UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

April 4, 2003

Carolina Power & Light Company
ATTN: Mr. John W. Moyer
Vice President
H. B. Robinson Steam Electric Plant, Unit 2
3851 West Entrance Road
Hartsville, SC 29550

SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT - NRC INSPECTION REPORT NO. 50-261/03-02

Dear Mr. Moyer:

On March 14, 2003, the NRC completed an inspection at your Robinson facility. The enclosed report documents the inspection findings which were discussed on March 14, 2003, with you and other members of your staff.

The inspection was an examination of 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.

Based on the results of this inspection, no findings of significance were identified.

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 Publically Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Charles R. Ogle, Chief
Engineering Branch 1
Division of Reactor Safety

Docket Nos.: 50-261
License Nos.: DPR-23

Enclosure: Inspection Report No. 50-261/03-02
w/Attachment Supplemental Information

cc w/encl: (See page 2)

cc w/encl:
Chris L. Burton
Director, Site Operations
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant
Electronic Mail Distribution

T. P. Cleary
Plant General Manager
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant
Electronic Mail Distribution

Terry C. Morton, Manager
Performance Evaluation and
Regulatory Affairs CPB 9
Electronic Mail Distribution

C. T. Baucom, Supervisor
Licensing/Regulatory Programs
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant
Electronic Mail Distribution

B. L. Fletcher III, Manager
Regulatory Affairs
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant
Electronic Mail Distribution

Henry J. Porter, Director
Div. of Radioactive Waste Mgmt.
Dept. of Health and Environmental
Control
Electronic Mail Distribution

R. Mike Gandy
Division of Radioactive Waste Mgmt.
S. C. Department of Health and
Environmental Control
Electronic Mail Distribution

Beverly Hall, Acting Director
Division of Radiation Protection
N. C. Department of Environment,
Health and Natural Resources
Electronic Mail Distribution

(cc w/encl cont'd - See page 3)

(cc w/encl cont'd)
William D. Johnson
Vice President & Corporate Secretary
Carolina Power & Light Company
Electronic Mail Distribution

John H. O'Neill, Jr.
Shaw, Pittman, Potts & Trowbridge
2300 N. Street, NW
Washington, DC 20037-1128

Peggy Force
Assistant Attorney General
State of North Carolina
Electronic Mail Distribution

Chairman of the North Carolina
Utilities Commission
c/o Sam Watson, Staff Attorney
Electronic Mail Distribution

Robert P. Gruber
Executive Director
Public Staff - NCUC
4326 Mail Service Center
Raleigh, NC 27699-4326

Public Service Commission
State of South Carolina
P. O. Box 11649
Columbia, SC 29211

Distribution w/encl:
C. Patel, NRR
L. Slack, RII EICS
RIDSNRRDIPMLIPB
PUBLIC

OFFICE	RII:DRS	RII:DRP	RII:DRS	RII:DRS	RII:DRS	RII:DRS	RII:DRP
SIGNATURE	**RA**	**RA**	**RA**	**RA**	**RA**	**RA**	**RA**
NAME	MERRIWEATHER	HAGAR	MAYMI	MAXEY	O'DONOHUE	SCHIN	FREDRICKSON
DATE	4/3/2003	4/2/2003	4/3/2003	4/3/2003	4/3/2003	4/2/2003	4/4/2003
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
PUBLIC DOCUMENT	YES NO						

OFFICIAL RECORD COPY DOCUMENT NAME: C:\ORPCheckout\FileNET\ML030970701.wpd

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	50-261
License No.:	DPR-23
Report No.:	50-261/03-02
Licensee:	Carolina Power & Light Company
Facility:	H. B. Robinson Steam Electric Plant, Unit 2
Location:	3581 West Entrance Road Hartsville, SC 29550
Dates:	February 24 - 28, 2003, and March 10 - 14, 2003
Lead Inspector	N. Merriweather, Senior Reactor Inspector
Team:	B. Hagar, Resident Inspector, Shearon Harris M. Maymi, Reactor Inspector K. Maxey, Reactor Inspector K. O'Donohue, Senior Operations Engineer R. Schin, Senior Reactor Inspector
Accompanying Personnel:	C. Ogle, Chief, Engineering Branch A. Vargas, Safety Intern
Approved by:	Charles R. Ogle, Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000261/2003-02; Carolina Power & Light; on 2/24 - 28/03 and 3/10 - 14/03;
H. B. Robinson Steam Electric Plant, Unit 2; Safety System Design and Performance Capability Inspection.

This inspection and was conducted by a team of regional and resident inspectors. 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.

Report Details

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems

1R21 Safety System Design and Performance Capability (71111.21)

This inspection focused on the licensee's steam generator tube rupture (SGTR) event recognition capabilities, abnormal and emergency operating procedures, long term suction sources for auxiliary feedwater (AFW) pumps, and other related SGTR mitigation equipment. This inspection also covered supporting equipment, equipment which provides power to those components, and the associated instrumentation and controls.

