



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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October 29, 2001

Virginia Electric and Power Company
ATTN: Mr. David A. Christian
Sr. Vice President and
Chief Nuclear Officer
Innsbrook Technical Center - 2SW
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

**SUBJECT: NORTH ANNA POWER STATION - NRC INTEGRATED INSPECTION
REPORT NOS. 50-338/01-03, 50-339/01-03 AND INDEPENDENT SPENT FUEL
STORAGE INSTALLATION INSPECTION REPORT NO. 72-016/01-01**

Dear Mr. Christian:

On September 29, 2001, the NRC completed an inspection at your North Anna Power Station, Units 1 and 2 and the North Anna Independent Spent Fuel Storage Installation. The enclosed report documents the inspection findings which were discussed on October 15, 2001, with Mr. D. Heacock and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selective procedures and records, observed activities, and interviewed personnel.

Based upon the results of this inspection, the inspectors identified a No Color finding of very low safety significance.

Since September 11, 2001, your staff has assumed a heightened level of security based on a series of threat advisories issued by the NRC. Although the NRC is not aware of any specific threat against nuclear facilities, the heightened level of security was recommended for all nuclear power plants and is being maintained due to the uncertainty about the possibility of additional terrorist attacks. The steps recommended by the NRC include increased patrols, augmented security forces and capabilities, additional security posts, heightened coordination with local law enforcement and military authorities, and limited access of personnel and vehicles to the site.

The NRC continues to interact with the Intelligence Community and to communicate information to you and your staff. In addition, the NRC has monitored maintenance and other activities which could relate to the site's security posture.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document

Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Kerry D. Landis, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-338, 50-339, 72-016
License Nos.: NPF-4, NPF-7, SNM-2507

Enclosures: NRC Integrated Inspection Reports
Nos. 50-338/01-03, 50-339/01-03, 72-016/01-01

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-338, 50-339, 72-016
License Nos.: NPF-4, NPF-7, SNM-2507

Report Nos.: 50-338/01-03, 50-339/01-03, 72-016/01-01

Licensee: Virginia Electric and Power Company (VEPCO)

Facilities: North Anna Power Station, Units 1 & 2
Independent Spent Fuel Storage Installation

Location: 1022 Haley Drive
Mineral, Virginia 23117

Dates: July 1, 2001 through September 29, 2001

Inspectors: M. Morgan, Senior Resident Inspector
J. Canady, Resident Inspector
R. Chou, Reactor Inspector, RII (Section 1R02, 4OA2, 4OA5.1
and 4OA5.2)
B. Crowley, Senior Reactor Inspector, RII (Section 1R08)
S. Vias, Senior Reactor Inspector, RII (Section 1R12.2)

Approved by: K. Landis, Chief, Reactor Projects Branch 5
Division of Reactor Projects

Attachment: Supplemental Information

Enclosure

SUMMARY OF FINDINGS

IR 05000338-01-03, IR 05000339-01-03, IR 07200016-01-01 on 07/01-09/29/2001, Virginia Electric and Power Co., North Anna Power Station Units 1 & 2 and Independent Spent Fuel Storage Installation. Resident Integrated Inspection Report, Evaluation of Changes, Tests, or Experiments.

The inspection was conducted by the resident inspectors, two region-based senior reactor inspectors and reactor inspector. This inspection identified one No Color finding. The significance of most findings is indicated by its color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by No Color or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.

A. Inspector Identified Finding

No Color. During the licensee's resolution of a previous violation associated with undersized welds, the licensee incorrectly applied Electric Power Research Institute guidelines to disposition undersized welds. As a result a proper engineering evaluation was not performed on two pipe supports in the Unit 2 Auxiliary Feedwater System.

The finding is of very low safety significance because a subsequent engineering evaluation showed the supports would perform their function.

Report Details

Summary of Plant Status

Unit 1 began the inspection period at or near 100% power in a coast down configuration for a scheduled refueling outage (RFO). On September 9, the unit was shutdown for the scheduled RFO. The inspection period ended with Unit 1 outage activities in progress.

Unit 2 operated at or near full power during the entire reporting period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R02 Evaluations of Changes, Tests, or Experiments

a. Inspection Scope

The inspectors reviewed selected samples of safety evaluations (SEs) to verify that the licensee had appropriately considered the conditions under which changes to the facility or procedures may be made, and tests conducted, without prior NRC approval. The inspectors reviewed 12 safety evaluations for changes to designs and procedures. There were no tests or experiments performed or selected. The inspectors verified, through review of additional information, such as calculations, drawings, procedures, or other supporting documents, that the licensee had appropriately concluded that the changes could be accomplished without obtaining a license amendment. The 12 safety evaluations reviewed are listed in the Attachment to this report.

