



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

August 2, 2017

Mr. Daniel Stoddard
Senior Vice President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

**SUBJECT: SURRY POWER STATION – NRC INTEGRATED INSPECTION REPORT
05000280/2017002 AND 05000281/2017002**

Dear Mr. Stoddard:

On June 30, 2017, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Surry Power Station, Units 1 and 2. On July 12, 2017, the NRC inspectors discussed the results of this inspection with Mr. F. Mladen and other members of your staff. The inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented 1 finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violations or significance of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Surry Power Station.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC Resident Inspector at the Surry Power Station.

D. Stoddard

2

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Anthony D. Masters, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos.: 50-280, 50-281
License Nos.: DPR-32, DPR-37

Enclosure:
IR 05000280/2017002, 05000281/2017002
w/Attachment: Supplemental Information

cc: Distribution via ListServ

D. Stoddard

3

SUBJECT: SURRY POWER STATION – NRC INTEGRATED INSPECTION REPORT
05000280/2017002 AND 05000281/2017002 August 2, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-280, 50-281

License Nos.: DPR-32, DPR-37

Report No: 05000280/2017002, 05000281/201002

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: Surry Power Station, Units 1 and 2

Location: 5850 Hog Island Road
Surry, VA 23883

Dates: April 1, 2017 through June 30, 2017

Inspectors: P. McKenna, Senior Resident Inspector
N. Day, Acting Senior Resident Inspector
C. Jones, Resident Inspector
A. Butcavage, Reactor Inspector (1R08)
R. Carrion, Senior Reactor Inspector (1R08)
C. Dykes, Health Physicist (2RS1)
W. Loo, Senior Health Physicist (2RS8)

Approved by: Anthony D. Masters, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000280/2017002, 05000281/2017002; 04/01/2017-06/30/2017; Surry Power Station Units 1 and 2: Flood Protection Measures.

The report covered a 3-month period of inspection by resident inspectors and region-based inspectors. One NRC identified finding was identified and determined to be a non-cited violation (NCV) of very low safety significance. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process", dated April 29, 2015. The cross-cutting aspect was determined using IMC 0310, "Components Within The Cross-Cutting Areas" dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

Cornerstone: Mitigating Systems

- **Green.** An NRC-identified, NCV of Surry Technical Specification (TS) 6.4.A.7 was identified because the mechanical equipment room (MER) 5 flood dike was not installed in accordance with the manufacturer's installation procedures after it was removed for maintenance. Specifically, work order (WO) 38103734871, procedure GMP-013, "Removal and Installation of Flood Protection Dikes and Secondary Flood Shields and Placing MER 3 in Extended Access," Revision 22, and drawing 11548-FC-6L, Flood Protection Dike Details MER 5 Turbine Building Unit 2, Revision 0, did not provide instructions, procedures, or drawing specifics that took into account the manufacturer instructions of using epoxy to ensure a water tight seal; and failed to use the materials as listed in drawing 11548-FC-6L during the reinstallation of MER 5 flood dike. The issue was documented in the licensee's corrective action program (CAP) as condition reports (CR) 1068357, 1068357, and 1068528.

The inspectors determined that not having and following work instructions and drawings appropriate to the reinstallation of MER 5 flood dike is a performance deficiency (PD). This PD is more than minor because it is associated with the protection against external factors attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, on May 2, 2017, the licensee failed to ensure WO 38103734871, procedure GMP-013, and drawing 11548-FC-6L had detailed manufacturer instructions to use epoxy to ensure a water tight seal and failed to use the materials as listed in drawing 11548-FC-6L. Using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19, 2012, and IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined that the finding was of very low safety significance (Green) because the finding is a deficiency affecting the design or qualification of a mitigating structure, system, or component (SSC), in this case the main control room (MCR) chillers in MER 5, in which the SSC in question maintained its operability. This finding has a cross-cutting aspect in the area of human performance associated with teamwork, in that, individuals and work groups failed to communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. Specifically, while preparing for and performing

MER 5 flood dike reinstallation using WO 38103734871, procedure GMP-013, and drawing 11548-FC-6L, the licensee utilized a new foam material, but the different departments in the organization (specifically Supply, Engineering, and Maintenance) failed to work together to evaluate the supplied manufacturer material and any specific requirements needed for installation (H.4). (Section 1R06)

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near rated thermal power (RTP) through the inspection period.