.1 System Needs

.11 Process Medium

a. Inspection Scope

Monitoring for Steam Generator (SG) Tube Leakage

The team reviewed plant procedures to verify that controls were in place for monitoring SG tube leakage and for plant shutdown prior to exceeding an established limit on SG tube leakage. During a simulator scenario of a steam generator tube leak and rupture event, the team observed the relevant simulator control room indications and alarms to verify that they provided appropriate and non-ambiguous information to the operators as to which SG had a tube leak or rupture.

The team reviewed setpoint calculations of those radiation monitors described below to verify that surveillance and annunciator response procedures were adequate for monitoring steam generator tube rupture leakage. The maintenance history of the radiation monitors was also reviewed to determine the current performance capability of the radiation detection equipment.

- Condenser Air Ejector Radiation Monitor: R-15
- Steam Generator Blowdown Radiation Monitors: R-19A, B, C
- Steam Line Radiation Monitors: R-31A, B, C
- Low Level Steam Line Radiation Monitors: R-24A, B, C

Secondary System Heat Removal

The team reviewed design basis documents, the Updated Final Safety Analysis Report (UFSAR), applicable Technical Specifications requirements, condensate storage tank (CST) drawings, system flow diagrams, auxiliary feedwater (AFW) pump vendor curves, service water and deep well pump systems pressures, and applicable net positive suction head (NPSH) calculations to verify that sufficient water volume and NPSH were available for the AFW pumps when taking suction from either the CST, deep well pumps, or service water system.

Also, the team reviewed emergency operating procedures (EOPs), abnormal operating procedures (AOPs), and normal operating procedures (OPs) that could be used during an SGTR event, walked them down, and discussed them with procedure writers and operators to verify that they included adequate instructions for providing a long term suction source for the auxiliary feedwater (AFW) pumps from service water, the deepwell pumps, or fire water, as well as makeup capability to the refueling water storage tank (RWST). The procedures were also reviewed to verify that they included adequate instructions for supplying fire water to cool the motor driven AFW pumps and for supplying fire water directly to the SGs. The team observed pre-staged tools, fittings, and hoses for providing alternate long term suction sources for the AFW pumps to verify that they were appropriately stored and labeled.

In addition, the team reviewed condition reports, testing, and internal inspection reports on the valves and piping between the service water and deep well pump systems and the AFW pumps suction to verify availability and functionality of the piping.

To verify that the water supply from AFW pumps will be available and unimpeded during accident/event conditions, the team reviewed the maintenance history of:

- the discharge valves downstream of the steam-driven AFW pump and both motor-driven AFW pumps,
- the steam supply valves to the steam-driven AFW pump turbine,
- the steam-driven auxiliary feedwater (SDAFW) pump, and
- both motor-driven auxiliary feedwater (MDAFW) pumps.

The team reviewed:

- each component's maintenance history by reviewing selected corrective-maintenance and preventive-maintenance work orders and trends of component performance data to verify that unexpected degradation had not been found, and that performance problems had not reappeared; and
- each component's preventive-maintenance schedule, to verify that the schedule was based either on vendor recommendations or an appropriate industry preventive maintenance model.

In addition, for those components which had experienced functional failures during the previous two years, the team reviewed the licensee's response to those failures, to verify that the licensee had adequately addressed the cause(s) of those failures.

RCS Makeup Capability

The inspectors reviewed the maintenance history of safety injection pumps A, B, and C, and charging pumps A, B, and C, to verify that flow from those pumps will be available and unimpeded during accident/event conditions. Also, the maintenance history on the

charging pump motors, AFW pump motors, and the deep-well pump motors was reviewed to determine their current performance capability.

Steam Generator Isolation

The inspectors reviewed the maintenance history of the SG power-operated relief valves, the SG safety relief valves, the SG blowdown isolation valves, and the main steam isolation valves and associated bypass valves, to verify that those valves were being maintained such that they would be capable of isolating an affected steam generator following a steam generator tube rupture.

The inspectors reviewed records from the two most-recent completions of procedure EST-028, Main Steam Safety Valve Testing, to verify that the SG safety relief valve setpoints were set at the appropriate values.

The specific valves inspected and the specific documents reviewed are identified in the Attachment.

b. Findings

No findings of significance were identified.

.12 Energy Sources

a. Inspection Scope

The team reviewed design basis documents, drawings, calculations, and procedures to verify that adequate power would be available for the motors and radiation monitors listed below.

- AFW Pump Motors, A and B
- Safety Injection Pump Motors, A, B, and C
- Charging Pump Motors, A, B, and C
- Radiation Monitors, R-15, R-19, R-31, and R-24

In addition, the team reviewed setpoint calculations and calibration data records to verify that adequate overcurrent protection was provided for the AFW and safety injection (SI) pump motors. Also, the team reviewed Calculation RNP-E-6.018, AC and DC Circuit Loop Analysis, to verify that the 125 V dc control power circuits for the pressurizer power operated relief valves (PCV-455C, PCV-456) and main steam isolation valves (V1-3A,3B,3C) were designed to operate within the minimum and maximum operating voltages specified for the equipment.

b. Findings

No findings of significance were identified.

