



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931**

October 27, 2003

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: SURRY POWER STATION - NRC INTEGRATED INSPECTION REPORT
05000280/2003004, 05000281/2003004, AND 07200002/2003001**

Dear Mr. Christian:

On September 27, 2003, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Surry Power Station, Units 1 and 2, and the Surry Independent Spent Fuel Storage Installation. The enclosed integrated inspection report documents the inspection findings, which were discussed on October 9, 2003, with Mr. Sowers 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 selected procedures and records, observed activities, and interviewed personnel.

This report documents one NRC-identified finding of very low safety significance (Green) which was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region II; the Director Office of Enforcement, Nuclear Regulatory Commission, Washington DC 20555-001; and the NRC Resident Inspector at the Surry Power Station.

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In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) 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/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

//RA//

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

Docket Nos.: 50-280, 50-281, 72-002
License Nos.: DPR-32, DPR-37, SNM-2501

Enclosure: Integrated Inspection Report 05000280, 281/2003004 and 07200002/2003001
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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cc w/encl:

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-280, 50-281, 72-002

License Nos.: DPR-32, DPR-37, SNM-2501

Report Nos.: 05000280/2003004, 05000281/2003004, 07200002/2003001

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: Surry Power Station, Units 1 & 2
Surry Independent Spent Fuel Storage Installation

Location: 5850 Hog Island Road
Surry, VA 23883

Dates: June 29 - September 27, 2003

Inspectors: G. McCoy, Senior Resident Inspector
D. Arnett, Project Engineer (Sections 1R05, 1R06, 1R19, 1R22, 4OA1.2,
4OA1.3, 4OA1.4)
J. Blake, Sr. Project Manager (Sections 1R02, 1R17)
R. Chou, Reactor Inspector (Sections 4OA5.1, 4OA5.2)
B. Crowley, Sr. Reactor Inspector (Consultant) (Sections 4OA5.3,
4OA5.4)
P. Fillion, Reactor Inspector (Section 4OA5.5)
M. Maymi, Reactor Inspector (Sections 1R02, 1R17)
L. Mellen, Sr. Operations Engineer (Sections 1EPI, 1EP4, 4OA1)
R. Musser, Senior Resident Inspector, Harris Power Station
(Sections 1R05, 1R11)
W. Rogers, Sr. Reactor Analyst (Section 4OA5.5)
W. Sartor, Sr. Emergency Preparedness Inspector (Sections 1EPI, 1EP4,
4OA1)
S. Walker, Reactor Inspector (Sections 1R02, 1R17)

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

Enclosure

SUMMARY OF FINDINGS

IR 05000280/2003004, IR 05000281/2003004, IR 07200002/2003001; 06/29/2003 - 09/27/2003; Surry Power Station, Units 1 & 2 and Independent Spent Fuel Storage Installation; Other Activities.

The report covered a three month period of inspection by resident inspectors, project engineers, reactor inspectors, an operations engineer, a reactor analyst, an emergency preparedness inspector and a project manager. One Green NCV was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion III, Design Control because emergency diesel generator (EDG) no. 3 could have been overloaded following a concurrent loss-of-offsite power on Units 1 and 2. The licensee has resolved the problem through a modification of the breaker control circuitry.

This finding is greater than minor because it is associated with EDG performance and affects the mitigating systems cornerstone objective. The finding is of very low safety significance because the inspectors determined that the automatically connected loads are less than the 168-hour rating of the EDG. (Section 4OA5.5)

B. Licensee Identified Violations

None.

Enclosure

REPORT DETAILS

Summary of Plant Status

Unit 1 started the report period at 100 percent power. On September 5, 2003, Unit 1 power was reduced to 50 percent to perform repairs on 1-FW-P-1B (B Main Feedwater Pump), returning to full power on September 8. On September 18 a manual trip of Unit 1 was initiated due to a complete loss of circulating water pumps during Hurricane Isabel. The unit was returned to full power on September 22.

Unit 2 operated at power until September 18, when a manual trip of Unit 2 was initiated due to a complete loss of circulating water pumps during Hurricane Isabel. The unit was maintained shutdown and a scheduled refueling outage was commenced.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

.1 Hot Weather Preparations

a. Inspection Scope

The inspectors verified that plant design features and procedures protected plant mitigating systems from adverse hot weather effects. Specifically, inspectors walked down the Unit 1 main steam valve house and safeguards buildings and evaluated the capability of the safety related systems to operate during high ambient temperature conditions. The inspectors also reviewed Operations Checklist (OC) 21 "Severe Weather Checklist" to verify that adequate compensatory actions were taken to mitigate the effects of actual hot weather.

b. Findings

No findings of significance were identified.

.2 Hurricane Preparations

a. Inspection Scope

The inspectors evaluated the implementation of the adverse weather preparation procedures and compensatory measures prior to the arrival of Hurricane Isabel. Inspectors reviewed Operations Checklist (OC) 21 "Severe Weather Checklist," Abnormal Procedure (AP) 37.01 "Abnormal Environmental Conditions," and the Dominion Hurricane Response Plan (Nuclear) (HRP-N). Inspectors assured that vital systems and components were protected from high winds and flooding associated with hurricanes. Additionally, the inspectors conducted walkdowns of the plant to check for any vulnerabilities, such as inadequate sealing of water tight penetrations, inoperable sump pumps, and other sources of potential internal and external flooding.

b. Findings

No findings of significance were identified.

