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

July 25, 2005

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 NOS. 05000280/2005003 AND 05000281/2005003

Dear Mr. Christian:

On June 30, 2005, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Surry Power Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on July 6, 2005, with Mr. Jernigan 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 on the results of this inspection, the inspectors identified two issues of very low safety significance (Green). All of these issues were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they had been entered into your corrective action program, the NRC is treating these issues as non-cited violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny these non-cited violations you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Surry Power Station.

In accordance with 10 CFR 2.390 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
License Nos.: DPR-32, DPR-37

Enclosure: Integrated Inspection Report 5000280,281/2005003
w/Attachment: Supplemental Information

cc w/encl:
Chris L. Funderburk, Director
Nuclear Licensing and
Operations Support
Virginia Electric & Power Company
Electronic Mail Distribution

Donald E. Jernigan
Site Vice President
Surry Power Station
Virginia Electric & Power Company
Electronic Mail Distribution

Virginia State Corporation Commission
Division of Energy Regulation
P. O. Box 1197
Richmond, VA 23209

Lillian M. Cuoco, Esq.
Senior Counsel
Dominion Resources Services, Inc.
Electronic Mail Distribution

Attorney General
Supreme Court Building
900 East Main Street
Richmond, VA 23219

Distribution w/encl:
S. Monarque, NRR
C. Evans, (Part 72 Only)
L. Slack, RII EICS
D. Patrak (dwp1@nrc.gov)
RIDSNRRDIPMLIPB
PUBLIC

☐ X SISP REVIEW COMPLETE: Initials: _KDL ☐ SISP REVIEW PENDING*: Initials: _____ *Non-Public until the review is complete
☐ X PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE ☐ SENSITIVE ☐ X NON-SENSITIVE
ADAMS: ☐ Yes ACCESSION NUMBER:_____

OFFICE	RIIDRP	RIIDRP	RIIDRP	RIIDRS	RII/DRS	RII/DRP	RII/DRS
SIGNATURE	NXG	DCA	RPC1	RCC2	JDF	LXG1	HGJ1
NAME	NGarrett	DArnett	RCarrion	RChou	JFuller	LGarner	HGepford
DATE	7/25/2005	7/25/2005	7/25/2005	7/22/2005	7/25/2005	7/25/2005	7/25/2005
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICE	RII:DRS						
SIGNATURE	FNW						
NAME	FWright						
DATE	7/25/2005						
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: E:\Filenet\ML052070785.wpd

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-280, 50-281

License Nos.: DPR-32, DPR-37

Report Nos.: 05000280/2005003, 05000281/2005003

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: Surry Power Station, Units 1 & 2

Location: 5850 Hog Island Road
Surry, VA 23883

Dates: April 1 - June 30, 2005

Inspectors: N. Garrett, Senior Resident Inspector
D. Arnett, Resident Inspector
R. Carrion, Project Engineer (Sections 2OS1 and 4OA1)
R. Chou, Reactor Inspector (Sections 1R08, 4OA5)
J. Fuller, Reactor Inspector (Sections 1R08, 4OA5)
L. Garner, Senior Project Engineer (Partial Sections 1R13 and 1R22)
H.Gepford, Health Physicist (Sections 2OS2, 2PS2, and 4OA5)
F. Wright, Senior Health Physicist (Sections 2OS2)

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

Enclosure

CONTENTS

SUMMARY OF FINDINGS 1
REPORT DETAILS 3

REACTOR SAFETY
1R01 Adverse Weather Protection 3
1R04 Equipment Alignment 3
1R05 Fire Protection 4
1R06 Flood Protection Measures 5
1R08 Inservice Inspection Activities 5
1R11 License Operator Requalification 9
1R12 Maintenance Effectiveness 9
1R13 Maintenance Risk and Emergent Work Control 10
1R14 Operator Performance During Non-routine Evolutions and Events 10
1R15 Operability Evaluations 11
1R19 Post Maintenance Testing 11
1R20 Refueling and Outage Activities 12
1R22 Surveillance Testing 13
1R23 Temporary Plant Modifications 14

RADIATION SAFETY
2OS1 Access Controls to Radiologically Significant Areas 15
2OS2 ALARA Planning and Controls 16
2PS2 Radioactive Material Processing and Transportation 18

OTHER ACTIVITIES
4OA1 Performance Indication Verification 19
4OA2 Identification and Resolution of Problems 20
4OA3 Event Follow-up 24
4OA4 Cross Cutting Aspects of Findings 25
4OA5 Other Activities 25
4OA6 Meetings, Including Exit 26
4OA7 Licensee Identified Violations 26

ATTACHMENT: SUPPLEMENTAL INFORMATION
Key Points of Contact A- 1
List of Items Opened and Closed A- 1
List of Documents Reviewed A- 2

SUMMARY OF FINDINGS

IR 05000280/2005-003, IR 05000281/2005-003; 04/01/2005-06/30/2005; Surry Power Station Units 1 & 2. Identification and Resolution of Problems.

The report covered a three month period of inspection by resident inspectors, a project engineer, a senior project engineer, a health physicist, a senior health physicist, and two reactor inspectors. Two Green non-cited violations (NCV) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using 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 10CFR50, Appendix B, Criterion XVI, "Corrective Action" for failure to promptly correct a condition adverse to quality. The licensee identified, but did not promptly correct, the high vibration condition on the Unit 2 'B' safety injection pump, 2-SI-P-1B. The issue was identified in April 2002 but was not corrected until October 2004.

  The finding was determined to be more than minor because it affected the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capacity of systems that respond to initiating events to prevent undesirable consequences. The finding was associated with the equipment performance and human performance attributes of the cornerstone. The finding affects the Mitigating Systems Cornerstone function of core decay heat removal and is of low safety significance (Green) because it did not result in the loss of a safety function of a single train for greater than the Technical Specification allowed outage time and is not risk significant in response to external events. The finding is also related to the cross-cutting area of identification and resolution of problems because the cause of the vibration condition was not promptly identified and corrected by the licensee. (Section 4OA2.2)

- Green. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action" for failure to prevent recurrence of a condition adverse to quality. The licensee identified but did not take corrective actions to prevent recurrence of thru-wall leaks in service water related components on main control room chillers '4D' and '4E'. At least 11 thru-wall leaks have occurred between June 1995 and February 2005 without proper corrective actions to address the cause.

  The finding was determined to be more than minor because it affects the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable

consequences. The finding is associated with the equipment performance and design control attributes of the cornerstone. The finding affects the Mitigating Systems Cornerstone function of core decay heat removal and is of low safety significance (Green) because it did not result in the loss of a safety function of a single train for greater than the Technical Specification allowed outage time and is not risk significant in response to external events. The finding is also related to the cross-cutting area identification and resolution of problems because corrective actions were not taken to prevent recurrence of the flow accelerated corrosion condition. (Section 4OA2.2)

B. Licensee-Identified Violations

Two violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near 100% for the entire report period.

Unit 2 started the report period at 100% reactor power. On April 24, 2005, the unit was shutdown for a refueling outage. On May 22, Unit 2 was taken critical, placed on-line May 23, and achieved 100% power on May 24, 2005. On May 30, 2005, the unit was ramped to 75% to repair a high pressure heater drain pump level controller.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

On June 6, 2005, the licensee entered hot weather conditions when temperatures reached over 90EF. The inspectors reviewed Operations Checklist OC-21, "Severe Weather Checklist," operations logs, and performed walkdowns of various components in the auxiliary building and turbine building to verify adequate compensatory actions were taken to mitigate the effects of hot weather.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns

a. Inspection Scope

The inspectors performed partial walkdowns of the following three systems to verify correct system alignment. The inspectors checked for correct valve and electrical power alignments by comparing positions of valves, switches, and breakers to the applicable procedures and drawings. The inspectors reviewed the corrective action database to verify that equipment alignment issues are being identified and resolved. The documents reviewed are listed in the Attachment.

- Unit 1 main control room air chillers 1-VS-E-4A, 4B, and 4C while 1-VS-E-4D and 4E were tagged out for maintenance
- Unit 1 component cooling pumps 1-CC-P-1A, 1B, and 1D while 1-CC-P-1C was tagged out for maintenance on the 'H' stub bus

- Unit 1 self cleaning strainers for main control room air conditioning and chemical and volume control pump service water, 1-VS-S-1A & 1B following maintenance

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors performed a detailed walkdown on the accessible portions of the Unit 2 residual heat removal (RHR) system to review the system alignment and condition. The walkdown emphasized pump and piping overall condition, status of boric acid leaks and associated targets, plant issues associated with system deficiencies, valve and breaker position verification, and component labeling. The inspectors reviewed the corrective action database to verify that equipment alignment issues are being identified and resolved. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Area Walkdowns

a. Inspection Scope

The inspectors conducted tours of the following nine 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 in the areas listed. The documents reviewed are listed in the Attachment.