.13 Instrumentation and Controls

a. Inspection Scope

The team reviewed surveillance and calibration records of SG narrow range level (LT-474, 484, 494), refueling water storage tank level (LT-969, 948), and AFW flow instruments to verify that appropriate setpoints had been included.

The team reviewed electrical control schematics of the main feedwater system, AFW system, pressurizer power operated relief valves (PORVs), and steam generator PORVs to verify that the control systems were in accordance with their design bases and would be functional and provide desired control during accident/event conditions.

The specific documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.14 Heat Removal

a. Inspection Scope

The team reviewed corrective maintenance work orders as well as testing, and inspection records of the component cooling water (CCW) system valves (i.e., CC-749A & B) that provide cooling to the residual heat removal (RHR) heat exchanger to verify that these valves were being maintained and monitored for deficiencies.

The team also reviewed steam dump valve surveillance testing and related condition reports to verify that the functionality of these valves was being maintained and that adverse trends were being monitored.

b. Findings

No findings of significance were identified.

.2 System Condition and Capability

.21 Installed Configuration

a. Inspection Scope

The team walked down the structures, systems, and components (SSCs) identified in the Attachment, to verify that:

- the configuration of each component in its system was consistent with the corresponding piping and instrument diagram;

- equipment and instrumentation elevations will support the design function;

- sloping of piping and instrument tubing appeared adequate;
- required equipment protection barriers (such as walls) and systems (such as freeze protection) were in place and intact;
- the location of the equipment makes it not susceptible to flooding, fire, high energy line breaks, and other environmental concerns;
- adequate physical separation and/or electrical isolation had been provided; and
- non-seismic SSCs in the vicinity of the equipment did not require evaluation for impact upon the component or its system.

b. Findings

No findings of significance were identified.

.22 Operations

a. Inspection Scope

The team reviewed EOPs, AOPs, and OPs that would be used in identification and mitigation of an SGTR event. This procedure review was done to verify that the procedures were consistent with the UFSAR description of an SGTR event and with the owners' group guideline procedures, any step deviations were justified and reasonable, and the procedures were written clearly and unambiguously. The team also reviewed relevant operator training lesson plans and job performance measures and discussed them with operators to verify that they were consistent with the procedures. In addition, the team discussed the EOPs with procedure writers and operators and observed a simulator scenario of an SGTR event to verify that the procedures and operator training were adequate to identify, isolate, and stop the leakage from the reactor coolant system (RCS) into the affected SG(s).

The team walked down selected portions of operating procedures to verify that human factors in the procedures and in the plant (e.g., clarity, lighting, noise, accessibility, labeling) were appropriate to support effective use of the procedures. The team reviewed system drawings and walked down all of the manual valves between the condensate storage tank (CST) and the AFW pumps to verify that the valves were all maintained locked open. The team also walked down the makeup portion of the chemical volume control system (CVCS) to verify all components were in good material condition and that the procedure steps directing make up to the RWST could be performed.

b. Findings

No findings of significance were identified.

.23 Design

a. Inspection Scope

Mechanical Design

The team reviewed the UFSAR, Technical Specifications (TS), design basis documents, operations training manuals, and system drawings for the AFW, main steam, CCW, primary and makeup water, CST and RCS systems to determine system function, design basis and requirements.

The team also reviewed NPSH calculations for the AFW pumps to verify that there was sufficient NPSH available, and to verify calculation assumptions were consistent with design criteria. Vendor manuals for the AFW and deep well pumps were also reviewed to verify design specifications were appropriately translated into design criteria documents, calculations, procedures, and tests.

The team also reviewed a design change document, which provided a pressure locking modification to the AFW pump discharge valves. This was reviewed to verify the system design function was maintained.

Electrical Design

The team reviewed instrument loop uncertainty calculations for the following monitoring instruments to verify that plant instrument calibration procedures had accurately incorporated set point values delineated in the calculations.

- Pressurizer Pressure (PT-455, 456, 457)
- Pressurizer Level (LT-459, 460, 461)
- Steam Generator Narrow Range (LT-474, 484, 494)
- Steam Generator Wide Range (LT-477, 487, 497)
- RCS Hot Leg Temperature (TE-413)
- RCS Wide Range Pressure (PT-402)

The team reviewed degraded voltage calculations for AFW pump motors and steam generator isolation valves to verify that the voltage at the terminals of motor starters complied with vendor recommended values.

b. Findings

No findings of significance were identified.

.24 Testing

a. Inspection Scope

For those specific mechanical components listed in the Attachment, the inspectors reviewed selected procedures used to inspect or test the components and to verify that those procedures were adequate to monitor the performance capability of the

components. The inspectors also reviewed records of recent completions of those procedures, to verify that those inspections and tests confirmed acceptable component performance. The specific procedures reviewed are listed in the Attachment.

Also, for those mechanical components within the scope of the licensee's inservice testing program, the team reviewed trends of component performance data recorded by that program, to verify that those trends do not reveal unanticipated degradations in component performance.

