdown from Hot Standby Conditions (Mode 3) to Hot Shutdown Condition (Mode 4) at <350°F.
-1-OP-21.1-	Fuel Pit Cooling and Refueling Purification. (10/30/78)
-1-OP-21.1	Containment Ventilation (10/30/78)
-1-OP-3.6- (10/24/78)	Unit Shutdown from Cold Shutdown Conditions (Mode 5) < 200°F to Cold Shutdown (Mode 5) ≤ 200°F with no Steam Bubble in Pressurizer.
-1-OP-21.3- (12/13/77)	Auxiliary Building Heating and Ventilation.
-1-OP-26.5- (5/20/77)	120V Vital Bus Distribution.
-1-OP-58.1- (2/2/78)	Motor Generator Set Operation
-1-OP-58.4- (4/28/78)	Testing Reactor Trip Breakers.
-1-OP-1.5- (08/30/78)	Unit Startup from Hot Standby (Mode 3) to Startup Conditions (Mode 2) with Reactor Critical ≤ 5% Power.

Abnormal (Alarm) Procedures

-1-AP-27- (9/6/77)	Loss of Spent Fuel Cooling System.
-1-AP-35- (2/24/77)	Loss of Containment Air Recirculation Cooling.

-1-AP-10.1- (10/17/77) Loss of 34.5 KV Bus 3.

-1-AP-10.11- (3/10/77) Loss of 480V 1A1 and 1A2 Busses.

-1-AP-31- (8/9/77) Failure of Pressurizer Pressure Control.

-1-AP-5.14- (12/13/77) Ventilation Vent Gas & Particulate Monitors VG-104 VG-103, VG-113 and VG-112.

-1-AP-1.4- (9/6/77) Dropped Rod

Emergency Procedures:

-EP-2- (5/24/78) Loss of Reactor Coolant Accident

-EP-5 (8/1/77) Loss of Reactor Coolant Flow

-EP-6- (11/29/77) Station Blackout

-EP/P-5- (8/31/77) Steam Generator Tube Rupture

-EP-1- (5/19/78) Reactor Trip

Maintenance Procedures:

-EMP-C-HS-1- (11/29/77) Pressurizer Heaters

-EMP-P-RT-1- (8/18/76) Protective Relay Maintenance for Breaker 15H1-Emergency Tie Between Bus 1H and Bus 1J-Cat 1.

-EMP-P-RT-37- (9/7/76) Protective Relay Maintenance for Station Service Bus "LC" Under - Frequency (RAS) Input.

-EMP-P-RT-41- (9/7/76) Protective Relay Maintenance for Rod Drive Motor Gener[illegible]t No. 2.

-MMP-C-FC-1- (9/3/77) Spent [illegible] Pit Cooling Pump Inspection and/or Repair

-MMP-C-GV-2- (9/30/77) Relief Valves in General

-MMP-P-CC-1- (10/12/77) Component Cooling Water Pumps

-MMP-P-EG-1- (7/31/78) Emergency Diesel Generator Engines

Administrative Procedures:

-5.0- (9/18/78) Containment Ingress and Egress

-13.0- (5/10/77) Review of Procedures

-17.0- (1/13/77) Dating of Procedures

-26.2- (4/1/77) Personnel Check-in and Check-out

Temporary Procedures:

-TEP-1- Insulation Resistance Measurement - Electric Equipment.

-TEP-2- Control Circuit Checkout

-TEP-3- Medium and Low Voltage Gear

-TEP-4- Motor Operated Valves

-TEP-5- Molded Case CB and Motor Low Voltage Relay

-TEP-6- AC Electric Motors

-TEP-7- DC Electric Motors

-TEP-9- 480V Motor Control Center

-TEP-10- Annunciator and Sequence Event System.

Technical Specification Changes:

-Change 1 - 4-20-78
-Change 2 - 4-1-78
-Change 3 - 6-28-78
-Change 4 - 8-2-78

Station Nuclear Safety and Operating Committee (SNSOC) Meeting Minutes:

- January - April, 1978
- May - July, 1978
- August - September, 1978
- October - December, 1978

The above procedures were reviewed to verify that:

- Reviews, approvals and changes covering the activities were in accordance with Technical Specifications.