- Unit 1 emergency switchgear room
- Battery room 1A
- Battery room 1B
- Battery room 2A
- Number 3 mechanical equipment room
- Number 2 emergency diesel generator room
- Unit 1 main steam valve house and auxiliary feed water
- Fuel oil pump room “A”
- Fuel oil pump room “B”

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and the Individual Plant Examination (IPE) of Non-Seismic External Events and Fires for analyzed external and internal floods. Walkdowns were performed in the turbine building and auxiliary building to review compliance with procedures for internal and external flooding. In addition, the inspectors walked down various expansion joint shields and flood and spill control dams. The inspectors compared observed equipment condition and documented system deficiencies to determine system readiness for flood prevention. The inspectors reviewed completed preventive maintenance and surveillance records for the turbine building sump pumps, station and turbine building flood detection equipment, and floor drain back water stop valve replacement. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection Activities

.1 Piping Systems Inservice Inspection (ISI)

a. Inspection Scope

From May 2 - 13, 2005, the inspectors reviewed the implementation of the licensee's ISI program for monitoring degradation of the reactor coolant system boundary and the risk significant piping system boundaries for Unit 2. The inspectors selected a sample of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI required examinations and Code components in order of risk priority as identified in Section 71111.08-03 of inspection procedure 71111.08, "Inservice Inspection Activities," based upon the ISI activities available for review during the onsite inspection period.

The inspectors conducted an on-site review of nondestructive examination (NDE) activities to evaluate compliance with Technical Specifications (TS), ASME Section XI, and ASME Section V requirements, 1998 Edition through 2000 Addenda, and to verify that indications and defects (if present) were appropriately evaluated and dispositioned in accordance with the requirements of ASME Section XI.

Specifically, the inspectors observed the following examinations:

Ultrasonic Testing (UT):

- Weld Number(s): 2-30 and 3-01 on line 6'-SI-248-1502, Safety Injection Check Valve Welds, ASME Class 2

- Category B-F, Inlet Nozzle Dissimilar Metal (DM) Weld @ 265E, weld numbers RC-11-1 and 1-17DM, part of the 10-year in-vessel ISI, ASME Class 1

Specifically, the inspectors reviewed the following examination records:

Visual Testing (VT):
- Visual Examination of Reactor Pressure Vessel Bottom Mounted Instrumentation (BMI)

Liquid Penetrant Testing (PT) / Pre-Service Examination (PSI)
- PSI on 3" Charging Replacement Valve, 02-CH-MOV-2287C, ASME Class 2,

The Inspectors reviewed examination records for the following recordable indications to evaluate if the licensee's acceptance was in accordance with acceptance standards contained in Article IWB-3000 of ASME Section XI.

Ultrasonic Testing (UT):
- Weld Number: 1-03 on line 14'-WFPD-113-601, Circumferential weld, ASME Class 2

Liquid Penetrant Testing (PT):
- Weld 0-18 on 2-SI-P-1B, ASME Class 2 Low Pressure Safety Injection Pump Casing Weld
- Weld 0-21 on 2-SI-P-1B, ASME Class 2 Low Pressure Safety Injection Pump Casing Weld
- Weld 0-26 on 2-SI-P-1B, ASME Class 2 Low Pressure Safety Injection Pump Casing Weld
- Weld 0-28 on 2-SI-P-1B, ASME Class 2 Low Pressure Safety Injection Pump Casing Weld
- Weld 0-29 on 2-SI-P-1B, ASME Class 2 Low Pressure Safety Injection Pump Casing Weld

Qualification and certification records for examiners, inspection equipment, and consumables along with the applicable NDE procedures for the above ISI examination activities were reviewed and compared to requirements stated in ASME Section V and Section XI.

A sample of pressure boundary welding activities associated with ASME Class 2 components were reviewed, to verify the welding process and examinations were performed in accordance with the ASME Code Sections III, V, IX, and XI requirements. The inspectors reviewed the weld data sheets, Welding Techniques Sheet, and preservice examination (PSI) results for the following welds:

- 0-03A on 02-CH-MOV-2287C, 3" Charging Line Pipe to 3" Elbow
- 0-04A on 02-CH-MOV-2287C, 3" Charging Line Elbow to 3" Pipe
- 0-05A on 02-CH-MOV-2287C, 3" Charging Line Pipe to 3" Elbow

- 0-08A on 02-CH-MOV-2287C, 3" Charging Line Elbow to 3" Pipe
- 0-09A on 02-CH-MOV-2287C, 3" Charging Line Valve to 3" Elbow

The inspectors performed a review of piping system ISI related problems that were identified by the licensee and entered into the corrective action program. The inspectors reviewed these corrective action documents to confirm that the licensee had appropriately described the scope of the problems. Through interviews with licensee staff and review of licensee actions to incorporate lessons learned from industry issues related to the ISI program, the inspectors evaluated the licensee's threshold for identifying issues and entering them into the corrective action program. The inspectors compared the licensee's action with the requirements of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action." The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.2 PWR Vessel Upper Head Penetration (VUHP) Inspection Activities

a. Inspection Scope

The inspectors reviewed activities to ensure licensee compliance with the requirements of NRC Order EA-03-009. The inspectors reviewed the scope of the licensee's activities as they related to examination of the pressure retaining components above the Reactor Pressure Vessel (RPV) head to ensure that all possible sources of boric acid leakage were included, that the examination would be effective in identifying boric acid leakage in this area, and that appropriate actions would be implemented should boron deposits be identified on the RPV head or related insulation.

b. Findings

No findings of significance were identified.

.3 Boric Acid Corrosion Control (BACC) ISI

a. Inspection Scope

From May 2 - 6, 2005, the inspectors reviewed the licensee's BACC program to ensure compliance with commitments made in response to NRC Generic Letter 88-05 "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary," and Bulletin 2002-01 "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity."

The inspectors conducted an on-site record review as well as an independent walk-down of parts of the reactor building that are not normally accessible during at-power operations to evaluate compliance with licensee BACC program requirements and 10

CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” requirements. In particular, the inspectors reviewed to ensure that the visual examinations focused on locations where boric acid leaks can cause degradation of safety significant components and that degraded or non-conforming conditions were properly identified in the licensee’s corrective action system.

The inspectors reviewed a sample of engineering evaluations completed for boric acid found on reactor coolant system piping and components to verify that the minimum design code required section thickness had been maintained for the affected component(s). The inspectors also reviewed licensee corrective actions implemented for evidence of boric acid leakage to confirm that they were consistent with requirements of Section XI of the ASME Code and 10 CFR 50 Appendix B Criterion XVI. Specifically, the inspectors reviewed:

- 1-CH-510, Seal Injection Isolation Packing Gland with dry, white, boric acid buildup (Plant Issue S-2005-1247-R1)
- 2-SI-91, Boric Acid on Body to Bonnet Surface, ASME Class 2 (Plant Issue S-2005-1870-R1)
- 1-CH-P-1C-PUMP, Boric Acid Found from the Suction Side Elbow Upstream Flange, with Corroded Fasteners (Plant Issue S-2005-1649-R1)

b. Findings

No findings of significance were identified.

.4 Steam Generator (SG) Tube ISI

a. Inspection Scope

From May 9 - 12, 2005 the inspectors reviewed the Unit 2 SG tube examination activities conducted pursuant to TS and the ASME Code Section XI requirements.

The inspectors reviewed activities, plans, pre-outage degradation assessment and procedures for the inspection and evaluation of the steam generator Inconel Alloy 600TT tubing to determine if the activities were being conducted in accordance with TS and applicable industry standards. Data gathering, analysis, and evaluation activities were reviewed, with special emphasis on evaluation of the eddy current data for wear indications due to the external objects in the secondary side in nine (9) tubes, including R31C28 and R32C28 on top of the tube sheet area in SG ‘C’. The inspectors also reviewed the data analyst’s certification and qualifications including the medical exams.

b. Findings

No findings of significance were found.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed licensed operator performance during simulator training session RQ-05.3-ST-1 to determine whether the operators:

- were familiar with and could successfully implement the procedures associated with recognizing and recovering from a failure of the pressurizer master pressure controller and recover from the loss of secondary heat sink under various conditions;
- 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 two 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. The documents reviewed are listed in the Attachment.

- Unit 1 & 2 main control room chillers '4D' and '4E', 1-VS-E-4D/E, service water side wall thinning, and
- Unit 2 safety injection pump, 2-SI-P-1B repair

b. Findings

Corrective action violations associated with the Unit 2 'B' safety injection pump and the Unit 1 and Unit 2 main control room chillers '4D' and '4E' are documented in Section 4OA2.