Unit 2 operated at or near RTP from the beginning of the inspection period until May 6, 2017, when it was shutdown to begin a planned refueling outage (RFO). It remained offline until June 4, 2017, when the main turbine was synchronized to the grid. On June 7, 2017, the unit reached RTP and operated there for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

.1 Review of Summer Readiness of Offsite and Alternate AC Power Systems

- a. The inspectors verified that plant features, and procedures for operation and continued availability of offsite and alternate alternating current (AAC) power systems, were appropriate. The inspectors reviewed the licensee's procedures affecting those areas, and the communications protocols between the transmission system operator and the nuclear power plant to verify that the appropriate information was exchanged when issues arose that could impact the offsite power system. The inspectors evaluated the readiness of the offsite and AAC power systems by reviewing CRs and open WOs; and walking down portions of the AC power systems including the 500 kilovolt (kV) and 220 kV switchyards. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors performed a site specific weather related inspection due to anticipated adverse weather conditions, specifically for the tornado watch in effect on April 6, 2017. The inspectors reviewed the licensee's preparations for potential severe weather as well as severe weather procedure 0-OP-ZZ-021, "Severe Weather Preparation," Revision 17. The inspectors walked down site areas which included the electrical switchyard, emergency diesel generators, emergency switchgear rooms, emergency service water pump house, and the turbine, safeguards, and auxiliary buildings. During the walkdown, the inspectors looked for loose items and/or debris that could become a missile hazard during high winds, verified flooding barriers were available and/or in place, and verified that the emergency equipment was available and in the required standby mode. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial Walkdown

a. Inspection Scope

The inspectors conducted 3 equipment alignment partial walkdowns to evaluate the operability of selected redundant trains or backup systems, listed below, with the other train or system inoperable or out of service. The inspectors reviewed the functional systems descriptions, Updated Final Safety Analysis Report (UFSAR), system operating procedures, and TS to determine correct system lineups for the current plant conditions. The inspectors performed walkdowns of the systems to verify that critical components were properly aligned and to identify any discrepancies which could affect operability of the redundant train or backup system. Documents reviewed are listed in the Attachment.

- "B" and "C" emergency service water (ESW) pumps while "A" ESW pump was out of service for an engine cooling line replacement
- Electrical alignment of MCR chillers "A", "B" and "D" while the "C" and "E" MCR chillers were out of service
- #3 emergency diesel generator (EDG) following monthly performance testing

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

The inspectors performed a detailed walkdown and inspection of the Unit 2 low head safety injection system (LHSI) to verify the systems were properly aligned and capable of performing their safety function, and to assess their material condition. During the walkdown, the inspectors verified breaker positions were in the proper alignment, component labeling was accurate, hangers and supports were functional, and local indications were accurate. Recent testing history was also reviewed to verify that standby components were performing within their design. The plant health report, system drawings, condition reports, the UFSAR, and TSs were reviewed and outstanding deficiencies were verified to be properly classified and not affect system operability and capability to perform its safety function. The inspectors reviewed the corrective action program to verify equipment alignment issues were being identified and resolved. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Quarterly Fire Protection Reviews

a. Inspection Scope

The inspectors conducted tours of the 5 areas listed below that are important to reactor safety to verify the licensee's implementation of fire protection requirements as described in fleet procedures CM-AA-FPA-100, "Fire Protection/Appendix R (Fire Safe Shutdown) Program," Revision 13, CM-AA-FPA-101, "Control of Combustible and Flammable Materials," Revision 8, and CM-AA-FPA-102, "Fire Protection and Fire Safe Shutdown Review and Preparation Process and Design Change Process," Revision 8. The reviews were performed to evaluate the fire protection program operational status and material condition and the adequacy of: (1) control of transient combustibles and ignition sources; (2) fire detection and suppression capability; (3) passive fire protection features; (4) compensatory measures established for out-of-service, degraded or inoperable fire protection equipment, systems, or features; and (5) procedures, equipment, fire barriers, and systems to endure post-fire capability to safely shutdown the plant. The inspectors reviewed the CAP to verify fire protection deficiencies were being identified and properly resolved. Documents reviewed are listed in the Attachment.

- AAC Diesel
- ESW Pump Room
- Unit 2 Containment
- Fire Pump House
- Unit 1 and Unit 2 Station Battery Rooms

b. Findings

No findings were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors reviewed the internal flood protection measures and procedural controls established to address potential flooding in the Unit 1 and 2 turbine buildings and MER 5 during the MER 5 flood barrier removal and reinstallation. The inspectors conducted a walkdown of the affected areas to observe and assess the condition of the installed flood dikes, floor drain backflow preventers, the sealing of holes and penetrations between flood areas, the adequacy of water tight doors, the operability of flooding alarms, and the installed sump pumps. The inspectors reviewed the documentation on previous flood mitigation modifications made to these areas and reviewed the corrective action program to verify internal flooding related problems were being identified and properly addressed. Documents reviewed are listed in the Attachment.

b. Findings

Introduction: An NRC-identified Green, NCV of Surry TS 6.4.A.7 was identified because the MER 5 flood dike was not installed in accordance with the manufacturer's installation procedures after it was removed for maintenance. Specifically, WO 38103734871, procedure GMP-013, "Removal and Installation of Flood Protection Dikes and Secondary Flood Shields and Placing MER 3 in Extended Access," Revision 22, and drawing 11548-FC-6L, "Flood Protection Dike Details MER 5 Turbine Building," Revision 0, did not provide instructions, procedures, or drawing specifics that took into account the manufacturer instructions of using epoxy to ensure a water tight seal; and failed to use the materials as listed in drawing 11548-FC-6L during the reinstallation of MER 5 flood dike.