The inspectors also reviewed samples of design/engineering transmittals and procedure changes for which the licensee had determined that evaluations were not required to verify whether the licensee's conclusions to "screen out" these changes were correct and consistent with 10 CFR 50.59. The 11 reviewed changes are listed in the Attachment to this report.

b. Findings

No Color. The inspectors identified that during the licensee's resolution of a previous violation associated with undersized welds, the licensee incorrectly applied Electric Power Research Institute (EPRI) guidelines to disposition two supports with undersized welds. As a result, the licensee did not adequately perform and document an engineering evaluation for these two supports with undersized welds in the Auxiliary Feedwater System (AFW).

During the review of Engineering Transmittal ET-CE-99-001, As-built Support Details, the inspectors identified that the licensee incorrectly applied EPRI guidelines to 1/8 inch undersized welds measured in the field for two Unit 2 AFW pipe supports, 2-WAPD-R-20A and 2-WAPD-R-20B. As a result, the licensee did not perform an engineering evaluation to determine if the welds were acceptable for the support member stresses.

The pipe supports were selected by the licensee for reinspection as part of the corrective action in response to a violation documented in NRC Inspection Report Nos. 50-338, 339/98-05. The licensee selected 58 pipe supports for field reinspection in order to evaluate the extent of undersized welds in general. These two supports were found in the field to have 1/8 inch undersized welds for a portion of their length and were dispositioned as acceptable because the licensee incorrectly concluded they were within the EPRI guidelines, as stated on page 2 of Attachment 1 in ET-CE-99-001. However, EPRI Report NP-5380, "Visual Weld Acceptance Criteria," Section 2.5.2.2 states that a fillet weld shall be permitted to be less than the size specified by 1/16 inch. In this case, the 1/8 inch undersized welds were outside the EPRI acceptance guidelines and an engineering evaluation should have been performed and documented. The licensee subsequently performed an engineering evaluation for the 1/8 inch undersized welds for these two supports and concluded that the undersized welds were acceptable for the support member stresses.

The improper disposition of undersized welds had a credible impact on safety because incorrect acceptance criteria for evaluating undersized welds was applied and could have resulted in supports with inadequate welds remaining unevaluated and in-service. The finding is of very low safety significance because the subsequent evaluation showed the supports were capable of performing their function. This problem resolution finding is also in Section 4OA2 of this report.

1R04 Equipment Alignment

a. Inspection Scope

The inspectors performed partial and complete walk downs of systems, structures, and components (SSC) to determine if they were correctly aligned in accordance with appropriate procedures and drawings. The partial walk downs were performed on a redundant train/system while the other was out of service. The complete walk down was performed on a risk-important mitigating system. The following SSCs were assessed for their correct alignment:

- Partial - Unit 1A Instrument Air Compressor Alignment, (1-OP-46.1A, "Valve Checkoff - Instrument Air, Auxiliary Building," Revision 20)
- Partial - Unit 1 and Unit 2 "A" Service Water to Charging Pump Header Alignments, (0-OP-49.1A, "Valve Checkoff - Service Water," Revision 33-P2)
- Complete - Unit 1 H EDG Support System Alignments, (1-OP-6.7A, "Valve Checkoff - Diesel Air," Revision 2; and 1-OP-6.1A, "Valve Checkoff - 1H Diesel Engine Cooling Water," Revision 7).

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors assessed the implementation of the fire protection program using “NAPS Appendix R Report,” Revision 18, and Virginia Power Administrative Procedure (VPAP)-2401, “Fire Protection Program,” Revision 17. The inspectors checked the control of transient combustibles and the material condition of the fire detection and fire suppression systems in the following areas:

- Unit 1 and Unit 2 Air Conditioning Chiller Rooms
- Unit 1 EDG Manifold Areas, EDGs 1H and 1J
- Unit 1 and Unit 2 294 Foot Elevation Cable Spreading Rooms
- Unit 1 Mechanical Equipment Battery Rooms 1-I and 1-III
- Unit 1 Service Building Emergency Switchgear Room and Tunnel
- Unit 2 Service Building Emergency Switchgear Room and Tunnel.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection Activities

a. Inspection Scope

The inspectors observed activities relative to inspection of the Unit 1 reactor vessel head penetrations (VHPs) in response to NRC Bulletin 2001-01. The inspection included review of nondestructive examination (NDE) procedures, assessment of NDE personnel training and qualification, and observation and assessment of in-process visual (VT) and eddy current (ET) examinations. The assessment of the in-process VT is described in section 4OA5 of this report. The activities were examined to verify licensee compliance with regulatory requirements and gather information to help the NRC staff identify possible further regulatory positions and generic communications. Specifically, the inspectors observed: (1) VT inspection using remote video of a sample of head to penetration junctions and (2) ET scanning activities of the J-Groove weld and outside diameter (OD) surface of the nozzle for penetration number 47 and ET scanning and analysis activities of the inside diameter (ID) surface of four penetrations (numbers 27, 40, 52, and 60).