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:

- POD for week 4/9 - 15 for schedule changes and risk impact including extending maintenance on the Unit 2 residual heat removal pump breaker, 2-EP-BKR-25H11 and troubleshooting efforts for Unit 2 pressurizer spray valves 2-RC-PCV-2455A & B.
- POD for week 4/22 - 28 for schedule changes and risk impact including addition of number 2 emergency diesel generator (EDG) monthly surveillance and the failure of the Unit 2 'B' low head safety injection pump, 2-SI-P-1B, breaker during logic testing.
- 24 Hour PSA Model Look Ahead schedules on May 4 and May 5 for schedule changes and risk impact including maintenance on the Unit 2 J electrical bus with Unit 2 DC buses cross-tied.
- POD for week June 4 - 11 for schedule change and risk impact including maintenance on the Unit 1 station air compressor, 1-SA-C-1, Unit 1 self cleaning strainers for main control room air conditioning and chemical and volume control pump service water, 1-VS-S-1A & B, and the diesel driven fire pump, 1-FP-P-2
- POD for week June 18 - 24 for schedule changes and risk impact including addition of Unit 1 station air compressor, 1-SA-C-1, for emergent work, inclusion of number 2 EDG quarterly run, and extension of the alternate AC diesel generator work due to added trouble shooting.

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Non-routine Evolutions and Events

a. Inspection scope

For the three non-routine event described below, the inspectors reviewed operator logs, plant computer data, and strip charts to determine what occurred and how the operators responded, and to verify if the response was in accordance with plant procedures;

- Fire on the access road and at the simulator building following failure of a pole mounted meter current transformer
- Unit 2 'A' steam generator high water level following full open failure of 'A' feed regulation valve
- Unit 2 down-power for repair of high pressure drain pump level controller

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

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

- S-2005-1507, Unit 1 main control room chiller '4E', 1-VS-E-4E, experienced pipe wall degradation at several elbow locations
- S-2005-1919, Unit 2 low head safety injection pump, 2-SI-P-1B, breaker failed to auto-close upon demand signal during 'J' bus logic test
- S-2005-2416, Over-thrust condition of 2-SI-MOV-2865B, 'B' accumulator outlet isolation motor operated valve (MOV)
- S-2005-2605, Over-torque of 2-SW-MOV-204C, 'C' recirculation spray heat exchanger inlet isolation MOV
- S-2005-2813, 2-FW-P-2, Unit 2 turbine driven auxiliary feed pump, experienced an over pressure of the discharge piping during the performance of a special test run
- S-2005-1927, 1-SW-P-1A, 'A' emergency service water pump discharge piping wall thinning

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the six 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 of the following equipment:

- Work Order (WO) 510441, Repair of 'B' low head safety injection (SI) pump, 2-SI-P-1B
- WO 510260-06, Replacement of '2B' motor driven auxiliary feedwater pump, 2-FW-P-2B, and pin hole repair
- WO 522078-01, Replacement of 'A' emergency service water pump, 1-SW-P-1A, discharge line
- WO 439369-01, Inspect and repair 2-SI-241, SI outlet to cold leg check valve

- WO 486499-01, Replacement of charging pump service water strainer 2-SW-S-2B
- WO 599365-01, Replacement of safeguards actuation relay SI3A, 2-SI-RLY-SI3A

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 spring refueling outage that began on April 24, 2005, and ended May 23, 2005.

The inspectors reviewed the licensee's outage risk control plan (Surry Unit 2 2005 RFO Shutdown Risk Review Initial Report, 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;

- Observed spent fuel pool operations to verify that outage work was not impacting the ability of the operations staff to operate the spent fuel pool cooling system during and after core offload;

- 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;

- Observed licensee control of containment penetrations to verify that the licensee controlled those penetrations in accordance with the refueling operations technical specifications and could achieve containment closure for required conditions; and,

- The inspectors reviewed fuel handling operations to verify that those operations and related activities were being performed in accordance with technical specifications and approved procedures.

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. The inspectors reviewed RCS boundary leakage and the setting of containment integrity. The inspectors examined the spaces inside the containment building prior to reactor startup to verify that debris had not been left which could affect performance of the containment sumps.

The inspectors reviewed various problems that arose during the outage to verify that the licensee was identifying problems related to refueling outage activities at an appropriate threshold and entering them in the corrective action program. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the seven 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:

Surveillance Tests

- 2-EPT-0106-06, Main Station Battery 2A Performance Test
- 2-OPT-SI-007, Refueling Test of the High Head Safety Injection Check Valves to the Cold Legs
- 2-OPT-RS-001, Outside Recirculation Spray Pump Flow and Leak Test
- 2-OPT-EG-001, #2 Emergency Diesel Generator Monthly Start Exercise Test

In-Service

- 1-OPT-CH-003, Charging Pump Operability and Performance Test for 1-CH-P-1C

Containment Isolation

- 2-OPT-CT-201, Containment Isolation Valve Local Leak Rate Testing for Penetration 100
- 2-OPT-CT-201, Containment Isolation Valve Local Leak Rate Testing for Penetration 92

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following two temporary modifications to determine whether system operability/availability was affected, that configuration control was maintained, and that the associated safety evaluation adequately justified implementation:

- S2-05-032, Unit 2 polar crane breaker installation
- S2-05-034, Installation of four cameras inside Unit 2 containment to monitor pressure operated relief valve back-up air supply bottle pressure

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Controls To Radiologically Significant Areas

a. Inspection Scope

Access Controls Licensee program activities for monitoring workers and controlling access to radiologically significant areas and tasks were evaluated. The inspectors evaluated procedural guidance; directly observed implementation of administrative and established physical controls; assessed worker exposures to radiation and radioactive material; and appraised radiation worker and technician knowledge of, and proficiency in, the implementation of radiation protection (RP) program activities.

The inspectors evaluated the licensee's procedures for posting, surveying, and controlling access to radiation areas, high radiation areas (HRAs), and very high radiation areas (VHRAs) against the requirements of 10 CFR Part 20. The inspectors evaluated radiological postings and barricades against the current radiological surveys in areas of the auxiliary buildings to determine the appropriateness of the established radiological controls. In addition, the inspectors independently verified the dose rates recorded on current survey maps at various locations in plant areas. General area dose rates were compared to licensee survey records. The inspectors observed health physics (HP) technician proficiency in performing and documenting the radiation surveys for observed activities.

During the inspection, radiological controls for ongoing Unit 2 refueling activities were observed and discussed. In addition, licensee controls for selected tasks scheduled and ongoing during the current refueling outage (RFO) were assessed. The evaluations included radiation work permit (RWP) details, use and placement of dosimetry and air sampling equipment, and monitoring and assessment of worker dose from direct radiation and airborne radioactivity source terms. Effectiveness of established controls was assessed against area radiation and contamination survey results and occupational doses received. Access controls for locked high radiation areas were reviewed and discussed with radiation protection management and supervision. The inspectors directly inspected the designated locked door locations and reviewed documentation to verify the condition and status of the locked doors. The inspectors also evaluated implementation of key controls and postings for VHRAs and locked high radiation areas.

Occupational workers' adherence to selected RWPs and HP technician proficiency in providing job coverage were evaluated through direct observations of staff performance during job coverage and routine surveillance activities, review of selected exposure records, and interviews with cognizant licensee staff. The inspectors observed radiologically significant work areas within radiation areas, high radiation areas, and the spent fuel pool storage area. The licensee's physical and procedural controls for highly activated or contaminated materials (non-fuel) stored within the spent fuel pool were

also reviewed with licensee representatives. The inspectors conducted independent radiological surveys of selected plant areas and compared the results to the licensee's surveys. Radiological postings and barricade requirements were evaluated for the observed areas. Occupational exposures associated with direct radiation and potential radioactive material intakes were reviewed and discussed with cognizant licensee representatives.

The inspectors reviewed the extent of airborne radiological hazards and associated controls. Airborne radiological areas and resulting internal exposures since the last NRC inspection were reviewed with the licensee's technical staff. During observation of selected tasks, the use of engineering controls to minimize airborne radioactivity were evaluated

Radiation Protection program activities and their implementation were evaluated against 10 CFR 19.12; 10 CFR Part 20; the Updated Final Safety Analysis Report (UFSAR) Section 12, RP; Technical Specification (TS) Section 6.4; and approved licensee procedures. Licensee documents, records, and data reviewed within this inspection area are listed in Section 2OS1 of the report Attachment.