Description: On May 2, 2017, the licensee used WO 38103734871, GMP-013, and drawing 11548-FC-6L to remove and reinstall the MER 5 flood dike. MER 5 contains MCR chillers and the MER 5 flood dike is required for turbine building flooding protection of MER 5 as discussed in the UFSAR section 9.10.4.27.

The inspectors noted that work requirements to remove and reinstall the MER 5 flood dike were provided in sequence number 40 in WO 38103734871, and by instructions listed in procedure GMP-013. Upon review of the procedure, the inspectors did not see instructions specific to the MER 5 flood dike. Based on the written work instructions, the MER 5 flood dike did not have clear and direct work steps for reinstallation.

Furthermore, the inspectors noted that, in the field, the licensee was constructing the MER 5 flood dike with drawing 11548-FC-6L, which was not listed in WO 38103734871 or procedure GMP-013.

The inspectors reviewed the manufacturer published instructions for the flood dike. According to the vendor documentation, "the manufacturer's published installation procedures shall be followed at all times." However, on May 2, 2017, the licensee failed to reinstall the MER 5 flood dike in accordance with manufacturer published instructions. Specifically, the licensee failed to use epoxy during the installation, which ensures that the seal will be water tight, consistent with vendor documentation. Not following the manufacturer's installation procedure caused a reasonable doubt of operability of the MER 5 MCR chillers. The inspectors noted that WO 38103734871, procedure GMP-013, and drawing 11548-FC-6L did not have epoxy listed as a required material. The inspectors also noted that drawing 11548-FC-6L specified using Evazote sealant for the flood dike jointed connections, however; Metazeal and Phyzite were used during the work. This was the first time the licensee had to remove and reinstall this flood dike since it was first installed in 1993.

The licensee generated CRs 1068357, 1068357, and 1068528 to address the difference in the material stated on the drawing and what was used for actual construction of the MER 5 flood dike, as well as the lack of using epoxy during construction. The licensee evaluated the current application of the MER 5 flood dike in ETE-SU-2017-0044, "Evaluation of MER 5 Flood Wall Insulation Design." In this engineering technical evaluation (ETE), the licensee determined that Metazeal and Phyzite sealants are the equivalent of Evazote sealant. The ETE also came to a preliminary conclusion that the current bolted configuration of the flood dike provides reasonable assurance that the joint will remain water tight during flooding events if epoxy is not used in the installation

of the dike. Corrective action (CA) 2057635 will further address this issue and identify the preferred, long term configuration to be used for the MER 5 flood dike.

Analysis: Not having and following work instructions and drawings appropriate to the reinstallation of MER 5 flood dike is a PD. This PD is more than minor because it is associated with the protection against external factors attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, on May 2, 2017, the licensee failed to ensure WO 38103734871, procedure GMP-013, and drawing 11548-FC-6L had detailed manufacturer instructions to use epoxy to ensure a water tight seal and failed to use the materials as listed in drawing 11548-FC-6L. Using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," and IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined that the finding was of very low safety significance (Green) because the finding is a deficiency affecting the design or qualification of a mitigating SSC, in this case the MCR chillers in MER 5, in which the SSC in question maintained its operability.

This finding has a cross-cutting aspect in the area of human performance associated with teamwork, in that, individuals and work groups failed to communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. Specifically, while preparing for and performing MER 5 flood dike reinstallation using WO 38103734871, procedure GMP-013, and drawing 11548-FC-6L, the licensee utilized a new foam material, but the different departments in the organization (specifically Supply, Engineering, and Maintenance) failed to work together to evaluate the supplied manufacturer material and any specific requirements needed for installation. [H.4]

Enforcement: Surry Technical Specification 6.4.A.7 requires, in part, that "detailed written procedures with appropriate instructions shall be provided for conditions that include: preventative or corrective maintenance operations which would have an effect on the safety of the reactor." Removal and installation of the MER 5 flood protection dikes is implemented by Surry procedure GMP-013, "Removal and Installation of Flood Protection Dikes and Secondary Flood Shields and Placing MER 3 in Extended Access". Contrary to the above, on May 2, 2017, the licensee did not have the appropriate instructions for the removal and installation of the MER 5 flood control dike; therefore causing a reasonable doubt of operability of the MER 5 MCR chillers. Specifically, the licensee failed to have the manufacturer instructions to use epoxy to ensure a water tight seal on the MER 5 flood dike in procedure GMP-013 and failed to use the materials as listed in drawing 11548-FC-6L. Because the finding was of very low safety significance and entered into the licensee's corrective action program as CRs 1068357, 1068357, and 1068528, this finding is being treated as a non-cited violation consistent with Section 2.3.2.a. of the NRC Enforcement Policy: NCV 05000280, 281/2017002-01, "Failure to Have Work Instructions Impacting MER 5 Flood Barrier."