In accordance with NRC Bulletin 2001-01, North Anna 1, with less than 5 effective full power years (EFPYs) from the Oconee 3 plant, would have a high susceptibility to Primary Water Stress Corrosion Cracking (PWSCC) and would need a qualified visual examination or a qualified volumetric examination of 100% of the VHPs. In response to the Bulletin, the licensee proposed to perform an effective visual (VT-2) inspection for evidence of leakage. In addition, ET inspections from under the head on the OD and ID of the penetrations and the OD of the J-Groove welds were proposed. Surface breaking indications discovered by ET would be further investigated using ultrasonic (UT) inspection techniques capable of sizing cracks, contingent upon qualification of the UT technique.

Based on results of the VT-2 examination (Section 40A5.3), the licensee identified 34 penetrations for further evaluation. These penetrations were prioritized for ET examination based on inspecting first those VHPs of more concern based on the VT-2 examination results. Two separate ET procedures were used. Procedure ISI-ET-001 was used for circumferential scanning of the J-Groove weld and axial scanning of the OD of the nozzle below the weld. These scans were mechanized using two X-wound send-receive 3 mm coils for each scanning direction. Indications greater than 6 mm were recorded with indications greater than 9mm reported for further inspection and disposition. Procedure ISI-ET-002 was used for axial scanning of the ID of the nozzles. These scans, also mechanized, used blade probes containing pancake coils for inspection of the nozzle ID from the gap between the thermal sleeve and the nozzle. The inspection area extended from approximately 1.2" above the lower end of the nozzle to approximately 2" above the highest point of the nozzle weld. All signals considered to be crack indications were reported for further inspection and disposition. The inspection techniques had been previously demonstrated capable of detecting PWSCC type manufactured cracks as well as cracks from Oconee head penetration samples.

b. Findings

The inspectors found that Inspections were being performed in accordance with approved and demonstrated procedures with trained and qualified inspection personnel. All ET examiners had significant ET experience, including experience inspecting VHPs.

One limitation was noted relative to the ID ET inspection. Because of the integral centering ring on the OD of the thermal sleeve, located at the upper edge of the J-Groove weld, a portion of the circumference of the inspection area (inside surface of the penetration behind the weld and 2" above the weld) is not accessible for ET inspection. This degree of limitation varies depending on the head curvature at individual penetrations.

1R11 Licensed Operator Requalification

a. Inspection Scope

On August 7 and August 8, the inspectors observed licensed operator requalification training involving D shift operators and supervisors. The inspectors watched two sessions of simulator training. The sessions involved a loss of volume control tank level indication, a loss of main feedwater instruments, and loss of main steam flow and pressure indications. During the observed simulator sessions, the inspectors evaluated the crew performance in, 1) knowledge of regulatory and plant technical issues, 2) use of the phonic alphabet and three-way communications, 3) use of problem-solving/decision-making skills, and 4) use of command and control techniques by supervisory personnel. The adequacy of the training evaluator's critiques was assessed.

The inspectors also attended and assessed the adequacy of the operations department meetings involving discussions of NRC Information Notice 2001-05, "Through-Wall Cracking of the Reactor Pressure Vessel CRDM Penetrations."

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule (MR) Implementation

.1 Quarterly Review

a. Inspection Scope

The inspectors reviewed implementation of the Maintenance Rule (10 CFR 50.65) using VPAP 0815, "Maintenance Rule Program," Revision 11, and Engineering Transmittal (ET) CEP-97-0018, "North Anna Maintenance Rule Scoping and Performance Criteria Matrix," Revision 12. The reviews focused on the characterization of failures, the appropriateness of the associated a(1) or a(2) classification, and the appropriateness of either the associated a(2) performance criteria or the associated a(1) goals and corrective actions. The plant issues and associated equipment issues reviewed were:

- N-2001-0122 - Unit 2C Loop Bypass Valve Packing Failure - Status of a(1) Placement
- N-2000-2313 - Unit 1A Charging Pump Unavailabilities - Status of a(1) Placement
- N-2001-2479 - Unit 1B Charging Pump Instantaneous Overcurrent Event - Discussions of MR Unavailability
- N-2001-2209 - Unit 1 Service Water Supply Pump 1-SW-P-10 For Radiation Monitor 1-RM-SW-108F - Unreliability and Maintenance Preventable Functional Failure (MPFF) Discussions
- N-2001-2538 and N-2001-2560 - Unit 1 Feedwater MOVs 150A, B, and C MOV "Cracked Worm Gear" Issues - Discussion of Possible MR Impacts
- N-2001-0122 - Unit 1 and Unit 2 RCS Valve Packing Preventative Maintenance Program Updates - Further Licensee Discussions on MR Placements.

b. Findings

No findings of significance were identified.