1R02 Evaluations of Changes, Tests or Experiments

a. Inspection Scope

The inspectors reviewed selected samples of evaluations to confirm that the licensee had appropriately considered the conditions under which changes to the facility, Updated Final Safety Analysis Report (UFSAR), or procedures may be made, and tests conducted, without prior NRC approval. The inspectors reviewed evaluations for five changes and additional information, such as calculations, supporting analyses, the UFSAR, drawings, and procedures to confirm that the licensee had appropriately concluded that the changes could be accomplished without obtaining a license amendment. The inspectors also reviewed one change that had resulted in the licensee requesting Independent Spent Fuel Storage Installation (ISFSI) Technical Specification Change number TS-18. The six evaluations reviewed are listed in the List of Documents Reviewed.

The inspectors also reviewed samples of changes such as design changes, UFSAR changes, a procedure change, and licensee commitments changes for which the licensee had determined that regulatory evaluations were not required. The review was to confirm that the licensee's conclusions to "screen out" these changes were correct and consistent with 10CFR50.59. The fourteen "screened out" changes, reviewed by the inspectors, are listed in the List of Documents Reviewed.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

For the systems identified below, the inspectors reviewed plant documents to determine correct system lineup, and observed equipment to verify that the system was correctly aligned:

- Unit 2 A and B motor driven auxiliary feedwater pumps and turbine driven auxiliary feedwater pump (drawings 11548-FM-068A sheet 1, 3, and 4) while the number 2 emergency diesel generator (EDG) was out of service for testing.
- Unit 2 B low head safety injection pump (drawings 11548-FM-89A sheets 1 and 2) when the number 2 emergency diesel generator (EDG) out of service for testing.
- Service water supply to the Units 1 and 2 component cooling water heat exchangers (drawing 11448-FM-71A) during hot weather.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors conducted tours of the following areas to assess the adequacy of the fire protection program implementation. The inspectors checked for the control of transient combustibles and the condition of the fire detection and fire suppression systems (using “Surry Power Station Appendix R Report”) in the following areas:

- Blackout diesel building,
- Unit 2 emergency switchgear room,
- Unit 1 normal switchgear room,
- Battery room 1A,
- Battery room 2A,
- Unit 1 safeguards building, and
- Mechanical equipment room number 4.

b. Findings

No findings of significance were identified.

1R06 Flood Protection

a. Inspection Scope

The inspectors reviewed the licensee’s flooding mitigation plans and equipment to determine consistency with design requirements and risk analysis assumptions. Walkdowns were conducted of the interior and exterior walls of the turbine building to review compliance with external flooding criteria. To review internal flooding, the Unit 1 piping tunnel flood barrier and mechanical equipment room 4 flood dike were reviewed to verify compliance with calculated flood platform heights, penetrations and internal flooding water barrier requirements. The maintenance history of the turbine building flood level Indicators was also reviewed. The documents reviewed are listed in the attachment to this report.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors evaluated the condition of the component cooling water (CCW) heat exchangers. The inspectors discussed as-found conditions, condition monitoring, and historical performance of the CCW heat exchangers with engineering personnel. The inspectors also observed the performance of surveillance procedure 1-OSP-SW-004, "Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger 1-CC-E-1C."

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed licensed operator performance during simulator training session RQ-03.5-ST-3-DRR to determine whether the operators:

- were familiar with and could successfully implement the procedures associated with recognizing and recovering from a reactor coolant pump (RCP) thermal barrier failure, high reactor coolant pump seal leakoff flow, an excessive RCS leak, and a large break loss of coolant accident;
- recognized the high-risk actions in those procedures; and,
- were familiar with related industry operating experiences.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

For the equipment issues described in the plant issues listed below, the inspectors evaluated the licensee's effectiveness of the corresponding preventive and corrective maintenance. For each selected item below, the inspectors performed a detailed review of the problem history and surrounding circumstances, evaluated the extent of condition reviews as required, and reviewed the generic implications of the equipment and/or work practice problem. Inspectors performed walkdown of the accessible portions of the system, performed in-office reviews of procedures and evaluations, and held discussions with system engineers. Inspectors compared the licensee's actions with the requirements of the Maintenance Rule (10 CFR 50.65) VPAP 0815, "Maintenance Rule Program," and the Surry Maintenance Rule Scoping and Performance Criteria Matrix.

- Plant Issue S-2003-0329, "Unit 1 turbine driven auxiliary feedwater pump (1-FW-P-2) overspeed trip;" and
- Plant Issue S-2003-0805, "Through-wall leak found on 1-SW-119 valve body."