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the "B" and "C" recirculation spray heat exchangers to determine their readiness and availability. The inspectors reviewed the system data

maintained by the system engineer, maintenance rule information, specific commitments, and design basis information. The inspectors reviewed testing procedures and inspection results, including the results from the flow test conducted during the May 2017 RFO, to confirm that the “B” and “C” recirculation spray heat exchangers were still able to perform their function and that planned corrective actions were appropriate. The inspectors verified that significant heat exchanger performance issues were being entered into the licensee’s CAP and appropriately addressed. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities:

From May 8 to 16, 2017, the inspectors conducted an onsite review of the implementation of the licensee’s inservice inspection (ISI) program for monitoring degradation of the reactor coolant system, emergency feedwater systems, risk-significant piping and components, and containment systems in Unit 2. The inspectors’ activities included a review of non-destructive examinations (NDEs) to evaluate compliance with the applicable edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI (Code of Record: 2004 Edition; 5th Interval, 1st Period, 2nd Outage), and to verify that indications and defects (if present) were appropriately evaluated and dispositioned in accordance with the requirements of the ASME Code, Section XI, acceptance standards.

The inspectors directly observed the following NDEs mandated by the ASME Code to evaluate compliance with the ASME Code Section XI and Section V requirements; and if any indications and defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code, or an NRC-approved alternative requirement.

- Ultrasonic examination of component 11548-WMKS- RC-E-2 / 2-RC-10NIR, Nozzle to Vessel Inside Radius, Class 1
- Ultrasonic examination of component 11548-WMKS- RC-E-2 / 2-RC-11NIR, Nozzle to Vessel Inside Radius, Class 1
- Magnetic Particle Testing (MT) of component 11548-WMKS-0102G1 / 14-WFPD-109 / H001-1 through -4, integral attachments (lugs) on piping, Class 2
- Visual testing (VT-1) of the concrete floor-to-containment liner interface of all identified surface areas in the containment building basement in accordance with ASME XI, Table IWE-2500-1, Item No. E4.11

The inspectors reviewed the welding documents for the activities referenced below in order to evaluate compliance with procedures and the ASME Code. Specifically, the inspectors reviewed the WO, including the weld data sheets, welding procedures, procedure qualification records, and welder performance qualification records.

- 02-RC-PCV-2455B-Valve, Replace Unit 2 Spray Valve from Loop "C", ASME Class 1, reviewed WO 38103517618
- 02-FW-PP-14.00-WFPD PIPE-117-601, Replace "A" FW Containment Piping, ASME Class 2, reviewed WO 38103513368
- SW Piping Replacement for 02-CH-E-5A, ASME Class 3, reviewed WO 38103385860

During non-destructive surface and volumetric examinations performed since the previous refueling outage, the licensee did not identify any relevant indications that were analytically evaluated and accepted for continued service. Therefore, no NRC review was completed for this inspection procedure attribute.

Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities:

For the Unit 2 vessel head, a bare metal visual examination was required this RFO, pursuant to 10 CFR 50.55a (g)(6)(ii)(D), as it had not been performed since November 2012 during RFO S2R24. The examination identified no evidence of penetration leakage through the reactor head, or base material degradation on the surface of the reactor head.

Boric Acid Corrosion Control Inspection Activities:

The inspectors reviewed the licensee's boric acid corrosion control (BACC) program activities to ensure implementation with commitments made in response to NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary," and applicable industry guidance documents. Specifically, the inspectors performed an onsite record review of procedures and the results of the licensee's containment walkdown inspections performed during the current spring RFO (S2R27). The inspectors also interviewed the BACC program owner, conducted an independent walkdown of containment to evaluate compliance with licensee's BACC program requirements, and verified that degraded or non-conforming conditions such as boric acid leaks, were properly identified and corrected, in accordance with the licensee's BACC and CAPs.

The inspectors reviewed the following CRs and associated corrective actions related to evidence of boric acid leakage to evaluate if the corrective actions completed were consistent with the requirements of the ASME Code Section XI and 10 CFR Part 50, Appendix B, Criterion XVI.

- CR 1020054, Boric Acid on 2-RC-MOV-2587 Collar and Packing Leakoff Line
- CR 1051161, Boric Acid Found on 2-SI-MOV-2860B
- CR 1061147, Boric Acid on 2-CH-FCV-2122 (Packing)

Steam Generator Tube Inspection Activities:

The inspectors observed the following activities and/or reviewed the following documentation, and evaluated them against the licensee's TS, commitments made to the NRC, ASME Section XI, and Nuclear Energy Institute (NEI) 97-06 (Steam Generator Program Guidelines):