.2 Annual Review

a. Inspection Scope

The inspectors reviewed the licensee's periodic assessment, "2000 Maintenance Rule Periodic Assessment, North Anna Power Station, Units 1 & 2," dated January 4, 2001, for the period of 3/1/1999 - 8/31/2000, which was issued in accordance with paragraph a(3) of (10 CFR 50.65). The inspectors verified that the assessment was issued in accordance with the time requirements of the Maintenance Rule and also that the assessment included all required areas including balancing reliability and unavailability, review of a(1) activities, review of a(2) activities, and consideration of industry operating experience. To verify compliance with 10 CFR 50.65, the inspector reviewed selected activities covered by the assessment period. Additionally, the inspector reviewed

licensee actions associated with corrective actions of the 2-RC-MOV-2587 valve packing failure. The procedures and documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's scheduled or emergent work activities to assess the management of plant risk. The inspectors evaluated if the assessments of risk were performed in accordance with requirements of 10CFR50.65 (a)(4) and plant procedures. Additionally, the inspectors reviewed the licensee's actions to minimize the probability of initiating events, maintain the functional capability of mitigating systems, and maintain barrier integrity. The risk impact of performing the following work activities was assessed:

- Work Order 00449112-01; Unit 1 1A Low Head Safety Injection Pump Seal Cleaning Activities
- Work Order 00436421-01; Unit 1 1A Charging Pump/Unit 1 Instrument Air Service Water Piping Modification Activities
- Work Order 00454114-01; Steam Cleaning of a Unit 1 Service Air Compressor In Conjunction With Station Switchyard Work Activities
- Work Order 00449295-01; Installation of Strain Gage on Service Water System Valve 1-SW-MOV-108A In Conjunction With Station Blackout Diesel Testing
- Work Order 00452297-01; Repair of a Unit 1 Service Air Compressor Intercooler In Conjunction With Station Switchyard Work Activities
- Periodic Test 1-PT-75.2A; Service Water Pump 1-SW-P-1A Testing In Conjunction With Station Switchyard Work Activities.

b. Findings

No findings of significance were identified.

1R14 Nonroutine Plant Evolutions

a. Inspection Scope

The inspectors observed operations, maintenance, and engineering personnel actions associated with a July 6 rupture of a 12" fire protection fire main pipe. The inspectors reviewed the associated activities presented in related plant issue N-2001-2956. Various personnel from the above groups were also interviewed by the inspectors in order to assess the actions taken to mitigate the effects from the rupture and to further assess the post-rupture event repair/replacement activities.

On September 17, 18, and 19, the inspectors observed initial activities related to licensee inspection of the Unit 1 Reactor Vessel Head Control Rod Drive Mechanism Penetration (CRDM) weldments. The inspectors noted that licensee operations, engineering, and maintenance personnel performed initial actions specified in NRC Information Notice 2001-05, "Through-Wall Cracking of the Reactor Pressure Vessel CRDM Penetrations." Subsequent actions taken by the inspectors pertaining to this issue are noted in Sections 1R08 and 4OA5.3.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors evaluated the technical adequacy of operability evaluations to ensure that operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The reviewed operability evaluations were described in plant issues:

- N-2001-1919 and N-2001-1941 - Potential Inoperability of Instrument Air Compressor Dryers 1-IA-D-1 and 2-IA-D-1
- N-2001-1965 - Oil-Soaked Generator Cable Covering on the 2J Emergency Diesel Generator
- N-2001-2266 - Abnormal Spiking C Steam Generator Steam Flow Transmitter Channel IV
- N-2001-2358 and N-2001-2381 - Inboard Seal Leak Unit 1 C Charging Pump and Increased Seal Leakage on Unit 1 C Charging Pump
- N-2001-2456 - Fuel Oil Low Pressure Alarm Due To Alarm Module Malfunction 1H Emergency Diesel Generator
- N-2001-2199 and N-2001-2320 - Imbedded Wood in the Unit 1 Containment Dome.

b. Findings

No findings of significance were identified.

1R16 Operator Work-Arounds (OWAs)

a. Inspection Scope

The inspectors reviewed the computer data base for the operation's department work-arounds/distractions. The database contained 4 category A OWAs and 18 items classified as either distractions or nuisances. Category A identifies an OWA which could impact safe operation of the plant during a transient. However they all were factored into the cumulative effects for OWAs. Most of these work arounds/distractions were assigned to engineering personnel.

The inspectors also reviewed procedure 0-GOP-5.3, "Review of Operator Work Arounds," Revision 1. This procedure described methods for determining the cumulative and aggregate effects of OWAs/distractions.