Problem Identification and Resolution Licensee corrective action program (CAP) documents associated with access control to radiologically significant areas were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues. Licensee Plant Issue documents related to access control that were reviewed and evaluated in detail during inspection of this program area are listed in the Attachment.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Control

a. Inspection Scope

ALARA The inspectors reviewed pertinent information regarding plant collective exposure history including recent year performance trends and ongoing activities during the Unit 2 RFO. The licensee's methodology for estimating job exposures and the dose tracking system were reviewed and evaluated. Site specific trends in collective exposures, plant historical data, and plant source term controls were reviewed with licensee personnel. ALARA procedures reviewed are listed, and the integration into the work management process are included, in part, in Section 2OS2 of the report Attachment.

The inspectors made direct field or closed-circuit-video observations of outage job tasks including insulation removal, steam generator sludge lancing, fuel movement, and radiography activities. Radiation worker practices and HP technician coverage were

evaluated for proper radiation protection and ALARA techniques during observations of those activities.

ALARA planning documents and procedural guidance were reviewed and projected dose estimates were compared to actual dose expenditures for high dose jobs associated with the Unit 1 RFO in 2004 including: reactor head and upper internals removal and replacement, reactor dissassembly/reassembly, insulation and scaffold related activities, and removal/reinstallation of lower internals.

The inspectors attended pre-job briefings and evaluated the communication of ALARA goals, RWP requirements, and industry lessons-learned to radiation workers. Reviews were made to verify that the licensee had established work plans, engineering and exposure work controls, and RWPs that were ALARA. The ALARA work activities were based on historical data, industry techniques, and ALARA staff recommendations.

The process for shielding, both permanent and temporary, was reviewed for effectiveness and efficiency with the ALARA staff. ALARA shielding was observed directly in plant walk-downs, remotely with cameras, and in licensee pre-job briefing materials. The inspectors noted the use of water as shielding when appropriate.

Plant exposure history and data reported to the NRC pursuant to 10 CFR 20.2206 were reviewed, as were established goals for reducing collective exposure during the outage. The inspectors reviewed procedural guidance for dosimetry issuance and exposure tracking.

ALARA program activities and their implementation were reviewed against 10 CFR Part 20, and approved licensee procedures. In addition, licensee performance was evaluated against Regulatory Guide (RG) 8.8, Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will be As Low As Reasonably Achievable; and RG 8.10, Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As is Reasonably Achievable. Procedures and records reviewed within this inspection area are listed in Sections 2OS1 and 2OS2 of the report Attachment.

Problem Identification and Resolution The inspectors reviewed the recent audit addressing the radiation protection program, including ALARA activities. The audit plan and checklist were also reviewed. The inspectors verified that identified problems were entered into the corrective action program for resolution. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation

a. Inspection Scope

Waste Processing and Characterization Selected liquid and solid radwaste processing system components were inspected for material condition and for configuration compliance with the UFSAR and process control program (PCP). Inspected equipment included liquid collection tanks, evaporator bottoms tank, laundry prefilters, laundry filters, laundry drain monitor tanks, reverse osmosis equipment, bitumin solidification process equipment, and associated piping, valves, and pumps. The inspectors observed processing of liquid waste by the reverse osmosis system. The inspectors discussed component function, processing system changes, and radwaste program implementation with licensee staff.

The 2004 Effluent Report and radionuclide characterizations from September 2004 - January 2005 for each major waste stream were reviewed and discussed with the radwaste staff. For letdown filter and the blend tank samples, the inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined comparison results between licensee waste stream characterizations and outside laboratory data. Waste stream mixing and concentration averaging methodology was evaluated and discussed with radwaste personnel. The inspectors also discussed the licensee's guidance for monitoring changes in waste stream isotopic mixtures with radwaste personnel.

Radwaste processing activities were reviewed for compliance with the licensee's PCP and UFSAR, Chapter 11. Waste stream characterization analyses were reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 61, and guidance provided in the Branch Technical Position on Waste Classification and Waste Form. Reviewed documents are listed in the Attachment.

Transportation The inspectors directly observed preparation activities for a shipment of contaminated equipment. The inspectors noted package markings and placarding, performed independent dose rate measurements, and interviewed shipping technicians regarding Department of Transportation (DOT) regulations.

Six shipping records were reviewed for consistency with licensee procedures and compliance with NRC and DOT regulations. The inspectors reviewed emergency response information, DOT shipping package classification, radiation survey results, and evaluated whether receiving licensees were authorized to accept radioactive materials. Licensee procedures for opening and closing Type A boxes and Type B shipping casks were compared to recommended vendor protocols and Certificate of Compliance requirements. In addition, training records for selected individuals currently qualified to ship radioactive material were reviewed.

Transportation program implementation was reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 71, 49 CFR Parts 172-178; as well as the guidance provided in NUREG-1608. Training activities were assessed against 49 CFR Part 172 Subpart H. Documents reviewed during the inspection are listed in the Attachment.

Problem Identification and Resolution Four Plant Issues and one audit were reviewed in detail and discussed with licensee personnel. The inspectors assessed the licensee's ability to characterize, prioritize, and resolve the identified issues in accordance with licensee procedure VPAP-1601, Corrective Action, Revision (Rev.) 20. Documents reviewed for problem identification and resolution are listed in the Attachment.

b. Findings

No findings of significance were identified.

4 OTHER ACTIVITIES

4OA1 Performance Indicator Verification

a. Inspection Scope

The inspectors sampled licensee data submitted to the NRC for the performance indicators (PIs) listed below for the period from July 1, 2004, through March 31, 2005. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Indicator Guideline," Revision 3, were used.

Occupational Exposure Control Effectiveness

For the specified period, the inspectors assessed CAP documents to determine whether HRA, VHRA, or unplanned exposures, resulting in TS or 10 CFR 20 non-conformances, had occurred. For the specified period, the inspectors evaluated data reported to the NRC and subsequently sampled and assessed applicable CAP documents and selected Health Physics Program records. The reviewed records included personnel exposure investigation reports. Reviewed documents relative to this PI are listed in the Attachment.

RETS/ODCM Radiological Effluents Occurrence

The inspectors reviewed and evaluated selected radiological liquid and gaseous effluent release data, abnormal release results, cumulative and projected doses to the public, and selected plant issue records for the period of July 1, 2004, through March 31, 2005. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

.1 Daily Review of Plant Issues

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished by reviewing hard copies of each condition report, attending daily screening meetings, and accessing the licensee's computerized database as required.

b. Findings

No findings of significance were identified.

.2 Annual Sample Review

a. Inspection Scope

The inspectors performed an in-depth review of the plant issues associated with the high vibrations on the Unit 2 'B' safety injection pump and the plant issues associated with repeated failure of service water related components on the Unit 1 and Unit 2 main control room air chillers '4D' and '4E'. The review was performed to ensure the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors evaluated the plant issues against the requirements of the licensee's corrective action program as delineated in Station Administrative Procedure VPAP-1601, "Corrective Action," and 10 CFR 50 Appendix B, Criterion XVI, "Corrective Action."

b. Findings

Safety Injection Pump High Vibrations

Introduction. The inspectors identified a Green Non-cited Violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for failure to promptly correct a condition adverse to quality. Specifically, the licensee failed to promptly correct a high vibration condition in the Unit 2 'B' safety injection (SI) pump, 2-SI-P-1B.

Description. On April 14, 2002, the licensee completed the replacement of the mechanical seal on the Unit 2 'B' SI pump and performed a return to service test. The pump horizontal motor vibrations were in the Alert range during the pump run and the new mechanical seal leaked. This was documented in plant issue S-2002-1403. The corrective action was to reseat the mechanical seal. During the subsequent pump run, vibrations were reduced to below the Alert range and the seal leak was stopped. The licensee increased the frequency of pump surveillance tests and on May 20, 2002,

pump motor vibrations were again in the Alert range. Plant Issue S-2002-4012 was written on December 24, 2002, and Plant Issue S-2003-0992 was written on May 10, 2003, for motor vibrations being in the Alert range. Plant Issue S-2003-3745 was written on August 18, 2003, to perform a trend review on the motor vibration problems. This plant issue was closed in part by referencing a vendor study on the pump vibration problems. Plant Issue S-2003-4473 was written on October 2, 2003, during an extended refueling outage to document motor vibrations in the inoperable range. The licensee performed a modification to add stiffeners to the pump motor to reduce vibrations and the pump was returned to service. However, vibrations remained in the Alert range. Plant Issue S-2003-1603 was written on December 11, 2003, to document motor vibrations in the Alert range. Plant Issue S-2003-1603 was written on April 27, 2004, to document that two bolts on the motor to pump coupling were found with the lockwashers not fully compressed. Plant Issue S-2004-3244 was written on September 19, 2004, to document that the upper motor bearing was in Alert. Plant Issue S-2004-3601 was written on October 19, 2004 to document the failure of the mechanical seal. As the result of this failure, the mechanical seal was replaced. During the seal replacement activity, the two bolts, which did not have proper lockwasher engagement, were determined to be too long for the coupling. The bolts had bottomed out in the coupling and did not properly provide mechanical joining of the coupling. The two bolts were replaced and on the subsequent return to service run, pump vibrations were reduced to the levels recorded prior to the mechanical seal replacement in April 2002.