- Reviewed the licensee's in-situ steam generator (SG) tube pressure testing screening criteria. No tubes required plugging this outage. In particular, the inspectors assessed whether assumed NDE flaw sizing accuracy was consistent with data from the Electric Power Research Institute examination technique specification sheets or other applicable performance demonstrations.
- Compared the numbers and sizes of SG tube flaws/degradation identified against the licensee's previous outage Operational Assessment.
- Reviewed the SG tube eddy current testing (ECT) examination scope and expansion criteria.
- Evaluated if the licensee's SG tube ECT examination scope including potential areas of tube degradation identified in prior outage SG tube inspections and/or as identified in NRC generic industry operating experience applicable to the licensee's SG tubes.
- Reviewed the licensee's implementation of its extent-of-condition inspection scope and repairs for new SG tube degradation mechanisms. No new degradation mechanisms were identified during the eddy current (EC) examinations.
- Reviewed the licensee's repair criteria and processes.
- Verified that primary-to-secondary leakage (e.g., SG tube leakage) was below 3 gallons per day, or the detection threshold, during the previous operating cycle according to licensee procedures.
- Evaluated if the ECT equipment and techniques used by the licensee to acquire data from the SG tubes were qualified or validated to detect the known/expected types of SG tube degradation in accordance with Appendix H, "Performance Demonstration for Eddy Current Examination, of Electric Power Research Institute Pressurized Water Reactor Steam Generator Examination Guidelines," Revision 7.
- Observed licensee's secondary side SG foreign object search and removal activities associated with SG "C".
- Observed and discussed resolution analyst dispositions for 5 steam generator tubes.
- Reviewed a sample of ECT personnel qualifications.
- Reviewed the Condition Monitoring and Operational Assessment Report tabulating the results of the Steam Generator inspections performed during this (spring 2017) RFO.

Identification and Resolution of Problems:

The inspectors performed a review of a sample of ISI-related problems that were identified by the licensee and entered into the CAP as CRs. The inspectors reviewed the CRs to confirm that the licensee had appropriately described the scope of the problem, and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the report attachment.

a. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program

.1 Resident Inspector Quarterly Review

a. Inspection Scope

The inspectors observed and evaluated a licensed operator simulator exercise given on May 6, 2017. The scenario involved “Just-in-Time” training for the Unit 2 RFO and involved a reactor shutdown, draining of reactor coolant to flange level, fill of the feedwater header and preparations for starting a main feedwater pump, and reactor startup at the end of the RFO. The inspectors observed the crew’s performance to determine whether the crew met the scenario objectives; accomplished the critical tasks; demonstrated the ability to take timely action in a safe direction and to prioritize, interpret, and verify alarms; demonstrated proper use of alarm response, abnormal, and emergency operating procedures; demonstrated proper command and control; communicated effectively; and appropriately classified events per the emergency plan. The inspectors observed the post training critique to determine that weaknesses or improvement areas revealed by the training were captured by the instructor and reviewed with the operators. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2 Resident Inspector Observation of Control Room Operations

a. Inspection Scope

During the inspection period, the inspectors conducted observations of licensed reactor operator activities to ensure consistency with licensee procedures and regulatory requirements. For the following activities, the inspectors observed the following elements of operator performance: (1) operator compliance and use of plant procedures including technical specifications; (2) control board component manipulations; (3) use and interpretation of plant instrumentation and alarms; (4) documentation of activities; (5) management and supervision of activities; and (6) control room communications.

- On April 12, 2-OPT-RX-005, “Control Rod Assembly Partial Movement Testing,” Revision 35
- On May 6, 2-GOP-2.7, “Unit Shutdown, Power Decrease from Allowable Power to Unit Offline for Refueling Outage,” Revision 35

b. Findings

No findings were identified.

1R12 Maintenance Effectivenessa. Inspection Scope

For the 2 equipment issues described in the CRs listed below, the inspectors evaluated the effectiveness of the corresponding licensee's preventive and corrective maintenance. The inspectors performed a detailed review of the problem history and associated circumstances, evaluated the extent of condition reviews, as required, and reviewed the generic implications of the equipment and/or work practice problem(s). Inspectors performed walkdowns of the accessible portions of the system, performed in-office reviews of procedures and evaluations, and held discussions with system engineers. The inspectors compared the licensee's actions with the requirements of the Maintenance Rule (10 CFR 50.65), station procedures ER-AA-MRL-10, "Maintenance Rule Program," Revision 6, and ER-AA-MRL-100, "Implementing Maintenance Rule," Revision 11. Documents reviewed are listed in the Attachment.

- CR1070173, Instrument air leak downstream of 2-IA-796
- CR1057046, Unit 1 "C" safety injection accumulator reactor coolant system (RCS) in-leakage past valves 1-SI-145 and 1-SI-147

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Controla. Inspection Scope

The inspectors evaluated, as appropriate, the 4 activities listed below for the following: (1) the effectiveness of the risk assessments performed before maintenance activities were conducted; (2) the management of risk; (3) that, upon identification of an unforeseen situation, necessary steps were taken to plan and control the resulting emergent work activities; and, (4) that maintenance risk assessments and emergent work problems were adequately identified and resolved. The inspectors verified that the licensee was complying with the requirements of 10 CFR 50.65(a)(4) and the data output from the licensee's safety monitor associated with the risk profile of Units 1 and 2. The inspectors reviewed the CAP to verify deficiencies in risk assessments were being identified and properly resolved. Documents reviewed are listed in the Attachment.