The inspectors reviewed the following OWAs:

- 98-OWA-B25, Secondary Side Feed Water Heater Reliefs
- 96-OWA-C28 A, 1/2 MS-MOV-106/206, HP Turbine Gland Steam Header Dump PCV Bypass MOV's.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed the following post-maintenance test (PMT) procedures and activities associated with repair or replacement of the following components to determine that the procedures and test activities were adequate to verify operability and functional capability of the equipment:

- Unit 2 EDG Testing, (2-PT-82J, "2J EDG Slow Start Testing," Revision 25)
- Unit 2 Low Head Safety Injection Pump Testing (2-PT-57.1A "Emergency Core Cooling Subsystem-Low Head Safety Injection Pump 2-SI-P-1A," Revision 38)
- Unit 2 Control Room Chiller Testing, (2-PT-77.11C, "Control Room Chiller Pump and Valve Testing," Revision 20)
- Unit 1 Low Head Safety Injection Pump Testing (1-PT-57.1B "Emergency Core Cooling Subsystem-Low Head Safety Injection Pump 1-SI-P-1B," Revision 37)
- Unit 1 Charging Pump Testing, (1-PT-14.3, "Charging Pump 1-CH-P-1C," Revision 39)
- Unit 1 EDG Testing, (1-PT-83.12J, "1J Diesel Generator Test - Start By ESF Actuation," Revision 1).

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors reviewed the licensee's Unit 1, Fall 2001, outage risk control plan. The review focused on risk considerations, industry experience, and the licensee's response strategies for losses of key safety functions. The inspectors toured the Unit 1 control room on September 9 following the unit shutdown in preparation for the refueling outage. During this tour, the inspectors held discussions with control room personnel, reviewed operational logs and monitored the control room standby readiness

configuration of emergency core cooling and decay heat removal systems for mode 3 (hot standby) operations.

During the refueling outage, the inspectors observed, reviewed and evaluated, as applicable, various activities such as the 18 month 1J EDG 24 hour surveillance, routine outage reports, and maintenance rule related activities. The inspectors also observed portions of the installation and removal of a temporary vessel cover that enabled the reactor vessel to be drained once the fuel was removed from the core. This activity was performed in accordance with procedure 0-MCM-1119-01, "Installation and removal of the temporary reactor vessel cover," Revision 0. This was the first use of the cover by the licensee.

The inspectors also observed various aspects of the vessel head penetration (VHP) visual examinations which is discussed in Section 4OA5.3.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the surveillance tests listed below, the inspectors examined the test procedure and either witnessed the testing and/or reviewed test records to determine whether the scope of testing adequately demonstrated that the affected equipment was functional and operable:

- 2-PT-71.2Q, "2-FW-P-3A Motor Driven AFW Pump and Valve Test," Revision 21
- 2-PT-63.1A, "Quench Spray System - A Subsystem," Revision 24
- 2-PT-33.9, "Reactor Trip System Channel Functional Test for Reactor Coolant Pump Bus 2C Undervoltage," Revision 4
- 2-PT-71.3Q, "2-FW-P-3B Motor Driven AFW Pump and Valve Test," Revision 23
- 1-PT-63.1A, "Quench Spray System - A Subsystem," Revision 28
- 1-PT-68.6, "Testing of Containment Atmosphere Purge Blowers," Revision 2
- 1-PT-74.2A, "Component Cooling Pump 1-CC-P-1A Test", Revision 25-P1
- 1-PT-83.12H, "1H Diesel Generator Test (Start by ESF Actuation)," Revision 1.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the temporary modification log book in the control room associated with the Service Water Instrument Air compressor receiver tank (temporary

modification number 1686). A relief valve with a lift setpoint of 115 pounds per square inch was installed on Units 1 and 2 receiver tanks to prevent over pressurization of the tank due to wall thinning on the lower head. This lower setpoint will be used until the completion of design change package (DCP) 00-102, after which the relief valve setting will be returned to its original setpoint of 150 psi. The inspectors determined from a review of the safety evaluation that operation of the SW Air System was not affected by the lower relief valve setpoint since the maximum operating pressure of the system is approximately 15 psi below the lowered setpoint.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors performed a periodic review of the Safety System Functional Failures PI data for Units 1 and 2. Specifically, the inspectors reviewed PI data for the period June 2000 to June 2001. Documents reviewed included applicable unit operating reports, licensee event reports, and MR functional failure data comparisons reports. The MR functional data review included a review of the MR a(1) list to assess whether any of the listed systems had prevented or could have prevented the fulfillment of a safety function. The inspectors also discussed the PI with the PI input personnel and coordinators.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

.1 Maintenance Rule

a. Inspection Scope

The inspectors randomly selected and screened licensee records for maintenance work requests and problem evaluation reports for the period of August 2000 through August 2001. This review was to determine if the licensee was identifying problems related to the Maintenance Rule and entering them into the corrective action program.

b. Findings

No findings of significance were identified.