Analysis. The inspectors considered the licensee's failure to take timely corrective action to reduce the pump vibration below the Alert range a performance deficiency. From the time of the mechanical seal replacement in April 2002, and October 2004, the licensee had adequate opportunities to determine and correct the cause of the elevated pump vibrations. In addition, when the cause of vibrations (bolts not compressing the lockwashers) were noted in April 2004, the possible cause of the vibrations was not repaired until October 2004.

The finding was determined to be more than minor because it affected the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capacity of systems that respond to initiating events (loss of coolant accidents) to prevent undesirable consequences (core damage). The finding was associated with the equipment performance and human performance attributes of the cornerstone. The finding was evaluated using the Phase 1 process of Appendix A to Manual Chapter 0609. The finding affects the Mitigating Systems Cornerstone function of core decay heat removal and is of low safety significance (Green) because it did not result in the loss of a safety function of a single train for greater than the Technical Specification allowed outage time and is not risk significant in response to external events (seismic, flood, and severe weather). The finding is also related to the cross-cutting area of problem identification and resolution of problem because the vibration condition was not promptly corrected by the licensee.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires in part that conditions adverse to quality are promptly corrected. Contrary to this requirement, the licensee failed to promptly correct the condition causing high vibration

in the Unit 2 'B' SI pump, 2-SI-P-1B from April 2002 until October 2004. However, because of the very low safety significance and because the issue was entered into the corrective action system as Plant Issue 2004-3601, and the deficient condition was corrected, this finding is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000281/2005003-01, Failure to Promptly Correct High Vibrations on a Safety Injection Pump

Service Water Component Failures In Chillers

Introduction: The inspectors identified a Green NCV of 10CFR50, Appendix B, Criterion XVI, "Corrective Action", for failure to prevent recurrence of a significant condition adverse to quality. Specifically, the licensee failed to promptly take corrective actions for the high flow condition in the Unit 1 & Unit 2 main control room (MCR) chillers which caused recurring failures in the service water components.

Discussion: In 1993, 1-VS-E-4D & 1-VS-E-4E were installed to give the licensee physical separation of trains. In 1995, a condenser tube leak was discovered in both the '4D' and '4E' MCR chillers. For both thru-wall leaks, it was determined that erosion of the tube ends was the root cause. Between 1999 and 2004, the '4D' chiller condenser has been replaced three times and the '4E' chiller condenser once. The reason for replacement was tube leaks from the service water side attributed to flow accelerated corrosion (FAC). Between June 1995 and February 2005 the service water piping to the '4D' and '4E' chillers had experienced at least 11 thru-wall leaks associated with FAC.

The licensee performed several detailed examinations of the removed condensers and scrutinized the failures as part of their corrective actions program (CAP). The recommended corrective actions beginning in February, 2002, was to either reduce flow on the service water side of the condenser or change the piping design to increase the discharge line from its present size of 3" to 4". In December 2002, engineering decided not to pursue a design change package (DCP) regarding the '4E' chiller. In December, 2003, the root cause subfactor attributed to the thru-wall leak was that the system was not operated within design parameters and the recommended corrective actions were to replace all 3" service water lines in mechanical equipment room (MER) # 5. Plant Issue S-2005-0768-E1 documents an approved Request for Engineering Assistance (REA) to corporate engineering for a DCP to modify the service water system to prevent recurrence. Three thru-wall leaks occurred after the initial determination that the 3" piping should be upgraded to 4" and the time that the REA was approved to correct the condition. This process will take two to five years to complete and implement.

Analysis: The inspectors considered the licensee's failure to take prompt action to preclude recurrence of thru-wall leaks in the MCR condensers a performance deficiency. From the first recognition of FAC in 1995 to the initiation of a REA, the licensee had adequate opportunities to determine and correct the cause of the thru-wall leaks.

The finding was determined to be more than minor because it affects the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of

systems that respond to initiating events to prevent undesirable consequences. Specifically, the MCR chillers provide cooling to prevent equipment failures of safety-related equipment in the main control room and the emergency switchgear rooms due to overheating. The finding is associated with the equipment performance and design control attributes of the cornerstone.

The finding was evaluated using the Phase 1 process of Appendix A to Manual Chapter 0609. The finding affects the Mitigating Systems Cornerstone function of core decay heat removal and is of low safety significance (Green) because it did not result in the loss of a safety function of a single train for greater than the Technical Specification allowed outage time and is not risk significant in response to external events. The finding is also related to the crosscutting area of identification and resolution of problems because corrective actions were not promptly taken to prevent recurring failure of service water related components due to the FAC condition.

Enforcement: 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” requires, in part, that in the case of significant conditions adverse to quality, measures shall assure that the cause of the condition is determined and corrective action taken to preclude reoccurrence. Contrary to the above, since June 1995 to February 2005 at least 11 thru-wall leaks on the service water side of the MCR chillers have occurred that have rendered either or both ‘4D’ and ‘4E’ chillers inoperable. Because the finding is of very low safety significance and because it has been entered into the corrective action program as Plant Issue S-2005-0768, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000280,281/2005-003-02, Inadequate Corrective Action Resulting in Recurring Thru-wall Leaks on Main Control Room Chillers ‘4D’ and ‘4E’.

.3 Semi-Annual Review of Plant Issues

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," the inspectors performed a review of the licensee’s corrective action program (CAP) and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors’ review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The inspectors’ review normally covered the six month period of January 2005, through June 2005, although some examples expanded beyond those dates when the scope of the trend warranted. The review also included issues documented outside the normal CAP in major equipment problem lists, repetitive and/or rework maintenance lists, system health reports, quality assurance audit/surveillance reports, self assessment reports, and maintenance rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee’s latest quarterly trend reports. Corrective actions associated with a sample of the issues identified in the licensee’s trend report were reviewed for adequacy.

The inspectors also evaluated the report against the requirements of the licensee's corrective action program as specified in VPAP-1601, Corrective Action and 10 CFR 50, Appendix B. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified. The inspectors evaluated the licensee trending methodology and observed that the licensee had performed detailed reviews under various systems. The licensee routinely reviewed cause codes, involved organizations, key words, and system links to identify potential trends in their corrective action program data. The licensee performs statistical evaluation of plant issue data to determine areas of focus for the various plant departments. However, the focus areas are broad such as procedural compliance or human performance. The inspectors reviewed plant issues associated with the Unit 2 'B' SI pump vibration issue and with the MCR air chillers 1-VS-E-4D and 4E. The licensee documented one trend review, Plant Issue S-2003-3745, for pump vibration PI's. For each PI written, the licensee documents a search for similar PI's. However, in the case of the MCR air chillers there was no trend review documented. The corrective actions of the reviewed PI's do not indicate that prior lessons were carried forward.

4OA3 Event Follow-up

(Closed) LER 05000280, 281/2003006-00 Stream Generator AFW Isolation Unanalyzed Condition from Original Design

On December 12, 2003, the licensee determined that both Unit 1 and Unit 2 were in an unanalyzed condition with the auxiliary feedwater (AFW) motor operated valves (MOV) in a normal system alignment. The Surry AFW system consists of three AFW pumps and two feedwater headers which supply the three steam generators (SG). Each header has one MOV isolation valve for each SG on the header for a total of six MOVs. All of the MOVs are located inside containment. The MOVs on a particular header are powered from the same emergency bus. During a SG tube rupture concurrent with the loss of one emergency bus, the MOVs on the failed bus would remain in the open position preventing isolation of the ruptured SG. The licensee prepared a modification and installed stop check valves in the AFW supply header to each SG to prevent backflow from one steam generator to another. The inspectors reviewed the licensee root cause evaluation documented in Plant Issue S-2003-5901 and verified the installation and testing of the stop check valves in all the AFW feed headers on both units. This finding is more than minor because it has a credible impact on safety; in that, if a SG rupture occurred concurrent with a loss of an emergency bus, the ruptured SG could not be isolated. The accident analysis assumes that the ruptured SG is isolated to prevent release of radioactive material to the environment. This finding affects the Mitigating Systems Cornerstone and was considered to have very low safety significance using Appendix A of the SDP. This licensee-identified finding involved a violation of 10 CFR 50 Appendix B Criterion III - Design Control. The enforcement aspects of the violation are discussed in Section 4OA7.

4OA4 Cross Cutting Aspects of Findings

The two findings described in Section 4OA2 have as their primary cause problem identification and resolution. For the Unit 2 'B' safety injection pump vibrations the licensee failed to take prompt corrective actions to correct the problem.