- On April 4, Unit 1 and Unit 2 risk during a tornado watch.
- On April 7, Unit 1 and Unit 2 risk during a tornado watch.
- Unit 2 RFO 27 shutdown risk review report.
- On June 13, Unit 1 and Unit 2 risk during emergent troubleshooting of the Unit 2 feedwater regulating valve while the site was in a "Hot Weather Alert" and the Unit 1 TDAFW pump was out of service for a performance test.

b. Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the 6 operability evaluations listed below, affecting risk-significant mitigating systems, to assess as appropriate: (1) the technical adequacy of the evaluations; (2) whether continued system operability was warranted; (3) whether other existing degraded conditions were considered; (4) if compensatory measures were involved, whether the compensatory measures were in place, would work as intended, and were appropriately controlled; and (5) where continued operability was considered unjustified, the impact on TS limiting conditions for operation and the risk significance. The inspectors' review included verification that operability determinations were made as specified in OP-AA-102, "Operability Determination," Revision 15. The inspectors reviewed the licensee's corrective action program to verify deficiencies in operability determinations were being identified and corrected. Documents reviewed are listed in the Attachment.

- CR 1067349, Excessive time response of canal level probe, 1-CW-LE-103
- CR 1068761, 2B2 uninterruptible power supply (UPS) failed to 2B DC bus load during 2B1 UPS battery charger tagout
- CR 1065966, 2-EP-MCC-2H1-2N/S-SWGEAR and 2-EP-MCC-2J1-2N/S-SWGEAR motor control centers equipment qualification for environmental conditions
- CR 1069943, Fire hose debris contribution to containment sump loading during containment accident scenarios
- CR1070497, RCS through-wall leak upstream of 2-SS-HCV-202C
- EDG #3 during tornado atmospheric conditions

b. Findings:

No findings were identified.

1R18 Plant Modifications

Permanent Modification

a. Inspection Scope

The inspectors reviewed the completed permanent plant modification design change package (DCP) SU-13-01223, "AAC EDG Starting Air Modifications." The inspectors conducted walkdowns of the installation at various stages of completion, reviewed the 10 CFR 50.59 Safety Review/Regulatory Screening, technical drawings, test plans and the modification package to assess the TS implications. The inspectors also verified that the permanent modification was in accordance with licensee procedure CM-AA-DDC-201, "Design Changes," Revision 20. In addition, the inspectors reviewed calculations and conducted interviews with licensee personnel. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed 7 post maintenance test procedures and/or test activities for selected risk-significant mitigating systems listed below, to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and/or engineering personnel; (2) testing was adequate for the maintenance performed; (3) acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, range, and accuracy consistent with the application; (5) tests were performed as written with applicable prerequisites satisfied; (6) jumpers installed or leads lifted were properly controlled; (7) test equipment was removed following testing; and (8) equipment was returned to the status required to perform in accordance with VPAP-2003, "Post Maintenance Testing Program," Revision 14. Documents reviewed are listed in the Attachment.

- 2-OPT-CH-003, "Charging Pump Operability and Performance Test for 2-CH-P-1C," Revision 59, on the Unit 2 "C" charging pump after the performance of a maintenance package.
- 0-OPT-VS-001, "Control Room Air Conditioning System Pump and Valve Inservice Testing," Revision 45, after MCR chiller service water pump motor replacement.
- 2-OPT-FW-002, "Motor Driven Auxiliary Feedwater Pump Performance Test," Revision 38 (OTO-1), Motor Driven Auxiliary Feedwater Pump 2-FW-P-3B after lube oil tubing replacement.
- 2-OPT-ZZ-002, "ESF Actuation with Undervoltage and Degraded Voltage - 2J Bus," Revision 36 (OTO-3), after 2J bus outage.
- 1-PT-18.8A, "Charging Pump Component Cooling Performance Test," Revision 26, after pump preventative maintenance was completed.
- 0-NAT-E-007, "Checkout of Electric Motors - Uncoupled Operation," Revision 2, after Unit 2 "C" RCP motor replacement.
- 2-OP-FW-001, "Motor Driven AFW Pumps Startup and Shutdown," Revision 13, after Unit 2 "B" MDAFW pump motor maintenance.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 2 RFO (2R27), which was conducted May 6, 2017, through June 4, 2017. The inspectors confirmed that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. The inspectors used IP 71111.20, "Refueling and Outage Activities," to observe portions of the maintenance and startup activities to verify that the licensee maintained defense-in-depth commensurate with the outage risk plan

and applicable TS. The inspectors monitored licensee controls over the outage activities listed below. Documents reviewed are listed in the Attachment.

- Licensee configuration management, including daily outage reports, to evaluate maintenance of defense-in-depth commensurate with the outage risk plan for key safety functions and compliance with the applicable TS when taking equipment out of service.
- Implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing.
- Controls over the status and configuration of electrical systems to ensure that TS and outage safety plan requirements were met, and control over switchyard activities.
- Controls over activities that could affect reactivity.
- Monitoring of decay heat removal operations.
- Spent fuel cooling 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.
- Reactor coolant inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss.
- The control of containment penetrations and containment entries to verify that the licensee controlled those penetrations and activities in accordance with the appropriate TS and could achieve/maintain containment closure for required conditions.
- Refueling activities, including fuel handling and fuel receipt inspections.
- Fatigue management.
- Startup and ascension to full power operation, tracking of startup prerequisites, and walkdown of the primary containment to verify that debris had not been left which could block emergency core cooling system strainers.
- Licensee identification and resolution of problems related to RFO activities.