.2 10 CFR 50.59 Inspection

a. Inspection Scope

Section 1R02 discusses a Problem Identification and Resolution inspection finding. As part of the licensee's resolution for undersized welds, EPRI guidelines were incorrectly applied and as a result, the licensee did not adequately perform and document an engineering evaluation of two undersized welds.

b. Findings

No findings of significance were identified.

4OA3 Event Follow-up

(Closed) LER 50-339/2000-001-00: control rod deviation monitor inoperable due to personnel error. The inspectors reviewed the licensee's corrective actions associated with the failure to meet the requirements of Technical Specifications (TS) 3.1.3.2 for the Unit 2 inoperable control rod position deviation monitor. The licensee attributed personnel error as the cause of the event due to the computer programming which blocked the control rod position deviation signals above 235 steps. The corrective action involved reprogramming the process computer system to enable it to detect the control rod position deviation signals above 235 steps. The inspectors confirmed that the corrective actions taken on Unit 2 were also performed on Unit 1. No new findings were identified in the inspectors' review. This is a minor violation not subject to formal enforcement. This item is in the licensee's corrective action program as Plant Issue N-2000-0480.

4OA5 Other

.1 Transportation of Spent Fuel Cask (Inspection Procedure 60855, 10CFR72 Inspection)

a. Inspection Scope

The inspectors reviewed cask crane operating, cask transporting, and transporter operating procedures. The inspectors observed that the licensee transported the loaded cask from the crane bay area to the cask storage area. The inspectors observed the heavy weight truck driving behind the transporter in case of the brake failure on slopes. The inspectors reviewed crane operator training certificates and qualification records.

b. Findings

No findings of significance were identified.

.2 Review of 10 CFR 72.48 Evaluations (Inspection Procedure 60857)

a. Inspection Scope

The inspectors selected and reviewed two safety evaluations for the changes. The inspectors reviewed the safety evaluation for the radiograph density variations for the flange to inner shell weld of TN-32 Cask 21 which did not meet standard acceptance criteria. The inspectors reviewed another safety evaluation which evaluated that a weld repair performed on the TN-32 Cask 19 inner shell was acceptable after the initial inspection criteria were not met.

b. Findings

No findings of significance were identified.

.3 Vessel Head Penetration Visual Testing (Temporary Instruction 2515/145)

a. Inspection Scope (TI 2515/145)

The inspectors reviewed the visual inspection program for reactor vessel head penetrations as discussed in North Anna Power Station (NAPS) response to NRC Bulletin 2001-01. The inspection guidelines were provided in NRC Temporary Instruction (TI) 2515/145, "Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles" (NRC Bulletin 2001-01).

b. Findings

1) Verification that visual examination was performed by qualified and knowledgeable personnel:

The inspectors verified the ASME VT-2 qualifications for the personnel responsible for performance of the visual examinations. In addition, the inspectors verified that examination personnel had received specialized industry-developed training on the visual examination methods for leakage of reactor head penetrations and on the site specific procedures to be used for the examinations. The inspectors interviewed the examination personnel and noted that they were knowledgeable of the specialized qualification criteria. The inspectors verified that all visual examination personnel were certified as Level III, VT-2. Also see Section 1R08.

2) Verification that visual examination was performed in accordance with approved and adequate procedures:

The inspectors verified that the visual examination was performed in accordance with Virginia Power Administrative Procedure (VPAP) - 1103, ASME Section XI Visual Examination Program (VT-1, 2, 3 & General) and contract vendor procedure MRS-SSP-1187, Reactor Vessel Head Penetration Remote Visual Inspections for North Anna Unit1. The inspectors determined by reviewing these procedures that they were adequate for the performance of VHP visual examinations for boric acid deposits. The inspectors verified by direct observation and in discussions with examination personnel

that the acceptance criteria and/or critical parameters for VHP leakage were applied in accordance with the procedures. However, at the end of the report period, the licensee had not provided to NRC the bases for their position that the inspection performed by these procedures constituted a qualified visual inspection.

3) Verification that the licensee was able to identify, disposition, and resolve deficiencies:

The inspectors verified that the licensee's inspection plan provided nozzle indexing and drawings with adequate guidance to ensure that the visual examinations included 100% circumferential coverage of each VHP. The inspectors verified that the examination result for each penetration was individually documented. The examination procedure provided acceptance criteria for the VT-2 examination with specific follow-up actions for the detection of boric acid residues or identified leakage. The procedure required that questionable control rod drive mechanism penetration leakage be identified as a leaking nozzle. Thirty four (34) of the 65 VHPs inspected had relevant VT-2 indications due to boric acid accumulations. Additional reviews of video tapes resulted in the disposition of 7 of them, thus leaving the remaining 27 to be dispositioned by eddy current and/or ultrasonic testing. None of these penetrations with relevant VT-2 indications were similar to the boron deposit (pop corning) seen at Oconee Unit 2 and 3.