For the main control room air chillers, 1-VS-E-4D and 4E, the licensee failed to correct the cause of thru-wall leaks in the service water lines to the chillers. Eleven thru-wall leaks occurred between June 1995 and February 2005. Three of these leaks occurred after a permanent corrective action was identified in 2002 and the time a REA was issued in 2005 to develop a DCP to correct the condition.

4OA5 Other Activities

.1 (Closed) Temporary Instruction 2515/161: Transportation of Reactor Control Rod Drives in Type A Packages

a. Inspection Scope

Based on interviews and record reviews, the inspectors determined that the licensee had undergone refueling activities during calendar year 2002 to the present. Subsequent to these activities, two shipments containing control rod drive mechanisms (CRDMs) were made. In June 2004, a shipment containing Part Length CRDMs was made. The shipment was as Low Specific Activity (LSA) in a strong tight container in accordance with 49 CFR 173.427(b)(3). In October 2004, a shipment containing the intact reactor pressure vessel head, including CRDMs, was made. This shipment was LSA-II in an Intact Vessel Head Transport System (DOT exemption, non-specification package). No shipments of CRDMs in Type A packages were made by the licensee during the specified time period.

b. Findings

No findings of significance were identified.

.2 (Closed) Temporary Instruction (TI) 2515/163 - Operational Readiness of Offsite Power

a. Inspection Scope

The inspectors collected data from licensee maintenance records, event reports, corrective action documents and procedures, and through interviews of station engineering, maintenance, and operations staff, as required by TI 2515/163. Appropriate documentation of the results was provided to headquarters staff for further analysis, as required by the TI. This completes the Region II inspection requirements for this TI for the Surry Site.

b. Findings

No findings of significance were identified.

.3 Independent Spent Fuel Storage Installation (ISFSI) Radiological Controls

a. Inspection Scope

The inspectors observed gamma-ray, neutron, and contamination surveys of the ISFSI facility and compared the results to previous monthly surveys and TS limits. The inspectors also observed and evaluated implementation of radiological controls, including RWPs and postings, and discussed the controls with an HP technician and the HP supervisory staff. The inspectors performed independent surveys of the ISFSI facility and compared them with measurements obtained by licensee personnel. Procedures for ISFSI radiological controls were also reviewed and discussed.

Radiological control activities for ISFSI areas were evaluated against 10 CFR Part 20, 10 CFR Part 72, ISFSI TS, and ISFSI Certificate of Compliance. Documents reviewed are listed in section 4OA5 of the report Attachment.

b. Findings

No findings of significance were identified.

.4 WANO Peer Review

On May 25, 2005, the senior resident inspector reviewed the World Association of Nuclear Operators (WANO) (interim) Peer Review of Surry Power Station dated February 7, 2005.

4OA6 Meetings, Including Exit

On July 6, 2005, the resident inspectors presented the inspection results to Mr. Jernigan and other members of his staff who acknowledge the findings.

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

4OA7 Licensee-identified Violations

The following findings of very low significance were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as Non-Cited Violations (NCV).

- Technical Specification 6.4 A.1 requires in part that detailed written procedures with appropriate check-off lists and instructions shall be provided for the

operations of components involving nuclear safety of the station. Licensee procedure GMP-012, “Roving Flood Watch Responsibilities,” requires that the water tight door to mechanical equipment room (MER) #3 to be closed or monitored. Contrary to this, on May 15, 2005, the watertight door to MER #3 was found open and unattended. This watertight door is a flood protection barrier between the MER and the emergency switchgear. The flood control door is located behind a fire door and is not readily observable. The exposure time is a conservative exposure time of 67 minutes that is based on the estimated time the work group left the room and the time the door was discovered open. Under the significance determination process (SDP), a regional Senior Reactor Analyst performed a Phase 3 analysis. The performance deficiency was characterized as of very low safety significance (Green) based upon the results of this analysis. The dominant accident sequence dealt with an unmitigated piping break originating within the Mechanical Equipment Room that eventually caused an unrecoverable failure of all onsite alternating current. The critical assumptions and major factors as to why the performance deficiency was of such low significance were the low frequency (< once per 1000 years) of piping rupture and the short exposure time (67 minutes). This issue was identified in Plant Issue S-2005-2502.

- 10 CFR 50 Appendix B Criterion III, “Design Control” requires in part that the design basis for those structures, systems, and components to which this appendix applies are correctly translated into specifications. Contrary to the above, the licensee failed to design the auxiliary feed water system to allow isolation of a ruptured steam generator on loss of one emergency bus as required by the plant accident analysis. The finding was determined to be more than minor because it affected the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capacity of systems that respond to initiating events (steam generator tube rupture) to prevent undesirable consequences (core damage). The finding was associated with the initial design attributes of the cornerstone. The finding was evaluated using Manual Chapter 0609 and determined to be of low safety significance (Green). The finding affects the Mitigating Systems Cornerstone for short term and long term decay heat removal and is of low safety significance (Green) because it did not result in the actual loss of a safety system and is not risk significant in response to external events (seismic, flood, and severe weather).

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

M. Adams, Director, Nuclear Station Safety and Licensing
M. Crist, Manager, Operations
B.Garber, Supervisor, Licensing
T. Huber, Manager, Engineering
D. Jernigan, Site Vice President
L. Jones, Manager, Radiation Protection and Chemistry
C. Luffman, Manager, Protection Services
R. MacManus, Manager, Training
S Hanson, Acting Manager, Nuclear Oversight
R. Simmons, Manager, Outage and Planning
K. Sloane, Director, Nuclear Station Operations and Maintenance
B. Stanley, Manager, Maintenance

NRC

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

LIST OF ITEMS OPENED AND CLOSED

Opened and Closed		
05000281/2005003-01	NCV	Failure to Promptly Correct High Vibrations on a Safety Injection Pump (Section 4OA2.2)
05000280,281/2005003-02	NCV	Inadequate Corrective Action Resulting in Recurring Thru-wall Leaks on Main Control Room Chillers ‘4D’ and ‘4E’ (Section 4OA2.2)
Closed		
050002880,281/2003006-00	LER	Steam Generator AFW Isolation Unanalyzed Condition from Original Design (Section 4OA3)
TI 2515/161	TI	Transportation of Reactor Control Rod Drives in Type A Packages (Section 4OA5.1)

TI 2515/163	TI	Operational Readiness of Offsite Power (Section 4OA5.2)

LIST OF DOCUMENT REVIEWED

Section 1R04: Equipment Alignment

Plant Procedures
0-OP-VS-006, Control Room and Relay Room Ventilation System
0-OP-VS-006A, Control Room and Relay Room Ventilation System Alignment
OP-49.1B, Service Water System - CR Chillers and Supply Strainers Valve Alignment
1-OP-51.5A, Charging Pump CC & SW System Valve Alignment
2-OP-51.5A, Charging Pump CC & SW System Valve Alignment
2-OP-RH-001, RHR Operations
2-OP-RH-002, Dewatering the Reactor Cavity with Fuel Loaded
2-OP-RH-003, Dewatering the Reactor Cavity to 16 ft with Fuel Off-Loaded
2-OP-RH-004, Dewatering the Reactor Cavity to Mid-Nozzle with Off-Fuel Loaded
2-AP-27.00, Loss of Decay Heat Removal Heat Capacity

Plant Drawing
11448-FB-041A
11448-FM-071B
11448-FM-071D
11448-FMC-072D
11548-FM-071B
11548-FM-87A

Section 1R05: Fire Protection

Documents
SPS Appendix R Report

Plant Procedures
0-FS-FP-115
0-FS-FP-122
0-FS-FP-186

Section 1R06: Flood Protection Measures

Plant Procedures
0-EPM-0805-01, Station Flood Protection Testing,
1-EPM-0805-01, Turbine Building Flood Control Testing
2-EPM-0805-01, Turbine Building Flood Control Testing

0-MPM-1900-01, Periodic Inspection of Flood and Spill Protection Dikes, Dams, and Expansion Joint Shields
0-MPM-1900-02, Flood Protection Floor Drain Back Water Stop Valve Replacement
0-AP-13.00, Turbine Building Flooding
0-AP-13.01, Uncontrollable Turbine Building Flooding
0-AP-37.01, Abnormal Environmental Conditions
1-OSP-PL-001, Performance Test of Turbine Building Sump Pumps 1-PL-P-2A, 1-PL-P-2B, 1-PL-P-2C (Turbine Building Sump No. 1)
1-OSP-PL-002, Performance Test of Turbine Building Sump Pumps 1-PL-P-2D, 1-PL-P-2E, 1-PL-P-2F (Turbine Building Sump No. 2)
2-OSP-PL-001, Performance Test of Turbine Building Sump Pumps 2-PL-P-2A, 2-PL-P-2B, 2-PL-P-2C (Turbine Building Sump No. 3)