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the 7 surveillance tests listed below, the inspectors examined the test procedures, witnessed testing, or reviewed test records and data packages, to determine whether the scope of testing adequately demonstrated that the affected equipment was functional and operable, and that the surveillance requirements of TS were met. The inspectors also determined whether the testing effectively demonstrated that the systems or components were operationally ready and capable of performing their intended safety functions. Documents reviewed are listed in the Attachment.

In-Service Testing:

- 1-OPT-FW-003, "Turbine Driven Auxiliary Feedwater Pump 1-FW-P-2 Performance Test," Revision 52

Surveillance Testing:

- 1-PT-2.33A, "Emergency Bus Undervoltage and Degraded Protection Test "H" Train," Revision 7
- 2-OSP-SW-008, "Recirculation Spray Heat Exchanger Full Flow Test," Revision 6 (OTO-1)
- 0-ECM-0306-02, "Motor Control Center Maintenance," Revision 61, testing of thermal overload protection system for the "C" MCR chiller SW pump motor
- 1-OPT-SI-005, "LHSI Pump Test," Revision 32
- 0-NSP-ZZ-001, "Boroscope Inspection of CLS, RP, and SI Cabinet Relays," Revision 0

Appendix J Leak Rate Determination:

- 2-OPT-CT-201, "Containment Isolation Valve Local Leak Rate Testing (Type C Containment Testing)," Revision 21, 2-CV-TV-250C, Containment vacuum pump 1A suction isolation trip valve leak test.

b. Findings

No findings were identified.

1EP6 Drill EvaluationEmergency Preparedness (EP) Drilla. Inspection Scope

On June 27, 2017, the inspectors reviewed and observed licensee EP drill involving a fire in the #1 EDG room, a SG tube rupture, fuel element failure, steam line break on the "A" SG upstream of the main steam isolation valve and an unisolable radioactive air release. The inspectors assessed the licensee emergency procedure usage, emergency plan classifications, notifications, and protective actions recommendation development. The inspectors evaluated the adequacy of the licensee's conduct of the drill and post-drill critique performance. The inspectors verified that the drill critique identified drill performance weaknesses and entered these items into the licensee's CAP. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2. RADIATION SAFETY (RS)

2RS1 Radiological Hazard Assessment and Exposure Controls (7 Samples)a. Inspection Scope

Hazard Assessment and Instructions to Workers: During facility tours, the inspectors directly observed radiological postings and container labeling for areas established within the radiologically controlled area (RCA) of the auxiliary building, Unit 2

containment, outside areas and radioactive waste (radwaste) processing and storage locations. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCAs. The inspectors reviewed survey records for several plant areas including surveys for airborne radioactivity, gamma surveys with a range of dose rate gradients, surveys for alpha-emitters and other hard-to-detect radionuclides, and pre-job surveys for upcoming tasks. The inspectors also discussed changes to plant operations that could contribute to changing radiological conditions since the last inspection. The inspectors attended pre-job briefings and reviewed Radiation Work Permit (RWP) details to assess communication of radiological control requirements and current radiological conditions to workers.

Control of Radioactive Material: The inspectors observed surveys of material and personnel being released from the RCA using small article monitor, personnel contamination monitor, and portal monitor instruments. The inspectors discussed equipment sensitivity, alarm setpoints, and release program guidance with licensee staff. The inspectors also reviewed records of leak tests on selected sealed sources and discussed nationally tracked source transactions with licensee staff.

Hazard Control: The inspectors evaluated access controls and barrier effectiveness for selected High Radiation Area (HRA), Locked High Radiation Area (LHRA), and Very High Radiation Area (VHRA) locations and discussed changes to procedural guidance for LHRA and VHRA controls with Radiation Protection (RP) supervisors. The inspectors reviewed implementation of controls for the storage of irradiated material within the spent fuel pool. Established radiological controls, including airborne controls and electronic dosimeter alarm setpoints, were evaluated for selected SG tasks, resin transfer activities and other Unit 2 RFO tasks. In addition, the inspectors reviewed licensee controls for areas where dose rates could change significantly as a result of plant shutdown and refueling operations. The inspectors also reviewed the use of personnel dosimetry, including extremity dosimetry and multi-badging in high dose rate gradients.

Radiation Worker Performance and RP Technician Proficiency: Occupational workers' adherence to selected RWPs and RP technician proficiency in providing job coverage were evaluated through direct observations, review of job packages, and interviews with licensee staff. Jobs reviewed included SG work and reactor head assembly work in high radiation and contaminated areas. The inspectors also evaluated worker responses to dose and dose rate alarms during selected work activities.

Problem Identification and Resolution: The inspectors reviewed and assessed CRs associated with radiological hazard assessment and control. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with licensee procedures. The inspectors also reviewed recent self-assessment results.