The VT-2 examination of penetration 50 did indicate a one-of-a-kind boron deposit. This nozzle penetration exhibited a white, wicked shaped, ooze like form of boron crystals that were extruded from the nozzle annulus around the penetration. Based upon this characterization, the licensee initially characterized it as having a potential for significant leak. After the inspection report period, the licensee performed additional non-destructive testing of this penetration which included liquid penetrant testing of the J groove weld. A portion of the thermal sleeve was also removed to allow ultrasonic testing of the inside diameter of the penetration above the J groove weld. The licensee found no evidence of through wall flaws from the analysis of the NDE. Additional information concerning the licensee's activities for penetration 50 and the resolution and disposition of the other 26 penetrations, identified by the visual for further NDE, will be discussed in a future NRC inspection report.

4) Verification that the licensee was capable of identifying the Primary Water Stress Corrosion Cracking (PWSCC) phenomenon described in the bulletin:

Based on the adequate resolution of the remote video examination equipment, the 100% circumferential coverage of each VHP, and the qualification of the examination personnel; the inspectors concluded that the licensee would have identified leaking penetrations that exhibited the Oconee Unit 2 and 3 boron deposits.

5) Evaluate condition of the reactor vessel head (debris, insulation, dirt, boron from other sources, physical layout, viewing obstructions):

The inspectors remotely observed via video camera that the vessel head was covered with large amounts of boric acid deposits and peeling paint. Much of the boric acid deposits was from past leaks at the thermocouple Conoseal canopy seal welds. Boric acid flow from above the head through openings in the insulation produced

accumulations on the head that presented difficulties in performing visual inspections for potential leakage at the VHP annulus area of the vessel head. The boric acid and other debris accumulations on the vessel head caused binding of the magnetic wheels on the trolley used to transport the camera. In spite of these problems, the inspectors concluded, based on direct observations and review of portions of the VT-2 video tapes, that the licensee was able to adequately view (100% circumferential coverage) each of the 65 VHP's during the visual examinations.

6) Evaluate ability for small boron deposits, as described in the bulletin, to be identified and characterized:

The inspectors observed that the licensee was able to disposition the relevant indications with small boron deposits through demonstrating that they resulted from leaks which had leaked from above external sources.

7) Determine extent of material deficiencies (associated with the concerns identified in the bulletin) which were identified that required repair:

No examples of VHP leakage or material deficiencies were identified during the examination.

8) Determine any significant items that could impede effective examinations and/or ALARA issues encountered

The inspectors noted no ALARA issues limited the scope of examinations.

4OA6 Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. D. Heacock, Site Vice President, and other members of the licensee's staff on October 16, 2001. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

D. Christian, Senior Vice President and Chief Nuclear Officer
K. Barnette, Superintendent, Site Industrial Safety/Fire Protection
J. Davis, Manager, Station Nuclear Safety and Licensing
C. Funderburk, Manager, Station Operations and Maintenance
D. Heacock, Site Vice President
E. Hendrixson, Superintendent, Station Engineering
P. Kemp, Director, Nuclear Oversight
L. Lane, Superintendent, Operations
T. Maddy, Superintendent, Station Security
G. Modzelewski, Project Engineer (Vessel Head Penetration Inspection Lead)
Q. Parker, Maintenance Rule Coordinator
W. Renz, Director, Security and Emergency Preparedness
H. Royal, Superintendent, Nuclear Training
D. Schappell, Superintendent, Site Services
J. Schleser, ALARA Coordinator
R. Shears, Superintendent, Maintenance
A. Stafford, Superintendent, Radiological Protection

ITEMS CLOSED

Closed

50-339/2000-001-00	LER	Control rod deviation monitor inoperable due to personnel error (Section 4OA3)
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LIST OF DOCUMENTS REVIEWED

Section 1R02:

Procedure

VPAP-3001 "Safety and Regulatory Reviews," Revision 7

Safety Evaluations (SE)

99-SE-OT-21	Lowering the water stand-by temperatures for the Emergency Diesel Generator Engines during warm weather months
99-SE-OT-28	Reducing weld inspection program on high energy piping, main steam and feedwater, outside of containment
99-SE-PROC-15	Allowing an alternative method to fill the Chilled Water expansion tank if the normal flow path is unavailable

98-SE-MOD-018	Installing an additional Component Cooling (CC) water return line from the PDTT cooler, etc.
00-SE-PROC-01	Change on the wire jumper, removal of AAC sequence relay timers, and reworking the procedural steps for Procedure 0-PT-82.14, SBO Diesel Generator Test
00-SE-PROC-14 99-SE-OT-01	Allowing maintenance to be done on the alternative charging header Justification for Using 14 days allowed outage time action statement for the backup nitrogen accumulators
99-SE-PROC-10 99-SE-MOD-12	Defeating operation of Directional Overcurrent relay on 1-EE-BKR-15H11 The acceptability of individually overriding automatic trips for the Unit 1 and 2 High Capacity Steam Generator Blowdown System
99-SE-JCO-02 99-SE-OT-40	Primary Ventilation Alignment, Revision 1 The environmental impact on adjacent EQ rooms from a high energy line break in the turbine building
00-SE-OT-60	The consideration of pressure and temperature measurement uncertainties in various systems, Revision 1