- Temporary procedures were not in conflict with Technical Specifications.

- Where required procedures changes were made to reflect changes required by selected Technical Specification revisions.

- SNSOC meeting minutes reflected that Safety reviews were made and recorded in conformance with 10 CFR 50.59(a) and (b).

- Procedure contents were in accordance with Technical Specification and applicable standards.

- Selected procedure contents were adequate to control required safety related operations.

- Controls were established to prevent the freezing of functional fluid systems during maintenance.

The inspector used one or more of the following acceptance criteria for evaluating the above items in the procedure review:

- Regulatory Guide 1.33
- ANSI N18.7 (1972)
- ANSI N45.2.9(1) (1971)
- NS-Quality Assurance Manual, Sections 2 and 5.
- VEPCO-Quality Assurance Manual, Sections II and V
- FSAR-Section 17.1.3.5
- Technical Specifications, Section 6.8 - Procedures
- NAS Administrative Procedures (2.0) (13.0) and (17.0)

Within the areas inspected no items of noncompliance or deviations were identified. The following items remain open pending agreed upon corrective action by the licensee and verification by NRC at subsequent inspections:

(a) A 1978 change to the Technical Specifications requires that all three reactor coolant pumps be operating when going from Mode 3 to Mode 2. This requirement has not been addressed by the licensee in all appropriate procedures (i.e., Procedure 1-OP-1.5). This is item (79-07-02).

(b) Maintenance procedures or other referenced documents do not address the required action that would insure that portions of fluid systems that are required to be operational are protected from freezing temperatures during maintenance. This is particularly applicable to lines protected by heat tracing or other protective measures which may be interrupted during maintenance. This is item (79-07-03).

(c) Certain of the electrical maintenance procedures reviewed required the use of a meg-ohm tester for measuring the insulation resistance of the circuitry, i.e. EMP-P-RT-41- "Protective Relay Maintenance for Rod Drive Motor Generator Set No. 2 This equipment was not listed in the list of calibrated equipment used for the test. This is item (79-07-04).

6. Plant Maintenance Procedures for Unit 2

The inspector reviewed Unit 1 maintenance procedures, which had been designated for use in Unit 2, and which were contained in the Unit 2 Index of procedures. These procedures were reviewed to verify:

- That adminstrative controls had been established for review, approval and periodic updating.

- That responsibilities had been assigned in writing to assure that the procedures would be reviewed, updated and approved as required.

- Controls had been established to insure desired format and content, issuance of new and revised procedures, control and disposal of outdated procedures, temporary changes to procedures, procedures would be approved by the original approving organization and that the training organizations would be appraised of procedure changes.

The same acceptance criteria was used for Unit 2 procedure review as was used for Unit 1 review.

Within the areas inspected no items of noncompliance or deviations were identified. The following item remains open pending agreed upon corrective action by the licensee and verification by NRC at a subsequent inspection:

No mechanical maintenance procedures have been identified for Unit 2 as determined by discussions with the licensee and a review of the Unit 2 Index of Procedures and Unit 2 file of procedures. This is item (79-09-01).

7. Plant Procedures Verification

The inspector conducted a review of the following plant procedures:

Operating Procedures

-2-OP-14.0	Residual Heat Removal System
-2-OP-8.5	Operation of Excess Letdown
8.6	Volume Control Tank Operation
-2-OP-1.3	Unit Startup from Cold Shutdown Condition (Mode 5) to Hot Shutdown Condition (Mode 4) $\leq$ 350°F.
-2-OP-2.0	Unit Power Operation
-2-OP-1B	Containment Checklist
-2-OP-1.2	Unit Startup from Cold shutdown Condition (Mode 5) $\leq$ 200°F with a Steam Bubble in the Pressurizer to Cold Shutdown Condition (Mode 5) $\leq$ 200°F.

Administrative Procedures

-ADM 2.0	Station Nuclear Safety and Operating Committee
-ADM 9.0	Emergency Plan - Administrative Control
-ADM 13.0	Review of Procedures
-ADM 14.0	Return to Power following a trip
-ADM 17.0	Dating of Procedures
-ADM 30.0	Instrumentation and Controls
-ADM 34.0	Administrative Controls for Fuel Handling
-ADM 37.0	Control of Work and Special Processes
-ADM 102.0	Qualifications of Pre-Operational Testing Personnel

The above procedures were reviewed to verify that the following were in accordance with acceptance criteria:

- Reviews, approvals, and periodic updating;
- Proper format;
- Inclusion of precautions, limitations, and referencing of Technical Specifications.