The team reviewed SDAFW and MDAFW pump component and comprehensive flow tests to verify acceptance criteria were consistent with design requirements and to confirm ongoing performance was being maintained. The tests were also reviewed to verify adverse conditions were identified and captured in the corrective action program.

The team reviewed pressurizer safety valves surveillance test results to verify that these valves were being maintained and performing in accordance with equipment specifications.

The team also reviewed logic testing procedures and test results for pressurizer PORVs and AFW automatic functions to verify that the tests validated integrated system operation and satisfied TS surveillance requirements.

b. Findings

No findings of significance were identified.

.3 Inspect Selected Components

.31 Component Degradation/Maintenance

a. Inspection Scope

Mechanical Equipment

The team reviewed SDAFW pump suction strainer inspection and maintenance records, AFW pump re-circulation line orifice internal inspection records, re-circulation line orifice dimension drawings, and service water strainer size drawings to verify that these components were being maintained and monitored for clogging and degradation. The team also reviewed SDAFW pump steam admission strainer and traps maintenance completed work orders to verify that these were also being maintained and monitored for degradation.

The team reviewed the completed maintenance work order records of the CST internals and bladder to verify that the CST components were being satisfactorily maintained.

The team reviewed the maintenance history of the instrument air system, to verify that proper air quality was being maintained, and that compressed air to operate air-operated valves will be available and unimpeded during accident/event conditions.

In addition, the team reviewed pressurizer auxiliary spray valve (CVC-311) system flow diagrams, and related corrective maintenance work orders to verify that the valve was being monitored for deficiencies.

During the walkdown of the components identified in the Attachment, the team verified that the equipment did not show indications of degradation. In addition, during the review of action requests related to each component, the team verified that those action requests did not identify unexpected degradation as the cause of any component performance problems.

The team reviewed procedure MNT-NGGC-0007, Foreign Material Exclusion Program, and discussed implementation of that procedure for work on feedwater nozzles and in the steam generators, to verify that the licensee's foreign-material exclusion program will reduce the likelihood that foreign materials that could initiate a steam generator tube rupture are not introduced into the flow stream.

Electrical Equipment

The team reviewed maintenance history records of pressurizer PORVs and CST level transmitters to verify that potential degradation was monitored or prevented and that component replacement was consistent with equipment qualification life.

The team reviewed environmental qualification records of pressurizer PORVs and pressurizer level instrumentation to verify that equipment qualification was suitable for the environment expected under all conditions.

The team performed a walkdown of CST and RWST level instrumentation to verify that equipment had adequate freeze protection.

b. Findings

No findings of significance were identified.

.32 Operating Experience

a. Inspection Scope

The team reviewed the licensee's dispositions of applicable operating experience reports to verify that applicable insights from those reports had been applied to the appropriate components. The specific operating experience reports reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.4 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed AFW pump and steam dump valves related problem event reports to verify design problems were identified and entered into the corrective action program. This included problem event reports related to the SDAFW pump impeller change and spiking of MDAFW pump discharge flow instrument.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA6 Meetings, Including Exit

On March 14, 2003, the team held an exit meeting with Mr. John Moyer and other members of his staff, where the results of the inspection were discussed. Proprietary information is not included in this inspection report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

T. Bardauskas, Maintenance Rule Coordinator
R. Barnett, Superintendent - Systems Engineering
C. Baucom, Licensing Supervisor
G. Capuccio, Service Water System Engineer
C. Church, Engineering Manager
B. Clark, Training Manager
T. Cleary, Plant General Manager
M. Clouse, Inservice Testing Program Coordinator
J. Davis, System Engineer
W. Farmer, Engineering Superintendent
J. Goshen, Licensing Engineer
E. Harris, AFW System Engineer
J. Hendrickson, System Engineer
R. Howell, Regulatory Support Supervisor
J. Little, System Engineer
D. Markle, System Engineer
J. Moyer, Vice President, Robinson Nuclear Plant
M. Olinger, Primary & Makeup Water System Engineer
L. Sanders, Reactor Operator
V. Smith, Senior Nuclear Procedures Writer
S. Wheeler, Corrective Action Program Coordinator
J. Williamson, System Engineer
M. Vaught, System Engineer

NRC Personnel

B. Desai, Senior Resident Inspector
D. Jones, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None.

LIST OF COMPONENTS REVIEWED

SG Power-Operated Relief Valves: RV1-1, -2, -3
Main Steam Line Isolation Valves: MS-V1-3A,-3B,-3C
Main Steam Line Isolation Bypass Valves: MS-353A, -B, -C
SG safety relief valves: SV1-1A, -2A, -3A,-4A,-1B, -2B, -3B, -4B, -1C, -2C, -3C, -4C
MFW regulating/isolation valves: FCV-478, -488, -498
MFW regulating/isolation valve bypass valves FCV-479, -489, -499
SG blowdown valves: FCV-1930A, -1930B, -1931A, -1931B, -1932A, -1932B
MD AFW discharge valves: V2-16A, -B, -C
Steam Dump valves: PRV-1324A1, -A2, -B1, -B2, -B3
Steam Driven AFW turbine steam supply valves, V1-8A, -B, -C
Steam Driven AFW Discharge Valves: V2-14A, -B, -C
Motor-driven AFW Pumps: A, B
Steam-driven AFW Pump
Charging pumps
Deep well pumps
Condensate storage tank
Conderser Air Ejector Radiation Monitor: R-15
Steam Generator Blowdown Radiation Monitors: R-19A,-B, -C
Steam Line Radiation Monitors: R-31A, -B, -C
Low Level Steam Line Radiation Monitor: R-24A, -B, -C
CST Level Instrumentation
RWST level Instrumentation