Work Orders
WO 512682, 507694, 519582, 510218, 520653, 520654

Section 1R08: Inservice Inspection Activities 1R08 & 4OA5 (IP 71111.08)

Nondestructive Examination
NDE-3.1, Preparation, Issue and Control of NDE Procedures, Rev 14
NDE-4.1, Dominion Written Practice for Certification of Nondestructive Examination Personnel, Rev. 18
NDE-4.2, Dominion Written Practice for Certification of Ultrasonic Examination Personnel, Rev. 8
NDE-UT-803, Single or Two Sided Access Ultrasonic Exam of Austenitic Piping Welds, Rev. 2
NDE-7.5, General Requirements for ISI NDE
WQ-101, General Welder and Brazer Performance Qualification Procedures, Rev. 13
SSES-6.13, Controlling Procedure for Boric Acid Corrosion Control Program (BACCP), Rev. 5
2-OPT-RC-10.1, Reactor Coolant Leakage Walkdown at Cold Shutdown, Rev. 5
DNAP-1004, Boric Acid Corrosion Control (BACC) Program, Rev 2
2-NPT-RC-002, Inspection of Insulated Bolted Connections and principle Leak Locations, Rev. 0
0-NSP-RC-003, Visual Examination of Reactor Pressure Vessel Bottom Mounted Instrumentation (BMI), Rev. 1

Steam Generator
Procedure SRY-SGPMS-002, Rev. 9, Surry Site Specific Eddy Current Analysis Guidelines
Framatome-ANP Procedure ANATEC-08, Rev. 18, Certification of NDT Personnel
Areva Procedure 54-ISI-24-28, Written Practice for Personnel Qualification in Eddy Current Examination
Areva Procedure 54-ISI-400-13, Multi-Frequency Eddy Current Examination of Tubing, July 19, 2004

Other Documents
Welding Technique Sheet (WTS) 801, Revision 7
Examination Technique Specification Sheets

Dominion Steam Generator Monitoring and Inspection Plan, Surry Units 1 and 2, Rev. 0, October 2003
Framatome-ANP Eddy Current Inspection Plan, Surry Power Station Unit 2, EoC19/REOC15, April 2005
Calculation SG2CHCAL0001 & SG2CHCAL0035 for Tubes R31C28 & R32C28
Calculation SG2CHCAL0011 & SG2CHCAL0038 for Tubes R8C12 & R9C15
Calculation SG2CHCAL0001 & SG2CHCAL0002 for Tubes R35C22 & R35C17
Calculation SG2CHCAL0035 for Tubes R35C17, R35C73, R36C70, and R37C36
S/G Monitoring Program Pre-Outage Assessment, Surry Unit 2, Spring 2005

Corrective Action Documents (Problem Investigation Process [PIP])
Plant Issue-S-2005-2144, Liquid Penetrant Indication on Low Pressure Safety Injection Pump Casing Weld

Section 1R12: Maintenance Effectiveness

Plant Procedures
NES Materials Engineering Laboratory Materials Analysis Report dated September 3, 2002 (NESML-Q-498)
Calculation evaluating SW Chiller 3" Lines (CE-1790)
Calculation evaluating SW Chiller 3" Lines (CE-1783)
Request for Engineering Assistance No 2005-0014
Design Change Package 02-020
ET-S-2000-201
ET-S-2000-0206
REA 2004-0119 Rev 2
REA 2004-0014

Plant Issues
S-2000-0417, S-2000-1867, S-2000-1921, S-2001-3650, S-2002-2352, S-2002-0553, S-2002-1181, S-2002-1455, S-2002-1484, S-2003-4371, S-2003-2020, S-2004-2935, S-2005-0768, S-2005-0890, S-2005-1507

Plant Drawings
11448-FM-071D, Sheet 2 of 2

Work Orders
425533-01, 432287-01, 468117-01, 468117-03, 490710-01, 498494-01, 517235-05, 528521-01, 528251-03

Section 1R19: Post-Maintenance Testing

Plant Drawing 113E243A

Section 1R20: Refueling and Outage Activities

Plant Procedures
2-GOP-2.1, Unit Shutdown, Power Decrease from Allowable Power to Less Than 30% Reactor Power
2-GOP-2.2, Unit Shutdown, Less Than 30% to HSD
2-GOP-2.3
2-GOP-2.4, Unit Shutdown, HSD to 351EF
2-GOP-2.5, Unit Cooldown 351EF to Less Than 205EF
2-GOP-2.6, Unit Cooldown, Less than 205EF to Ambient
2-OP-FH-001, Controlling Procedure for Refueling
STA-OI-22, CSD/RSD Defense in Depth Risk Assessment
STA-OI-26, Calculation of Time to Core Boiling
2-GOP-1.1, Unit Startup, RCS Heatup From Ambient to 195EF
2-GOP-1.4, Unit Startup, HSD to 2% Reactor Power
2-OP-RX-009, Dilution to Critical Conditions Following Refueling Outage
2-NPT-RX-008, Startup Physics Testing

Plant Drawings
11448-FM-71B
11548-FM-68A
11548-FM-89A
11548-FE-1D
11548-FE-1F
11548-FE-1L
11548-FE-1M

Tagouts
2-05-FW-0007, Replace Unit 2 Motor Driven Auxiliary Feedwater Pump, 2-FW-P-3B
2-05-FW-0011, Turbine Driven Auxiliary Feedwater Pump, 2-FW-P-2
2-05-SI-0001, ISI Inspection of 2-SI-P-1B
2-05-SI-0004, FE-200A Outlet to Cold Leg Checkvalve
2-05-SW-0007A, Replace Strainer 02-SW-S-2A
2-05-SW-0014, Recirculation Spray Motor Operated Valves

Section 2OS1: Access Control To Radiologically Significant Areas

Procedures, Instructions, Guidance Documents, and Operating Manuals
Health Physics (HP)-1071.020, Controlling Contaminated Material, Revision (Rev.) 4
C-HP-1031.022, RWP Dosimetry: Exposure Control Support, Rev. 9
C-HP-1032.061, High Radiation Area Key Control, Rev. 2
C-HP-1032.060, Radiological Posting and Access Control, Rev. 1
C-HP-1081.010, Radiation Work Permits: Preparation and Approving, Rev. 7
Radiation Protection Job Guidelines, Number 105, Fuel Movement During Core Offload & Onload, Rev. 3
Radiation Work Permit 05-2-3004, U2 RFO: Fuel Movement Activities and Tri-Nuc Filter

Operations, Rev. 0
Radiation Work Permit 05-2-3119, U2 RFO: Cnmt-27' Clean, Inspect, and Coat Bare Metal Liner, Includes All Support Craft, Rev. 0
Radiation Work Permit 05-2-3502, U2 RFO: Outage Radiological Protection Support Work, Includes HP Tech Job Coverage, Surveying and Monitoring, Chemistry Sampling and RP Walkdowns and Inspections, Rev. 0
Radiation Work Permit 05-2-3508, U2 RFO: 2-RC-R-2, Reactor Disassembly/Re-Assembly, Rev. 0
Radiation Work Permit 05-2-3509, U2 RFO: 2-RC-R-2, Rx Head & Upper Internals Removal and Replacement, Rev. 0
Radiation Work Permit 05-2-3514, U2 RFO: 2-RC-R-2, Lower Internal Removal and Re-Install, Rev. 1
Radiation Work Permit 05-2-3515, U2 RFO: Steam Generator Primary Side Maintenance, Rev. 0

Records and Data Reviewed
Surry Spent Fuel Pool Inventory Sheet
High Radiation Area Gate Checklist

Corrective Action Program (CAP) Documents
Plant Issue S-2004-0111, U/2 Containment Entry to Troubleshoot/Repair “C” Incore Detector Drive System Was Aborted when Team Member Received a DAD Dose Rate Alarm
Plant Issue S-2004-0159, Personnel Radiation Exposure Management System (PREMS) Allowed a Worker to Issue a DAD Without the Required Briefing
Plant Issue S-2004-0686, Individual Received a PAM “Rate Alarm” while Performing Work in a High Radiation Area Behind Gate 14
Plant Issue S-2004-0798, To Document Challenges to the PREMS from Data Transferred from Newly-Installed Programs (LMS, ID Point, and OHM)
Plant Issue S-2004-1015, To Document NEI/NRC Discussions to Clarify Guidance of Regulatory Guide 8.38, Control of Access to High and Very High Radiation Areas in Nuclear Power Plants
Plant Issue S-2004-2359, Worker Received a DAD Does Rate Alarm While Deconning Inside the 1-CH-FL-5 Filter Bunker
Plant Issue S-2004-3235, Higher than Expected Dose Rates Identified on RWR Piping Outside of the Resin Collection Tank Rooms
Plant Issue S-2004-4531, DMC-2000, Number 200731, Failed to Perform As Designed While Being Used by a Worker in Unit 1 Containment