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated the adequacy, accuracy, and completeness of plant risk assessments performed prior to changes in plant configuration for maintenance activities or in response to emergent conditions. When applicable, inspectors assessed if the licensee entered the appropriate risk category in accordance with plant procedures. Specifically, the inspectors reviewed the units during the following conditions:

- 1-CN-TK-3 (Unit 1 emergency condensate make-up tank), 1-MS-RV-101A (steam generator A power operated relief valve), and 2-CN-P-1A (Unit 2 A condensate pump), out of service for maintenance with the performance of 2-PT-8.1A (reactor protection system logic test) and 2-IPT-FT-RP-SI-001A/B (train A/B safeguard actuation logic functional test);
- 1-CN-TK-3 (Unit 1 emergency condensate make-up tank), 1-MS-RV-101A (steam generator A power operated relief valve), 1-IA-C-4B (Unit 1 containment instrument air compressor) and the loss of 1-EP-TRAN-1G (Unit 1 screenwell transformer) due to a lightning strike;
- 1-CN-TK-3 (Unit 1 emergency condensate make-up tank), 1-MS-RV-101A (steam generator A power operated relief valve), 2-EE-EG-1 (number 2 emergency diesel generator), 2-CH-P-1A (Unit 2 A charging pump) and 1-CH-P-2D (D boric acid transfer pump) out of service for maintenance;
- 1-CN-TK-3 (Unit 1 emergency condensate make-up tank), 1-MS-RV-101A (steam generator A power operated relief valve), 2-CH-P-1B (Unit 2 B charging pump) 1-SW-P-1B (B emergency service water pump) 1-VS-AC-6 (Unit 1 emergency switchgear room air handling unit), 1-IA-C-4A (Unit 1 containment instrument air compressor, out of service for maintenance with the #2 switchyard transformer tagged out for 1-EP-BKR-H202 replacement and performance of 2-PT-8.5 (Unit 2 consequence limiting system logic testing);
- 2-EP-BKR-2549 (Unit 2 H stub bus) tagged out for maintenance with performance of 1-PT-8.1 (unit 1 reactor protection system logic test) and 1-IPT-FT-RC-T-422 (delta T and Tav_g protection logic test); and
- Unit 1 risk analysis with Unit 2 in cold shutdown, 2-FW-P-2 (Unit 2 turbine driven auxiliary feedwater pump) unavailable for cross-connect and load shed system activated.

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Nonroutine Evolutions and Events

a. Inspection scope

For the non-routine event described below, the inspectors performed personal observations, reviewed operator logs, plant computer data, and strip charts to evaluate plant and operator performance. The inspectors verified that personnel performance was in accordance with plant procedures.

- Control room operator performance during Hurricane Isabel, including the loss of all circulating water pumps and manual trip of Units 1 and 2.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors evaluated the technical adequacy of the 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 operability evaluations were described in the engineering transmittal (ET) and plant issues listed below:

- Plant Issue S-2003-3050, "Damage to the thrust bearing on the Unit 1 turbine driven auxiliary feedwater pump (1-FW-P-2);"
- Engineering Transmittal S-2003-0202, "Evaluation of unit 1 computer enhanced rod position indication (CERPI) M-10 spiking;"
- Plant Issue S-2003-3292, "B emergency service water pump (1-SW-P-1B) coolant temperature in the alert range;"
- Plant Issue S-2003-3333, "Unit 2 emergency switchgear room damper repair;" and
- Plant Issue S-2003-3424, "Unit 2 A charging pump (2-CH-P-1A) lube oil pump coupling repair."

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors evaluated the design change packages (DCPs) for 12 modifications in the Initiating Events and Mitigating Systems cornerstone areas, to evaluate the modifications for adverse affects on system availability, reliability, and functional capability. The modifications and the associated attributes reviewed are as follows:

- DCP 00-035 Charging Pump SW Pump Suction Gage Installations
- Operations
 - Process Medium
 - Licensing Basis
 - Design basis review
- DCP 01-029 SD Level Transmitter 38-02-SD-LT-21
- Post modification calibration testing criteria and results
 - Replacement component compatibility
 - Adequate energy requirements met
 - Necessary setpoints are established
- DCP 01-070 Replacement of the Control Room Chiller 480V Molded Case Circuit Breakers
- Energy requirements adequate to supply loads
 - Replacements meet necessary standards and codes
 - Voltage and current requirements bound by change
 - Functional test results
 - Plant procedure and critical drawing updating
- DCP 02-014 Elimination of Rigid Valve Operator Support for 2-RH-FCV-2605
- Licensing Basis
 - Structural
 - Code requirements, and seismic requirements
 - Design Basis Review
- DCP 02-019 Pressurizer PORV Backup Air System Pressure Regulator Setpoint Change
- Energy Needs
 - Timing
 - Operations
 - Licensing Basis
 - Functional test results
 - Design Basis Review
- DCP 88-006 S/G Upper Support Elimination
- Licensing Basis
 - Structural
 - Code requirements, and seismic requirements
 - Design Basis Review
- DCP 98-050 SW Emergency Service Water Pump Modification
- Licensing Basis
 - Structural
 - Design Basis Review
- DCP 02-016 Trip Unit Replacement for ACC 480V MCC OM-1 Breaker 04M1-3/S
- Materials/Replacement Components compatibility, Code requirements, and seismic requirements