Screened Out

ET-CE-99-003	Improving nitrogen bottle handling for reserve station service transformers 1-EP-ST-2A/2B/2C
ET-CE-99-001	As-built support details
ET-CE-99-031	Evaluation of base plate with broken Hilti bolt
ET-N-00-001	Installing anti-rotation device for 1-CH-HCV-1244
ET-N-00-043	Evaluations of Units 1/2 Emergency Switchgear Room barrier gaps
ET-TI-99-005	Deferral of stroke test on 2-FW-FCV-2498
CH-21.131	Pressurizer liquid: sampling by purging to sink
HP-3010.033	Unplanned gaseous release
ICP-SW-1-F-103	Service water spray array flow A
0-MCM-0103-01	Repair of the charging and safety injection pump
0-OP-6.4	Operation of the SBO diesel (SBO Event)

Other Documents

Electric Power Research Institute Report No. NP-5380, Visual Weld Acceptance Criteria - Volume 1: Visual Weld Acceptance Criteria for Structural Welding at Nuclear Power Plants (NCIG-01, Revision 2)

Technical Report CE-0103, Pipe Support Weld Inspection Effort, Revision 0

Section 1R12:

Maintenance Rule Implementation Documents, Plant Issues, and Procedures

2000 Maintenance Rule Periodic Assessment, North Anna Power Station, Units 1 & 2, dated January 4, 2001, for the period of 3/1/1999 - 8/31/2000

NAPS (a)(1) SSCs Report (through 7/27/01)

The following 33 Plant Issues for the 3rd Quarter 2001 covering 11 systems:

N-2001-2192, N-2001-2086, N-2001-2058, N-2001-2127, N-2001-1976,
N-2001-1971, N-2001-1930, N-2001-2174, N-2001-2182, N-2001-2200,
N-2001-2212, N-2001-2243, N-2001-2262, N-2001-2266, N-2001-2226,
N-2001-2015, N-2001-2167, N-2001-2172, N-2001-2213, N-2001-2268,

N-2001-2042, N-2001-2283, N-2001-2169, N-2001-2184, N-2001-2010,
N-2001-2300

NAPS Maintenance Rule Monthly Review Report, July 2001
VPAP-0815, "Maintenance Rule Program," Rev 11
North Anna Power Station System Health Report, 2nd Quarter 2001
MPFF's Mark Number Report (1-CC-P-1A)
Unit 1 & 2 (a)(1)'s with Corrective Actions Report
Current Unavailability by Mark Number Report and MR Function Reports
MRule Working Group Meeting Minutes - 8/7/01, 7/24/01 & 2/20/01
Self-Assessments:
00-11: Maintenance, 1/17/01
00-04: Design Control and Engineering Programs
Re: 2-RC-MOV-2587 Valve
NA Maintenance Rule Scoping and Performance Criteria Matrix
MPFF's Mark Number Report (2-RC-MOV-2587)
MPFF's by Function Report (RC002)
Plant Issue N-2001-0122
MR Evaluation - N-2001-0122-E2
MR Evaluation Response - N-2001-0122-E2
Unavailability by Component Report as of 8/22/01 (RC)
LER 50-339/2001-001-00
MPFF's and MRFF's by System Report
Unit 1 & 2 A-1 Status Log

Section 1R08:

Westinghouse Field Services Procedure ISI-ET-001, Revision 0, Eddy Current Inspection of
J-Groove Welds in Vessel Head Penetrations
Westinghouse Field Services Procedure ISI-ET-002, Revision 0, Eddy Current Procedure for
Detection of Cracks in Vessel Head Penetrations with or without Thermal Sleeves - Differential
Gap Probe
Licensee Letter Serial 01-490 dated August 31, 2001, Response to NRC Bulletin 2001-01
Qualification and Training Records for NDE Examiners

Sections 4OA5.1 and 4OA5.2:

Procedures

0-OP-4.3 "Operation of Spent Fuel Cask Crane 1-MH-CR-15," Revision 9
0-OP-4.36 "Cask Transport from the Crane Bay to the ISFSI," Revision 6
0-OP-4.39 "Dry Cask Transporter Operation," Revision 4

Safety Evaluations

00-SE-OT-24 The radiography density variations for the flange to inner shell weld of TN-32
Cask 21 not meeting the requirements
00-SE-OT-41 The inspection requirements for a weld repair performed on the TN-32 Cask 19
inner shell weld were not met