Attachment

LIST OF DOCUMENTS REVIEWED

Procedures

HPP-104, Verification and Operation of Breathing Air Supplies, Rev. 18
MNT-NGGC-0007, Foreign Material Exclusion Program, Rev. 2
AOP-005, Radiation Monitoring System, Rev. 21
AOP-35, SG Tube Leak, Rev. 14
EOP PATH-1 (reactor trip or safety injection), Rev. 17
EOP PATH-2 (SG tube rupture), Rev. 16
EPP-1, Loss of All AC Power, Attachment 1, Local Control of SG Level and Pressure, Rev. 31
EPP-1, Loss of All AC Power, Attachment 3, CST Emergency Fill From the Fire System, Rev. 31
EPP-11, Faulted Steam Generator Isolation, Rev. 4
EPP-17, SGTR With Loss Of Reactor Coolant: Subcooled Recovery, Rev. 13
EPP-18, SGTR With Loss Of Reactor Coolant: Saturated Recovery, Rev. 13
EPP-12, Post-SGTR Cooldown Using Backfill, Rev. 12
EPP-13, Post-SGTR Cooldown Using Blowdown, Rev. 12
EPP-14, Post-SGTR Cooldown Using Steam Dump, Rev. 10
EPP-Foldouts, Rev. 23
EPP-Supplements, Supplement G - Steam Generator Isolation, Rev. 28
EPP Supplements, Supplement L - Safeguards Auto Action Verification, Rev. 28
FRP-H.1, Response To Loss Of Secondary Heat Sink, Rev. 18
CP-014, Primary-to-Secondary Leak Rate Calculation, Rev.11
OP-301-1, Chemical And Volume Control System (Infrequent Operation), Rev. 22
OP-301, Chemical And Volume Control System (CVCS), Rev. 75
OP-504, Condenser Air Removal, Rev. 24
OP-920, Radiation Monitoring System, Rev. 28
OP-402, Auxiliary Feedwater System, Section 8.4.1, Using Service Water As Backup Supply to Auxiliary Feedwater Pumps, Rev. 56
OP-402, Auxiliary Feedwater System, Section 8.4.2, Using Deepwell Pumps As Backup Supply to Auxiliary Feedwater Pumps, Rev. 56
SP-867, Metal Impact Monitoring System (MIMS) Signal Conditioner Calibration, Rev. 9
SP-868, Digital Metal Impact Monitoring System (MIMS) Test Procedure, Rev. 10
SP-870, Metal Impact Monitoring System (MIMS) In-Containment Installation Procedure, Rev. 9
SP-871, Metal Impact Monitoring System MIMS) Baseline Recording Using Calibrated Hammers, Rev. 9
PM-462, LPMS Alarm and Background Test, Rev. 0
OST-013, Weekly Checks and Operations (Weekly), Rev. 58
OP-007, Loose Parts Monitoring System, Rev. 15
EST-147, Reactor Vessel Level Instrumentation System (RVLIS) Engineering Surveillance Test, Rev. 5
TMM-026, List of Regulatory Guide 1.97 Components, Rev. 18
LP-007, Reactor Coolant Wide Range Temperature Indication Hot Leg Channels 413, 423, and 433 Loop Calibration Procedure, Rev. 16
LP-016, Pressurizer Level Channel 459, Loop Calibration Procedure, Rev. 16
LP-022, Pressurizer Pressure Protection Channels 455, 456, 457 Loop Calibration Procedure, Rev. 8

LP-024, Steam Generator #1 Wide Range Level Channel 477, 487, 497 Loop Calibration Procedure, Rev. 10
LP-030, Steam Generator #1 Narrow Range Level Channel 474 Loop Calibration Procedure, Rev. 11
MST-201, 4kv Undervoltage Test-Auto Start of Steam Driven Auxiliary Feedwater System, Rev. 12
MST-202, 4kv Main Feedwater Breakers Open-Auto Start of Motor Driven Auxiliary Feedwater System, Rev. 10
MST-930, Auxiliary Feedwater Automatic Initiation Steam Generator Low-Low Level, Rev. 5
OST-202, Steam Driven Auxiliary Feedwater system Component Test, Rev. 56
PM-479, Preventive Maintenance Procedure, Rev. 1
PM-204, Calibration of Auxiliary Feedwater Time Delay Relays, Rev. 5