- Response time bounds acceptance criteria
 - Control signals are appropriate for function
 - Supporting vendor analyses
 - Plant procedure and critical drawing updating
- DCP 02-031 PZR PORV Backup Air System Pressure Regulator Setpoint Change
- Energy Needs
 - Operations
 - Licensing Basis
 - Design Basis Review
- DCP 02-065 Component Cooling Return from RHR Setpoint Change
- Operations
 - Licensing Basis
 - Design basis review
- DCP 03-049 Setpoint Change for Feedwater Auxiliary Lube Oil Pump Pressure Switches
- Operations
 - Process Medium
 - Licensing Basis
 - Functional Test Results
 - Design basis review
- DCP 01-005I ISFSI Technical Specification Change Request No. 18
- Supporting license basis and safety evaluation documentation
 - License basis documents updated

The inspectors also reviewed a listing of Plant Issues (PIs) associated with modifications to determine what problems had been identified and to whether there were any trends that could be identified. The inspectors reviewed three PIs that were generated as a result of this inspection. The PIs were reviewed for appropriate description of the issue, listing of apparent cause, and actions/proposed actions by the licensee. The PIs identified were as follows:

- Plant Issue - S-2003-3535
- Plant Issue - S-2003-3536
- Plant Issue - S-2003-3539

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the post maintenance test procedures and activities associated with the repair or replacement of the following components to determine whether the procedures and test activities were adequate to verify operability and functional capability following maintenance:

- Work Order (WO) 00486499-02, "Repair leaking charging pump service water sensing line;"
- WO 00494326-01, "Replace 3" flanged globe valve downstream of 1-SW-P-1B;"
- WO 00483559-01, "Inspection of 1-CH-P-1A thrust bearing;"
- WO 00496203-01, "1-CC-P-2B coupling replacement;"
- DCP 02-030, "Emergency diesel generator number 2 air start system modifications;"

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (Unit 2)

a. Inspection Scope

The inspectors performed the inspection activities described below for the Unit 2 refueling outage that began on September 18, 2003.

The inspectors also reviewed the licensee's outage risk control plan "Unit 2 2003 Refueling Outage Safety Assessment," and VPAP-2805, "Shutdown Risk Program," to verify that the licensee had appropriately considered risk, industry experience and previous site specific problems, and to confirm that the licensee had mitigation/response strategies for losses of key safety functions.

During the cooldown which preceded the outage, the inspectors reviewed portions of the cooldown process to verify that technical specification cooldown restrictions were followed.

The inspectors confirmed that, when the licensee removed equipment from service, the licensee maintained defense-in-depth commensurate with the outage risk control plan for key safety functions and applicable technical specifications, and that configuration changes due to emergent work and unexpected conditions were controlled in accordance with the outage risk control plan.

During the outage, the inspectors:

- Reviewed reactor coolant system (RCS) pressure, level, and temperature instruments to verify that those instruments were installed and configured to provide accurate indication; and that instrumentation error was accounted for;

- Reviewed the status and configuration of electrical systems to verify that those systems met technical specification requirements and the licensee's outage risk control plan;
- Observed decay heat removal (DHR) parameters to verify that the system was properly functioning;
- Reviewed system alignments to verify that the flow paths, configurations, and alternative means for inventory addition were consistent with the outage risk plan;
- Reviewed selected control room operations to verify that the licensee was controlling reactivity in accordance with the technical specifications; and
- Reviewed the outage risk plan to verify that activities, systems, and/or components which could cause unexpected reactivity changes were identified in the outage risk plan and were controlled accordingly;

The inspectors reviewed the licensee's plans for changing plant configurations to verify on a sampling basis that technical specifications, license conditions, and other requirements, commitments, and administrative procedure prerequisites were met prior to changing plant configurations.

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:

- 0-NSP-CW-001, "High level intake structure canal level probes inspection;"
- 0-EPT-0104-01, "Semi-annual station battery test;"
- 2-OPT-FW-003, "Turbine driven auxiliary feedwater (AFW) pump (2-FW-P-2) periodic test;"
- 2-OPT-FW-007, "Turbine driven AFW pump steam supply line check valve test;"
- 2-OPT-CH-002, "Charging pump operability and performance test for 2-CH-P-1B;" and
- 0-EPT-0109-03, "Emergency diesel generator battery pilot cell and bus voltage checks."

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness1EP1 Exercise Evaluationa. Inspection Scope

The inspectors reviewed the scope, objectives, and scenario for the Surry Nuclear Station biennial, full-participation 2003 emergency response exercise to determine whether they were designed to suitably test major elements of the licensee's emergency plan per 10 CFR 50, Appendix E Section IV.F.2.f. During the period July 14-19, 2003, the inspectors observed and evaluated the licensee's performance in the exercise, as well as selected activities related to the licensee's conduct and self-assessment of the exercise. On July 15, the inspectors observed the conduct of the exercise to ensure that employees of the licensee were familiar with their specific emergency response duties per 10 CFR 50, Appendix E Section IV.F.1.(a). Licensee activities observed during the exercise included those occurring in the Control Room Simulator (CRS), Technical Support Center (TSC), Operational Support Center (OSC), and Local Emergency Operations Facility (LEOF). The NRC's evaluation focused on the risk-significant activities of event classification, notification of governmental authorities, onsite protective actions, offsite protective action recommendations, and accident mitigation. The inspectors also evaluated command and control, the transfer of emergency responsibilities between facilities, communications, adherence to procedures, and the overall implementation of the emergency plan. On July 18, the inspectors attended the critique presentation to management to evaluate the licensee's critique of Emergency Response Organization performance against the requirements of 10 CFR 50, Appendix E Section IV.F.2.g.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level and Emergency Plan Changesa. Inspection Scope

The inspector reviewed changes to the Radiological Emergency Plan (REP) as contained in Revision 46, effective January 13, 2003, against the requirements of 10 CFR 50.54(q) to determine whether any of the changes decreased REP effectiveness.

b. Findings

No findings of significance were identified.