Section 2OS2: ALARA Planning and Controls

Procedures, Manuals, and Guides
VPAP-2102, Station ALARA Program, Rev. 11

ALARA Documents and Records
2004 Annual ALARA Report
Surry Unit 1 and 2 Steam Generator Channel Head Dose Rates (1980-2003)
Surry Unit 1 and 2 EPRI Loop Piping Average Dose Rates

Surry Unit 2 Refueling Total High Energy Gamma Activity, 04/2005
Surry Station ALARA Goals, 12/15/04
Surry ALARA Committee Meetings Minutes, 03/08/05
Surry ALARA Committee Meetings Minutes, 03/14/05
Surry ALARA Committee Meetings Minutes, 03/31/05
Surry 2004 Dose Report By Departments, 04/07/05

Temporary Shielding Plans:
Surry 2005 Unit 2 Refueling Outage Temporary Shielding Plan, 04/28/05
Temporary Shielding Request, Unit 2, Incore Sump Room Dog House, 11/20/04
Temporary Shielding Request, Unit 2, Incore Thimble Tubes, 04/20/05
Temporary Shielding Request, Unit 2, Containment A&B RHR Pumps, Piping, Heat Exchangers and RHR Flats Floor, 11/19/04
Temporary Shielding Request, Unit 2, Containment -3'6" Elevation, RHR Flats Handrail Shield Wall, 11/19/04
Temporary Shielding Request, Unit 2, Reactor Coolant Pump Motor Cube: Grading, RCP Kick Plate and Shield Wall, 11/19/04
Temporary Shielding Request, Unit 2, Reactor head and Shield Wall, 01/05/05
Temporary Shielding Request, Unit 2, Water Shields For Lower Internals Move, 12/22/04

Review of Job Packages for U1 RFO, 2004, including ALARA Evaluation, RWP, Pre-Job ALARA Worksheet, TEDE ALARA Evaluation, ALARA Action Plan, Work in Progress ALARA Review, RWP ALARA Re-Evaluation, and Post-job Review as appropriate:

ALARA Evaluation # 04-014, “U1 RFO: Rx Head and Upper Internals Removal and Replacement”, RWP 04-2-2509
ALARA Evaluation # 04-013, “U1 RFO Reactor Disassembly/Reassembly”, RWP 04-2-2508
ALARA Evaluation # 04-019, “U1 RFO: Insulation and Scaffold Outage Related Activities”, RWP 04-2-2507
ALARA Evaluation # 04-021, “U1 RFO: 1-RC-P-A1,B,C Maintenance”, RWP 04-2-2101
ALARA Evaluation #04-010, “U1 RFO: Outage Radiological Protection Support”, RWP 04-2-2502
ALARA Evaluation # 04-029, “U1 RFO: 1 RC-R-1 Remove and Reinstall Lower Internals”, RWP 04-2-2514
ALARA Evaluation #04-038, “U1 RFO: Internals Lift Rig Repairs”, RWP 04-2-2123

Pre-Job ALARA Reviews for U2 RFO, 2005:
ALARA Evaluation # 05-007, “U2 RFO: Install and Remove Scaffold”, RWP 05-2-3507
ALARA Evaluation # 05-027, “U2 RFO: Valves, Pumps, and Piping Maintenance”, RWP 05-2-3105
ALARA Evaluation # 05-012, “U2 RFO: Reactor Disassembly/Reassembly”, RWP 05-2-3508
ALARA Evaluation # 05-009, “U2 RFO: RP Support”, RWP 05-2-3502
ALARA Evaluation # 05-015, “U2 RFO: Operations Support and Testing”, RWP 05-2-3503

Post-Job ALARA Reviews for U2 RFO, 2005:
ALARA Evaluation # 05-023, “U2 RFO: 10 year ISI Inspection”, RWP 05-2-3012.

Surry Power Station ALARA Committee Minutes: 5/13/04, 8/19/04, 10/7/04, 11/12/04, 11/24/04, 12/9/04, 3/8/05, 3/14/05, and 3/31/05

CAP Documents
Audit 04-08, Radiation Protection and Process Control Program, 5/20/04

Section 2PS2: Radioactive Material Processing and Transportation

Procedures, Manuals, and Guides

VPAP-2104, Radioactive Waste Process Control Program (PCP), Rev. 5
ROP-1.03, Processing Liquid Waste by Thermex Reverse Osmosis System and/or LW Demineralizer using the DCS, Rev. 011
ROP-1.88, Thermex Reverse Osmosis Unit Startup, Rev. 008
ROP-2.03, Waste Transfer and Pretreatment, Rev. 008
HP-1072.030, Computer Programs for Radwaste and Radioactive Material, Rev. 2

Shipping Records and Radwaste Data

B2004-3, Dewatered Mechanical Filters, 4/14/04
G2004-4, Surry U1 CRDM Box, 6/24/04
R2004-3, Surry U2 Intact Reactor Pressure Vessel Head with CRDMs, 10/12/04
G2004-8, EBT Brine, 12/15/04
B2005-2, Denatured Resin, 2/24/05
SH-2005-016, RVISI Equipment, 5/12/05
SH-2005-017, RVISI Minisub, 5/17/05

10 CFR Part 61 Radioactive Waste Stream Analysis Reports: Letdown Filter, Liquid Waste Collection Tank, Reactor Coolant Filter, Spent Fuel Pool Skimmer Filters, Seal Water Injection Filters, Tri-Nuc Filters, Reverse Osmosis Filter, Blend Tank, DAW (September 2004 - January 2005)
SCAL Data for Letdown Filters to Determine Scaling Factors, December 2004
CoC No. 9168, Model No. CNS 8-120B Shipping Package
Memo to file dated 8/5/04 from Supervisor of RMC, Regarding Radioactive Material Control Assignments, Including IATA Retraining Conducted 6/3/04

Plant Issues

S-2003-0162R8, Solid Radioactive Waste Program Evaluation, January 2002-September 2003
S-2004-0659, Three Sealand Containers Have Deteriorated to the Point They Do Not Meet Criteria to be Classified As Strong Tight Containers, 2/18/04
S-2004-0965, Approximately 5 Gallons of Rusty Colored Liquid Leaked from the Door Seal of Contaminated Scaffold Sealand #6 in the Yard RCA, 3/12/04
S-2004-1541, Two Spent Letdown Filters were Determined to Exceed the 10CFR61 Limits for Radioactive Waste Disposal, 4/8/04
S-2005-1295, Skimmer Filter 1-FC-FL-1A has been Characterized as Greater than Class C and not Suitable for Burial, 3/24/05

Section 4OA1: Performance Indicator Verification

Procedures, Guidance Documents and Manuals
Health Physics Surveillance Procedure, 0-HSP-RM-003, Dose Contributions from Station Effluents, Revision 5

Records and Data
2003 Annual Radioactive Effluent Release Report
2004 Annual Radioactive Effluent Release Report
Monthly Liquid and Gaseous Effluent Dose Reports: July 2004 through March 2005
Monthly Assessments for Occupational Exposure PI: July 2004 through March 2005
Search of Corrective Action Program documents for Individual RWP Access Records for Exit Doses Exceeding 100 mrem: July 2004 through March 2005
Plant Issue S-2004-1208, Calculation Error in Tritium Release in February 2004 Liquid Effluents

Section 4OA2: Identification and Resolution of Problems

Plant Issues
S-2000-0417, S-2000-1867, S-2000-1921, S-2001-3650, S-2002-2352, S-2002-0553, S-2002-1181, S-2002-1455, S-2002-1484, S-2003-4371, S-2003-2020, S-2004-2935, S-2005-0768, S-2005-0890, S-2005-1507

Section 4OA5: Other Activities

Independent Spent Fuel Storage Installation (ISFSI)
C-HP-1032.080, Controlled Area and Unrestricted Area Radiological Surveys, Rev. 6
0-HPT-ISFSI-001, Independent Spent Fuel Storage Installation (ISFSI) Radiological Surveillance - Quarterly, performed 1/5/05, 10/9/04, 7/12/04, 4/8/04, 1/5/04, 9/30/03, 7/2/03, 4/1/03, and 1/3/03.
0-HPT-ISFSI-001, Independent Spent Fuel Storage Installation (ISFSI) Radiological Surveillance - Spent fuel cask loaded and placed at ISFSI, performed 3/24/04, 7/29/03, 7/16/03, 2/13/03, and 2/4/03.

Transportation of Reactor Control Rod Drives in Type A Packages
G2004-4, Surry U1 Control Rod Drive Mechanism (CRDM) Box, 6/24/04
R2004-3, Surry U2 Intact Reactor Pressure Vessel Head with CRDMs, 10/12/04