Administrative Controls were reviewed for:

- the issurance, contents, review and updating of Standing Orders;
- the preparation and content of operating logs;
- proper shift turnover activities;
- a method for controlling temporary changes to procedures;
- that training received changes to procedures;
- a documented method for control of procedure.

The inspector used one or more of the following acceptance criteria for evaluating the above items used in the procedure review.

- Regulatory Guide 1.33
- ANSI N18.7 (1972)
- ANSI N45.2 (1971)
- VEPCO Nuclear Power Station Quality Assurance Manual
- Technical Specifications Section 6.8

During the inspection a licensee identified item in the area of document control was noted. The licensee is taking corrective action by issuing administrative control procedures for these documents. This is designated as an item (79-07-01) and will be reinspected on a subsequent inspection.

The inspector discussed format discrepancies in the Health Physics procedures with licensee representatives. This item was identified during a Quality Assurance inspection by the licensee and will be corrected. The inspector had no further questions at this time.

8. Emergency and Annunciator Procedures

a. Emergency Procedures

The inspector reviewed all of the emergency procedures written for Unit 2. Contents of the documents were compared to Section 5.3.8.1 of ANSI 18.7-1972, American National Standard for Administrative Controls for Nuclear Power Plants," Sections 6.8.1-6.8.3 of the proposed Technical Specifications and to those analyzed in FSAR Section 15.

The procedures reviewed were:

2-EP-1 "Reactor Trip" (Effective Date 01-8-79)

2-EP-2 "Loss of Reactor Coolant Accident" (Effective Date 12/18/78)

2-EP-3 "Main Steam System Rupture" (Effective Date 12-12-78)

2-EP-4 "Steam Generator Tube Rupture" (Effective Date 12-12-78)

2-EP-5 "Loss of Reactor Coolant Flow" (Effective Date 10-24-78)

2-EP-6 "Station Blackout" (Effective Date 12-04-78)

2-EP-7 "Fuel Failure During Handling" (Effective Date 10-16-78)

The inspector's findings are itemized as follows:

(1) The inspector found that the LOCA Procedure regarding use of the "Safety Injection Reset" feature was reviewed for Unit 1 by M. S. Kidd of this office and closed out per Region II Report No. 50-338/78-25. The inspector conducted no further review of this particular item.

(2) The inspector found that contrary to the requirement listed in Section 5.3.8.1.(4).(a) of ANSI 18.7-1972, Procedure 2-EP-1, "Reactor Trip" does not include an appropriate operator action to verify the automatic actions which take place. The automatic action to be verified is the opening of reactor trip breakers (see Section 2.1).

The licensee stated they have other means to conclude that the reactor is in shutdown condition by observing indications of "rods on the bottom."

The inspector stated that the procedure failed to follow the intent of the ANSI requirement, which states in part, "...confirmation of automatic actions that are required to stop the degradation of conditions and mitigate their consequences...."

Since the opening of the reactor trip breaker is the only reactor trip action listed in the Automatic Actions section, it is important that this action be verified. Although other means of verification may be deemed sufficient, it is a departure from the intent because a malfunction may occur as stated in the standard, "Since variations from the expected cause may occur, . . .".

(3) The inspector found another example of not verifying automatic actions which resulted in an incomplete procedural step. Section 2.2 of 2-EP-3 "Main Steam Line Rupture" lists four probable causes of automatic "Safety Injection" initiation actions, from which a definite clue can be derived to determine the nature of the emergency and to isolate the steam generator affected by steam line rupture.

No appropriate procedural steps are provided to either verify the automatic actions listed or to isolate the steam generator affected until step 4.8 of the procedure which deals with break location identification inside or outside of containment on a given steam line.