4 OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Emergency Preparedness Cornerstone

a. Inspection Scope

On July 15-17, 2003, licensee records were reviewed to determine whether the submitted PI values through the second quarter of 2003 were calculated in accordance with the guidance contained in Section 2.4 (Emergency Preparedness Cornerstone) of Nuclear Energy Institute (NEI) 99-02, Revision 2, "Regulatory Assessment Performance Indicator Guideline."

- Emergency Response Organization (ERO) Drill/Exercise Performance
- ERO Drill Participation
- Alert and Notification System Reliability

The inspector assessed the accuracy of the PI for ERO drill and exercise performance (DEP) over the past eight quarters through review of a sample of drill and event records. The inspector reviewed training records to assess the accuracy of the PI for ERO drill participation during the previous eight quarters for personnel assigned to key positions in the ERO. The inspector assessed the accuracy of the PI for the alert and notification system reliability through review of a sample of the licensee's records of the semiweekly silent tests and quarterly full-cycle tests.

b. Findings

No findings of significance were identified.

.2 "Unplanned Power Changes per 7000 Critical Hours" Performance Indicator

a. Inspection Scope

The inspectors performed a periodic review of the "Unplanned Power Changes per 7000 Critical Hours" performance indicator for Units 1 and 2. Specifically, the inspectors reviewed this performance indicator from the third quarter of 2002 through the second quarter of 2003. Inspectors evaluated whether the performance indicator was calculated in accordance with the guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline." Documents reviewed included applicable monthly operating reports, licensee event reports, and operator logs.

b. Findings

No findings of significance were identified.

.3 “Scrams with Loss of Normal Heat Removal” Performance Indicator

a. Inspection Scope

The inspectors performed a periodic review of the “Scrams with Loss of Normal Heat Removal” performance indicator for Units 1 and 2. Specifically, the inspectors reviewed this performance indicator from the third quarter of 2002 through the second quarter of 2003. Inspectors evaluated whether the performance indicator was calculated in accordance with the guidance contained in NEI 99-02, “Regulatory Assessment Performance Indicator Guideline.” Documents reviewed included applicable monthly operating reports, licensee event reports, and operator logs.

b. Findings

No findings of significance were identified.

.4 “Safety System Functional Failures” Performance Indicator

a. Inspection Scope

The inspectors performed a periodic review of the “Safety System Functional Failures” performance indicator for Units 1 and 2. Specifically, the inspectors reviewed this performance indicator from the third quarter of 2002 through the second quarter of 2003. Inspectors evaluated whether the performance indicator was calculated in accordance with the guidance contained in NEI 99-02, “Regulatory Assessment Performance Indicator Guideline.” Documents reviewed included applicable monthly operating reports, licensee event reports, and operator logs.

b. Findings

No findings of significance were identified.

4OA5 Other Activities

.1 Observation of Dry Cask Loading (60855)

a. Inspection Scope

The inspectors observed: lifting the empty spent fuel dry storage cask TN-32-35 into the spent fuel pool loading pit; loading spent fuel assemblies into the cask; verification of assemblies loaded into the cask; setting the lid on the top of canister; verification of positive engagement of lifting devices positioned; lifting the loaded cask above the water surface; draining a small portion of water from the cask for the lid bolting; removing water from bolt holes; hand tightening lid bolts; draining the water from the cask; moving the loaded cask to the cask setting area by following the heavy load lifting path; drying the cask; backfill with helium; and verification of torque on lid bolts. Observations were compared to the licensee’s procedures to ensure compliance.

The inspectors observed and verified that seven spent fuel assemblies were removed from the correct locations of the spent fuel pool and inserted into the designated locations of the canister as 1, 5, 6, 11, 12, 17, and 23. The inspectors observed radiation protection controls and monitoring.

The inspectors reviewed training certificates, qualification and medical records for crane operators and cask loading operators. The inspectors reviewed the required records and data contained in the working copy of the procedure. The inspectors reviewed TN-32-35 Independent Spent Fuel Storage Installation (ISFSI) Fuel Assembly and Insert Component Certification and Cask Loading Map to verify that the loaded assemblies met the Technical Specification in Table 2-5, TN-32 Cask Operating Limits, which contained the description and limits of the spent fuel assemblies to be placed in the canister, such as initial fuel enrichment, fuel burnup, decay heat, time discharged, fuel assembly design, time since discharged for burnable poison rods (BPRAs), and uranium content.