Drawings

A-190301, RVLIS Schematic Sheet 511A, Rev. 3
A-190301, RVLIS Schematic Sheet 511B, Rev. 4
A-190301, RVLIS Schematic Sheet 511C, Rev. 1
A-190301, Refueling Water Storage Tank Level Sheet 948, Rev. 2
A-190301, Condensate Storage Tank Level Sheet 1453, Rev. 0
B-190628, Pressurizer Relief Valve PCV-455C Wiring Diagram Sheet 120A, Rev. 18
B-190628, Pressurizer Relief Valve PCV-456 Wiring Diagram Sheet 119, Rev. 24
B-190628, Primary Water and Condensate Tanks Level Control Wiring Diagram Sheet 601, Rev. 13
B-190628, Control Wiring Diagram Condensate Tank Level LT-1454B Sheet 601A, Rev. 8
B-190628, Steam generator Blowdown Sampling Valves Control Wiring Diagram Sheet 628A, Rev. 6
B-190628, Steam Driven Feedwater Pump Control Wiring Diagram Sheet 630A, Rev. 16
B-190628, Steam Driven Feedwater Pump Control Wiring Diagram Sheet 630B, Rev. 13
B-190628, Steam Driven Feedwater Pump Control Wiring Diagram Sheet 630C, Rev. 21
B-190628, V1-88, SDAFW Pump Steam Isolation Control Wiring Diagram Sheet 632A, Rev. 12
B-190628, V2-14B, SDAFW Pump Discharge Control Wiring Diagram Sheet 648, Rev. 13
B-190628, Aux. Feedwater Pump B Control Wiring Diagram Sheet 655, Rev. 27
B-190628, V2-16A MDAFW Pump Header Discharge Control Wiring Diagram Sheet 662, Rev. 15
G-190197, Feedwater Condensate and Air Evacuation System Flow Diagram, Sheet 1 of 4, Rev. 73
G-190197, Feedwater Condensate and Air Evacuation System Flow Diagram, Sheet 4 of 4, Rev. 50
G-190626, Main & 4160 Volt One Line Diagram Sheet 1, Rev. 4
G-190626, 480 & 120/208 Volt One Line Diagram Sheet 2, Rev. 13
G-190626, 125V DC & 120V Vital AC One Line Diagram Sheet 3, Rev. 11
5379-3516, Hagan Wiring Diagram S.G. B Protection Ch. I and Wide Range Level, Rev. 19
5379-3517, Hagan Wiring Diagram S.G. C Protection Ch. I and Wide Range Level, Rev. 22
5379-3518, Hagan Wiring Diagram S.G. A Protection Ch. I and Wide Range Level, Rev. 22

Calculations

RNP-E-1.005, 120 VAC Instrument Bus Voltage Evaluation, Rev. 2
RNP-E-2.001, Overcurrent Protection for Auxiliary Feedwater Pumps A and B Motors, Rev. 3
RNP-E-2.006, Overcurrent Protection for Safety Injection Pumps A,B,C Motors, Rev. 3
RNP-E-6.018, AC and DC Circuit Loop Analysis, Rev. 0
RNP-E-8.032, Power Feeds to RMS consoles 1, 2, 3, Rev. 1
RNP-E-8.042, AC Motor Protection Evaluation Based on computer Program Motorguard 3.1, Rev. 2
RNP-I/INST-1015, Condensate Storage Tank Level Alarm Setpoints, Rev. 1
RNP-I/INST-1023, Refueling Water Storage Tank Uncertainty and Scaling Calculation, Rev. 3
RNP-I/INST-1038, Pressurizer Level Loop Uncertainty and Scaling Calculation (LT-459, 460, & 461), Rev. 2
RNP-I/INST-1042, Pressurizer Pressure Loop Uncertainty and Scaling Calculation (PT-455, 456, & 457), Rev. 2
RNP-I/INST-1054, RVLIS Instrument Channel Uncertainties, Rev. 2
RNP-I/INST-1064, RCS Hot Leg Temperature Instrument Uncertainty Calculation, Rev. 0
RNP-I/INST-1065, RCS Wide Range pressure Instrument Uncertainty Calculation, Rev. 0
RNP-I/INST-1066, RCS Subcooling Instrument Uncertainty Calculation, Rev. 0
RNP-I/INST-1070, Steam Generator Narrow Range Level Loop Uncertainty and Scaling Calculation, Rev. 2
RNP-I/INST-1071, Steam Generator Wide Range Level Loop Uncertainty and Scaling Calculation (LT-477, 487, & 497), Rev. 3
RNP-I/INST-1117, Miscellaneous EOP Setpoint Parameters, Rev. 0