(4) The inspector found the emergency boration method used for a control rod or rods not fully inserted in procedures, 2-EP-1 (Section 3.4), 2-EP-4 (Section 3.4.3), and 2-EP-5 (Section 3.3) respectively, is not technically sound to satisfy the Section 5.3.8.1.(4) (b) of the ANSI standard. The procedures utilizes the 7 minute boration method and the inspector's comment is that this should be fortified by quantitative boration information such as "XXX PPM".

The inspector's recommendation is based on the following:

(a) When the emergency procedures have no references made to more information, the procedural step should be complete by itself.

(b) Boration rate is accomplished not by timing but by the number of pumps running at the time. The amount of boration accomplished is determined by time and boration rate.

(c) The quantitative information as such will work in all conditions and also can be used to verify the results, thereby assuring the reactor is in a "safe condition".

(d) It is industry practice.

(5) The inspector found that the emergency notification procedure employed in all of the EP's does not concur with the requirement of Section 5.3.8.1.(4).(c) of ANSI 18.7-1972. The standard requires "Notification to Plant Personnel of the nature of the Emergency." On the contrary, the notification is only made to the shift supervisor.

The licensee replied that they have emergency plans to cope with true emergencies. The inspector found that only two emergency procedures out of seven, namely 2-EP-2, "LOCA" and 2-EP-4, "Steam Generator Tube Rupture," made references to EPIP-1 for the shift supervisor to implement the emergency plan.

The adequacy of emergency plans to provide for the notification requirement of the emergency procedures will be reviewed on a subsequent inspection.

(6) The inspector found that procedure 2-EP-4, "Steam Generator Tube Rupture," does not identify the affected steam generator before the extensive use of steam dump/relief valves.

This is contrary to Section 5.3.8.(4).(d) of ANSI 18.7-1972, which states in part that, "Operator's determination that the reactor coolant system pressure boundary is intact." The missing procedure also is a deviation from section 15 of North Anna FSAR, where the intention of identifying affected steam generator in the earliest time is employed in order to minimize radioactivity release.

(7) The inspector found that certain use of S/G blowdown/reactor rampdown warrants excessive cooldown rates which might cause a safety implication. In particular, Procedure 2-EP-4 "Steam Generator Tube Rupture" employes steam blowdown by steam dump/relief valves in Step 4.12 and also suggests a unit rampdown in "greater than 5%/min." in Step 3.1.

The inspector questioned the licensee on the unlimited rampdown rate, as suggested above which may aggravate the steam generator tube leak resulting in the propagation of cracks due to the excessive thermal shocks.

b. Annunciator Procedures

The inspector reviewed annunciator Procedures for Panel 2A, through 2H, 2J and 2K respectively in terms of its format and availability of written procedures.

The inspector found that procedures 2-AR-2 and 2-AR-4, "Panel 2A and 2D- Main Control Board," does not have the following procedures which are indicated in the Annunciator Window Arrangement Drawing No. 12050-ESK-10B and 12050-ESK-10D, respectively.

2B-1, "S/G SUPPORT TEMP-1 OUT OF LIMITS"
2B-2, "S/G SUPPORT TEMP-2 OUT OF LIMITS"
2B-21, "S/G SUP HTR BKR AUTO TRIP"
2B-35, "BAT 1C HI TEM CH I-II"
2B-36, "BAT 1B HI TEMP CHI-II"
2D-47, "BATTERY RM EXHAUST FAN NO FLOW"

In addition, the procedure numbers, 2D-56 and 2D-64, are interchanged indicating a possible typographical error, in that:

2D-64, "Rx TRIP TRN A BYPASS BKR CLOSED"
2D-56, "Rx TRIP TRN B BYPASS BKR CLOSED"

The inspector found that procedures for annunciator Panel 2C, 2E, 2F, 2G, 2H, 2J, and 2K respectively were not available for review.

The program was evaluated for conformance to the following acceptance criteria:

(1) Section 5.3.8.1 of ANSI 18.7-1972
(2) Section 6.8.1-6.8.3 of the Proposed Technical Specifications.
(3) Section 15 of the FSAR.

The above procedure deficiencies are unresolved and will be carried as items 79-09-02 (Emergency Procedures in 8.a above) and 79-09-03 (annunciator procedures in 8.b above) pending corrective actions by the licensee and verification by NRC inspector.