The inspectors reviewed Plant Issue Resolution S-2003-3444, initiated by the licensee for the resolution and evaluation of corrosion from water inside the cask overpack bolt holes, which remains open pending assistance from Transnuclear, Inc.

The inspectors toured the cask storage pad area and examined structural conditions of casks and concrete pads. The inspectors also observed that the licensee personnel performed the periodic inspection for the condition of the stored casks and concrete pads.

b. Findings

No findings of significance were identified.

.2 Review of 10 CFR 72.48 Evaluations (60857)

a. Inspection Scope

The inspectors reviewed Safety Review/Regulatory Screen and Regulatory Evaluation (Safety Evaluation) 02-0011, involving Non-confirming Report (NCR) 909, gaps manufactured between center basket rails were not uniform and different from drawing requirements, to determine if the requirements of 10 CFR 72.48 were met. The evaluation was to evaluate a change to the Independent Spent Fuel Storage Installation (ISFSI) Safety Analysis Report (SAR), which includes adding structural analysis to reflect the full range of possible gap sizes between center basket rails in the TN-32 casks and also includes possible gap changes during accidents.

b. Findings

No findings of significance were identified.

.3 Reactor Pressure Vessel Head (RPVH) Replacement Activities (71007)

a. Inspection Scope

The inspectors observed/reviewed the activities detailed below for the replacement RPVH to verify compliance with applicable Codes (ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition and Section III 1995 Edition, 1996 Addenda) as defined in Design Change Package (DCP) 02-054, Reactor Vessel Head & Associated Components Replacement / Surry / 2.

Control Rod Drive Mechanism (CRDM) Seal Welds

Relative to the CRDM seal welds (made by PCI Energy Services on site), the inspectors reviewed weld records and visually inspected completed welds B32-35-48, B32-46-67, B32-21-34, B32-15-28, B32-19-32, B32-22-35, B32-19-32, B32-14-27, B32-37-58, B32-34-47, B32-32-45, B32-48-69, and B32-27-40. The records reviewed included welder qualification records, Quality Control (QC) inspector and nondestructive examination (NDE) examiner qualification records, liquid penetrant (PT) examination material test reports, and welding material certified material test reports for ER 316/316L heats 316010 and 370665.

RPVH and CRDM Fabrication Welds

The inspectors visually inspected the following RPVH fabricator (Mitsubishi Heavy Industries LTD.) shop welds:

- Nozzle to Head J-Groove Welds WC-W109-49A, WC-W109-44A, WC-W109-47A, WC-W109-56A, WC-W109-60A, WC-W109-59A, WC-W109-68A, and WC-W109-34A
- Head Adapter Flange Welds WC-W110-47A, WC-W110-27A, WC-W110-64A, WC-W110-59A, WC-W110-31A, WC-W110-46A, WC-W110-65A, and WC-W110-48A

The inspectors reviewed completed weld fabrication records, including NDE records (PT and radiographic examination (RT), as applicable), NDE personnel qualification records, and welder qualification records for the following welds:

- Rod Travel Housing to Latch Housing Welds WC-D009-26A, WC-D009-28A, and WC-D009-63A
- CRDM Nozzle to Head J-Groove Butter Welds WO-W107-18A, WO-W107-59A, and WO-W107-38A
- Head Adapter Flange Welds WC-W110-19A, WC-W110-45A, and WC-W110-68A
- CRDM Nozzle to Head J-Groove Welds WC-W109-12A, WC-W109-42A, WC-W109-59A

RPVH Receiving Inspection

The inspectors reviewed Receiving Inspection Reports (RIRs) 000 SSV-125S00 (CRDM Assemblies), and 000 SSV00147-S00 (RV Upgrade Package) 000 SSV00183-S01 (RV Head).

Preservice Inspection (PSI) and Baseline Inspections

Relative to PSI of replacement RPVH, the inspectors discussed with licensee personnel the completed inspections as well as planned inspections, which consisted of: (1) fabrication NDE inspections, which had been modified at the time of performance to meet both ASME Sections III and IX, for the Category BO welds, and (2) visual examination (VT) inspection of Category BE welds (J-Groove partial penetration welds) after installation of the head. As detailed above, a sample of the fabrication NDE records for Category BO welds (Rod Travel Housing to Latch Housing and Head Adapter Flange Welds) were reviewed.

The licensee discussed with the inspector the scope of baseline inspections of the CRDM nozzle and J-Groove weld area, which included: bare metal VT of the top of the head, ultrasonic examination (UT) of the nozzle volume from 2 inches above the J-Groove weld to the bottom of the nozzle, eddy current examination (ET) (surface examination) of the nozzle OD from the J-Groove weld to the bottom of the nozzle and the ID of the nozzle from the bottom to 2 inches above the J-Groove weld, surface examination (PT and ET) of the surface of the J-Groove welds (including ½ inch on both sides of the weld), and UT of the ID of the nozzle to CRDM adapter weld. The completed report for these inspections was being prepared by the contractor and was not yet available for review. However, the inspector reviewed completed records (Visual Inspection Data Sheets) for the bare head VT inspection and the completed PT reports for the J-Groove welds.

b. Findings

No findings of significance were identified.