Action Requests

10879, IVSW Reset Procedure Changes 9900278
26014, Knowledge Level of OPS Personnel for P/S Leakage
18118, Lessons Learned Evaluation Of Indian Point 2 S/G Tube Failure
21267, LCV-1530A regulated air supply line found separated at fitting
26237, Generic Letter 92-05, motor-operated valve periodic verification
27323, SI pump A thrust bearing oil samples have exhibited a dark color since the bearing was replaced
31177, Steam Line PORVs RV1-1 and RV1-3 failed to open under a trip signal
52027, Demonstrating that RNP is meeting its commitments to Generic Letter 88-14
52731, Inspection of the SDAFW pump impeller revealed degraded metal on only one of the four vanes
65220, Calibrated instrumentation on the south service water header is providing inconsistent results
67977, Inadequate thread engagement on all 8 bolts of the spectacle flange downstream of valve SI-897G
68240, Safety injection pump C black oil
71705, Valve vendor drawing discrepancies
73940, As-found testing found 1 of 3 main steam safety valves with a setpoint above the acceptance criteria

74421, Ten out of 18 relief valves failed testing during RFO-21
74662, PC-464B failed to open the steam dumps
77525, PRV-1324B-2 failed to open due to bad solenoid-operated valve
82961, The SDAFW pump was operating with high lube oil inlet and outlet temperatures
83885, [The plant] entered a red risk condition due to exceeding the allowed outage time on the SDAFW pump

Completed Surveillance Procedures, Preventive Maintenance (PM), and Test Records

OST-930, Control System Component Test for PCV-455C and PCV-456, completed 11/9/02
RST-001, Radiation Monitor Source Checks, Rev. 66, completed 1/29/03
EST-028, Main Steam Safety Valve Testing, completed 10/8/02 and 11/11/02
EST-077, Inservice Inspection Pressure Testing of Feedwater System, completed 8/6/01
PPP-007, Feedwater Leakage Test, completed 2/13/96 and 5/7/01
OST-163, Safety Injection Test and Emergency Diesel Generator Auto Start on Loss of Power and Safety Injection, completed 5/7/01 and 11/7/02
OST-702, Inservice Inspection Secondary Side Valve Test (Cold Shutdown (Mode 5 or Mode 6) Greater Than 48 Hours, Unless Previously Completed Within 90 Days),
OST-702-2, Secondary Side Inservice Valve Test for Main Feedwater, completed on 5/3/01 & 11/10/02
EMP-022, Gaseous Waste Release Permit-Continuous Release R-14C, completed 2/17/03
EMP-028, Process Monitor Setpoint Worksheet (R-15 Condenser Vacuum Pump Vent Monitor), completed 11/08/02
MMM-06, Appendix B-7, Auxiliary Feedwater Flow Channel A Calibration, completed 3/26/02
MMM-06, Appendix B-12, Auxiliary Feedwater Flow Channel B Calibration, completed 4/29/02
OST-930, Control System Component Test for PCV-455C and PCV-456, completed 11/9/02
PIC-005, Calibration Data for Steam Generator A Level, completed 10/19/02
RST-001, Radiation Monitor Source Checks, Rev. 66, completed 1/29/03
RST-009, Test Data for R-31A, B, C, completed 12/17/02
RST-017, Calibration Data for R-19A, B, C, completed 12/4/00
RST-029, Calibration Data for R-24A, B, C, Rev.1
RST-013, Calibration Data for R-15, dated 10/25/00 and 4/24/02

Completed Work Orders (WO)

WO 00053562, Steam Generator B Liquid Radiation Monitor R-19B reading low on RR-1, completed 11/07/00
WO 00065392, Calibrate the Condensate Storage Tank Level Instruments, completed 07/01/01
WO 00136753, Calibrate Auxiliary Feedwater Time Delay Relays, completed 10/17/02
WO 00136754, Calibrate Auxiliary Feedwater Time Delay Relays, completed 10/17/02
WO 00136755, Calibrate Auxiliary Feedwater Time Delay Relays, completed 10/17/02
WO 00143933, Calibrate the Condensate Storage Tank Level Instruments, completed 2/2/03
WO 00144710, RV1-3 Setpoint is Drifting, 5/12/01
WO 00178373, R-19B CPU Failure, completed 09/21/01
WO 00236316, Calibrate the RWST Level Instrument LT-969, completed 8/18/02

WO 00236317, Calibrate the Refueling Water Storage Tank Level Transmitter, completed 8/18/03
WO 00316036, Calibrate the RWST Level Instrument LT-969, completed 2/2/03
WO 00316037, Calibrate the Refueling Water Storage Tank Level Transmitter, completed 2/2/03
WO 00336498, Calibrate the Steam Driven Aux Feedwater Pump Discharge Pressure Switches, completed 01/07/03
WO 00345057, Calibrate the AFW A Pump Discharge Pressure Switches, completed 01/30/03
WO 00345058, Calibrate the AFW B Pump Discharge Pressure Switches, completed 12/12/02

Design Criteria

DBD/R87038/SD16, Electrical Power Distribution System, Rev. 1
DBD/R87038/SD19, Radiation Monitoring System, Rev. 0
DBD/R87038/SD26, Condensate system, Rev. 6
DBD/R87038/SD32, Auxiliary Feedwater System, Rev. 6
DBD/R87038/SD51, Reactor Vessel Level Instrumentation System, Rev. 2