.4 Review of 10 CFR 50.59 Evaluations for the Replacement RPVH (71007)

a. Inspection Scope

The inspectors reviewed the following RPVH replacement DCP, Engineering Transmittals (ETs) and associated 10 CFR 50.59 evaluation:

- DCP 02-054, Reactor Vessel Head and Associated Components Replacement / Surry, Unit 2
- ET-NPD-S-03-0203, Risk Release for CRDM Installation in Replacement Reactor Vessel Closure Head
- ET-NPD-S-03-0201, Risk Release for Installation of New Integrated RV Head Radiation Shield/CRDM Lower Cooling Shroud

The DCP and ETs were reviewed to verify that changes between the original RPVH and the replacement RPVH, and modifications resulting from installation of the replacement RPVH were properly evaluated in accordance with 10 CFR 50.59.

b. Findings

No findings of significance were identified.

.5 (Closed) URI 05000280, 281/2003007-06: Emergency Diesel Generator No. 3 Bus-Tie Breakers Control Circuit Design Deficiency

Introduction. A Green NCV was identified for a violation of 10 CFR 50, Appendix B, Criterion III, Design Control. EDG No. 3 could be overloaded following a concurrent loss-of-offsite power (LOOP) on Units 1 and 2. The overload could occur due to this generator being shared between the two units and an inspector identified design deficiency in the EDG output breakers' control circuits. No actual overload event occurred. As described in Inspection Report 50-280, 281/03-07, the licensee resolved the problem through a modification. The URI was opened pending determination of the risk significance of the as found condition through the Significance Determination Process (SDP).

Description. The licensee performed an analysis which concluded that EDG No. 3 would remain in a recoverable state after being subjected to the automatic loading associated with simultaneous closure of output breakers to the 1J and 2J buses following a dual unit LOOP. Part of this analysis consisted of refining the original load estimate (discussed in Inspection Report 50-280, 281/03-07) associated with the scenario of interest. The new analysis showed that the sum of the automatically connected loads is less than the 168-hour rating of the EDG. It also determined that the initial load block and subsequent automatic application of 400 kW at three minutes could be accepted by the EDG. The new analysis also showed that the situation beyond the three minute point was that EDG No. 3 could not accept the load of the component cooling water pump without exceeding the 30-minute rating. Abnormal procedures would direct the start of the component cooling pump. The licensee stated they believed the operators could recognize the situation with regard to EDG No. 3 loading and take appropriate action before starting the component cooling pump.

Analysis. The inspectors made a line-by-line review of the loading calculation, reviewed the ratings of the EDG, and reviewed the ability of the EDG to accept the large load block. The inspectors agreed that the automatically connected load was within the capacity and capability of the EDG. Therefore, to cause a loss of function required operators to ignore cautions in the Abnormal Operating Procedures associated with ensuring that EDG No. 3 was only providing loads to one safety bus. A regional Senior Reactor Analyst performed a Phase III evaluation under the Significance Determination Process of the possibility of operators failing to ignore the caution statements and cause a failure of the EDG. The evaluation determined that the performance deficiency was of very low significance (Green). Contributing to the very low significance was that the performance deficiency was only applicable to Loss of Offsite Power initiators, the need for other equipment of a similar nature (EDG Nos. 1 or 2 and the Station Blackout Diesel

Generator) to fail and the remote possibility (3.3E-2) that operators would ignore written procedural direction.

Enforcement. NRC Inspection Report 50-280, 281/03-07 gives a detailed statement as to requirements related to this issue. The control circuit problem was an inadequate design and represents a violation of 10 CFR 50, Appendix B, Criterion III, Design Control. Because the problem was of very low safety significance and has been entered into the licensee's corrective action program as PI-S-2003-0633, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: 05000280, 281/2003004-01, Emergency Diesel Generator No. 3 Bus-Tie Breaker Control Circuit Design Deficiency.

4OA6 Meetings, Including Exit

On October 9, 2003, the resident inspectors presented the inspection results to Mr. Sowers and other members of his staff who acknowledge the findings.

The inspectors confirmed that proprietary information was not provided or examined during the inspection.

SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Licensee

R. Allen, Manager, Outage and Planning
R. Blount, Site Vice President
B. Foster, Director, Nuclear Station Safety and Licensing
B. Garber, Acting Supervisor, Licensing
T. Huber, Manager, Engineering
D. Llewellyn, Manager, Training
R. MacManus, Manager, Nuclear Oversight
T. Sowers, Director, Nuclear Station Operations and Maintenance
B. Stanley, Manager, Maintenance
T. Steed, Manager, Radiological Protection
J. Swientoniewski, Manager, Operations

NRC

K. Landis, Chief, Branch 5, Division of Reactor Projects, Region II

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000280, 281/2003004-01	NCV	Emergency Diesel Generator No. 3 Bus-Tie Breaker Control Circuit Design Deficiency
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Closed

05000280, 281/2003007-06	URI	Emergency Diesel Generator No. 3 Bus-Tie Breakers Control Circuit Design Deficiency
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LIST OF DOCUMENTS REVIEWED

Section 1R02 - Evaluations

- DCP 88-006 S/G Upper Support Elimination
 RE 01-005I ISFSI Tech Spec Change Request # TS-18
 RE 01-048 Special test for Aux. Bldg Exhaust Filter System Fans
 RE 02-007 New analysis to evaluate hydrogen concentration in containment following a LOCA.
 RE 02-008 Evaluation to temporarily extend the 72-hour time frame allowed for placing a main feedwater regulating valve (MFRV) on its jack for troubleshooting and maintenance.
 RE 03-003 New design limit for use in evaluating the corrosion of Westinghouse Zirconium Alloy fuel assembly structural components.

Section 1R02 - Screened Out Items

- DCP 00-035 Charging Pump SW Pump Suction Gage Installations
 DCP 01-029 SD Level Transmitter 38-02-SD-LT-21
 DCP 01-070 Replacement of the Control Room Chiller 480V Molded Case Circuit Breakers
 DCP 02-014 Elimination of Rigid Valve Operator Support for 2-RH-FCV-2605
 DCP 02-019 Pressurizer PORV Backup Air System Pressure Regulator Setpoint Change U2
 DCP 98-005 SW MOV Replacement
 DCP 98-050 SW Emergency Service Water Pump Modification
 DCP 02-016 Trip Unit Replacement for ACC 480V MCC OM-1 Breaker 04M1-3/S
 DCP 02-031 PZR PORV Backup Air System Pressure Regulator Setpoint Change U1/2
 DCP 02-065 Component Cooling Return from RHR Setpoint Change
 DCP 03-049 Setpoint Change for Feedwater Auxiliary Lube Oil Pump Pressure Switches
 RS 01-043 Temporary Mod to Monitor & Record time needed to pressurize EDG gear driven pump's discharge headers
 RS 01-047 Miscellaneous NSS Protection & Control Setpoint & Scaling Changes.
 RS 01-049 Feedwater Regulating Valve Modification.

Section 40A5.1 Observation of Dry Cask Loading (60855)

- 0-OP-FH-062, TN-32 Cask Loading and Handling, Revision 019
 VPAP-0810, Crane and Hoist Program, Revision 010
 0-PT-58.4, Operations Periodic Test for ISFSI Cask Visual Inspection, Revision 000
 Crane Operator and Quality Control Inspector Training Certificates, Qualification and Medical Records
 Surry ISFSI Fuel Assembly/Insert Component Certification TN-32-35, Revision 0
 Surry ISFSI Cask Loading Map TN-32-35, Revision 0
 Dominion Generation Chemistry Logs for Surry Spent Fuel Pool (For Boron concentration tests)
 Work Order 00483586 for spent fuel crane inspection and test
 New Work Orders 00494832, 00494833, 00494834, 00494835, 00494842, and 00494843 for the painting on the trunnions of the casks stored on the concrete pad.
 Plant Issue Resolution S-2003-3444-R1 for Overpack Bolt Holes Corrosion Resolution
 Periodic Surveillance Scheduling Sheet for Procedure 0-PT-58.4, Revision 000

Section 40A4.2 Review of 10 CFR 72.48 Evaluations (60857)

VPAP-3001, Safety and Regulatory Reviews, Revision 9
Regulatory Evaluation 02-001I, 72.48 Safety Review/Regulatory Screen for gap sizes between center basket rails

Section 40A4.3 Reactor Pressure Vessel Head (RPVH) Replacement Activities (71007)

Draft DCP N0. 02-054, Reactor Vessel Head & Associated Components Replacement / Surry / Unit 2

ET-NPD-S-03-0203, Risk Release for CRDM Installation in Replacement Reactor Vessel Closure Head

ET-NPD-S-03-0201, Risk Release for Installation of New Integrated RV Head Radiation Shield/CRDM Lower Cooling Shroud

Framatome ANP Baseline Reactor Vessel Head Nozzle Penetration Remote Visual Inspection Plan for Surry Unit 2

Framatome Visual Inspection Data Sheets completed 8/24/2003

Framatome PT Inspection Reports for J-Groove Welds completed 8/27/2003 - including photographs of PT inspection results for nozzles 13, 20,21,29, and 36

Framatome PT materials certifications records

Receiving Inspection Reports (RIRs) 000 SSV-125S00 (CRDM Assemblies), and 000 SSV00147-S00 (RV Upgrade Package) 000 SSV00183-S01 (RV Head)

PCI Energy Services Weld Data Sheets for CRDM Seal Welds B32-35-48, B32-46-67, B32-21-34, B32-15-28, B32-19-32, B32-22-35, B32-19-32, B32-14-27, B32-37-58, B32-34-47, B32-32-45, B32-48-69, and B32-27-40

PCI Energy Services Welder Qualification Records For One Welder

PCI Energy Services Qualification Records for One Quality Control (QC) Inspector and NDE Examiner

PCI Energy Services PT Examination Material Certification Reports

PCI Energy Services Welding Material Certified Material Test Reports for ER 316/316L Heats 316010 and 370665

A Sample of Mitsubishi Heavy Industries LTD Shop Weld Records, Including Weld Data Sheets, Associated Welder Qualification Records, NDE Records, and NDE Personnel Qualification Records