EOP & AOP Basis Documents

AOP-35-BD, Basis Document, SG Tube Leak, Rev. 14
AOP-005-BD, Basis Document, Radiation Monitoring System, Rev. 21
AOP-016-BD, Basis Document, Loss Of RCS Inventory, Rev. 14
EPP-17-BD, EPP-17 Basis Documentation , Rev. 13
PATH-2-BD, PATH-2 Basis Document, Rev. 16

Job Performance Measures (JPMs)

JPM-IP-002, Shift Auxiliary Feedwater Pump Suction to Service Water, Rev. 12
JPM-IP-055, Using Deepwell Pumps as Backup Supply to Auxiliary Feedwater Pumps. Rev. 3
JPM-IP-072, Aligning Service Water to the SDAFW Pump Suction and Re-establishing AFW Flow IAW EPP-001, Attachment 1, Rev. 5
JPM-IP-126, SW Backup to MDAFW Pumps (FRP-H.1 Attachment 2), Rev. 0

Setpoint Documentation and Background Resources

RNP-I/INST-1101, RCS Temperature EOP Setpoint Parameters, Rev. 1
RNP-I/INST-1103, Steam Generator Level EOP Setpoint Parameters, Rev. 1
RNP-I/INST-1111,RWST Level EOP Setpoint Parameters, Rev. 0
RNP-I/INST-1037, Natural Circulation Cooldown Analysis, Rev. 0
RNP-I/INST-1065, RCS Wide Range Pressure Instrument Uncertainty Calculation, Rev. 0
RNP-I/INST-1070, Steam Generator Narrow Range Level Instrument Uncertainty Calculation, Rev. 2
ARG-3, Steam Generator Tube Leak, Rev. 0

UFSAR

Section 8.3, Onsite Power Systems
Section 9.3.1, Station and Instrument Air
Section 10.4.8, Auxiliary Feedwater System
Section 11.5, Process and Effluent Radiological Monitoring and Sampling Systems
Section 15, Accident Analysis
Section 15.6.3, Steam Generator Tube Rupture

Technical Manuals

727-908-35, Copes Vulcan Instruction Manual
728-821-11, Main Steam Trip Isolation Valve Assembly
728-012-44, Installation, Operating, and Maintenance Instructions for Crosby Style HC-HCA Safety Valves
728-800-08, Worthington WT Pumps Manual
727-907-44, Installation, Operating, and Maintenance Instructions for Copes Vulcan D-100 Steam Dump Valves
Steam-driven AFW pump curve from 728-653-30
Motor-driven AFW pump curve from 728-653-06

Operating Experience Reports

11891, All 3 AFW Pumps Declared Inoperable Due to the Potential to Plug Their Suction Strainers
11990, Main Feedwater Pump 1A Tripped During Performance of the Emergency Govenor Overspeed,
12078, Turbine-Driven AFW Pump Trip Following a Plant Trip
12082, Reactor Feed Pump Speed Transient Caused by Lug Corrosion
12163, Interference Between the Torque Switch Roller Arm Carrier and Actuator
12172, Beaver Valley Unit 2 Feedwater Regulating Valve Wall Erosion
12363, Multiple Main Steam Safety Valve Relief Tests Exceeded Required Tolerance Due to Disk to Nozzle Metallic Bonding
12672, Reduced Safety Valve Reseat Pressure Following Extended Relief
12875, Main Steam Isolation Valve Fails to Fully Close
12943, Insitu Testing of Three Main Steam Safety Valves with X750 Disk Material Installed Exceeds 3% Tech Spec Limit
12950, Safety Relief Valve Setpoints Changed Without an Evaluation of Blowdown Behavior
14040, Valve Plug, Stem, and Bonnet Lifted From Valve Body by System Pressure
15385, Thermal Overload Relay Heater Improperly Sized
Information Notice (IN) 02-01: Metalclad Switchgear Failures and Consequent Losses of Offsite Power
IN 02-10: Steam Generator Water Level Setpoint Uncertainties
IN 02-34: Failure of Safety-related Circuit Breaker External Auxiliary Switches

Miscellaneous

Work order 00053882, Recent oil analysis displays elevated moisture in the “A” SI pump
National Compressed Air Certifications dated 7/9/02 and 1/14/03
System Health Reports for the Chemical & Volume Control System, dated 7/18/02 and 12/31/02
Background Information For Westinghouse Owners Group Abnormal Response Guideline

Technical Specifications (TS)

TS Section 3.4, Reactor Coolant System

ACTION REQUESTS WRITTEN DURING THIS INSPECTION

85825, Admin error in AFW DBD Sections 0.6.7 & 4.1.4
87161, Identify all EOP locations of reverse acting valves
87576, SG PORV isolation improvements
87540, IST Program Guidance
87542, Review IST Program trending practice
88667, Instrument Calculation INST-1042 needs administrative correction

PROCEDURE REVISION REQUESTS WRITTEN DURING THIS INSPECTION

86116, EPP-1 needs a note giving location of fire hoses
87325, OP-402 caution note is confusing