Inspection Criteria: RP activities were evaluated against the requirements of UFSAR Section 11, Technical Specifications (TS) Sections 6.4, 10 CFR Parts 19 and 20, and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE Circular 81-07, "Control of Radioactively Contaminated Material". Documents and records reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (6 Samples)

a. Inspection Scope

Radioactive Material Storage: The inspectors walked down indoor and outdoor areas inside the protected area as well as the Surry Radwaste Facility (SRF). During the walk-downs, the inspectors observed the physical condition and labeling of storage containers and the radiological postings for satellite radioactive material storage areas. The inspectors also reviewed the licensee's radwaste procedures for routine surveys and waste storage.

Radioactive Waste System Walkdown, Characterization and Classification: The inspectors walked down accessible sections of the liquid and solid radwaste systems to assess material condition and conformance of equipment with system design diagrams. This included the indoor portion of the SRF containing radwaste storage tanks, resin transfer piping, resin and filter packaging components; and abandoned evaporator equipment. The inspectors discussed the function of radwaste components with the radwaste operator. The inspectors discussed possible changes to the radwaste processing systems with radwaste staff. The processes for the dewatering of resins, spent resin tank recirculation, resin sampling, and transfer of resins from the processing pads to the shipping casks and temporary storage casks were reviewed and discussed with radwaste personnel.

The inspectors reviewed the 2015 and 2016 Radioactive Effluent Release Reports and the 2015 - 2016 radionuclide characterization and classification for the dry active waste and dewatered resin waste streams. The inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined quality assurance comparison results between licensee waste stream characterizations and outside laboratory data. The inspectors also evaluated how changes to plant operational parameters were taken into account in waste characterization.

Shipment Preparation and Records: There were no radioactive material shipments available for observation during the week of the inspection. The inspectors reviewed 5 shipping records for consistency with licensee procedures and compliance with NRC and Department of Transportation regulations. This included review of emergency response information, waste classification, radiation survey results, information on the waste manifest, and the authorization of the receiving licensee to receive shipments. Training records for selected individuals currently qualified to ship radioactive material were reviewed for compliance with 49 CFR Part 172 Subpart H.

Problem Identification and Resolution: The inspectors reviewed CRs associated with radwaste/shipping. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria: Radioactive material and waste storage activities were reviewed against the requirements of 10 CFR Part 20. Radwaste processing activities and

equipment configuration were reviewed for compliance with the licensee's Process Control Program. 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 (1983). Transportation program implementation was reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 71 (which requires licensees to comply with Department of Transportation regulations in 49 CFR Parts 107, 171-180, and 390-397), as well as the guidance provided in NUREG-1608. Training activities were assessed against 49 CFR Part 172 Subpart H. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems (MSs), Barrier Integrity, Emergency Preparedness, Public Radiation Safety, and Occupational Radiation Safety

40A1 Performance Indicator (PI) Verification

.1 Safety System Functional Failures

a. Inspection Scope

The inspectors reviewed the licensee's submittals for the Safety System Functional Failures performance indicators for both Unit 1 and Unit 2 (2 samples) for the period of April 1, 2016, through March 31, 2017, to assess the accuracy and completeness of the submitted data and whether the performance indicators were calculated in accordance with the guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspection was conducted in accordance with NRC Inspection Procedure 71151, "Performance Indicator Verification." The inspectors reviewed the applicable NRC inspection reports and the licensee's event reports, operator logs, station performance indicators, and related CRs. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2 RCS Specific Activity and RCS Leak Rate

a. Inspection Scope

The inspectors reviewed the licensee's submittals for the RCS specific activity and RCS leak rate performance indicators for both Unit 1 and Unit 2 for the period of April 1, 2016 through March 31, 2017 (4 samples) to assess the accuracy and completeness of the submitted data and whether the performance indicators were calculated in accordance with the guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspection was conducted in accordance with NRC Inspection Procedure 71151, "Performance Indicator Verification." The inspectors also

reviewed control room logs of daily RCS leakage, and compared that information to the data reported by the performance indicator. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified

4OA2 Identification and Resolution of Problems

.1 Daily Reviews of items Entered into the Corrective Action Program:

a. Inspection Scope

As required by NRC 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 CAP. This review was accomplished by reviewing daily CR report summaries and periodically attending daily CR review team meetings.

b. Findings

No findings were identified.

.2 Annual Sample: Review of CR 1064874 Corrective Actions for the "C" MCR Chiller SW Pump Mechanical Seal Leak

a. Inspection Scope

The inspectors performed a review regarding the licensee's assessments and corrective actions associated with CR 1064874. This sample was selected because of the safety importance of the main control room chillers, and because the inspectors noted unplanned unavailability of the system for several weeks in April, 2017. The inspectors focused on the licensee's determination of the cause, and any precursor that could have prevented the unplanned unavailability of the system.

b. Findings and Observations

No findings were identified. On February 21, 2017, the licensee identified a leaking mechanical seal on the 1-VS-P-1C, main control room chiller C service water pump. The licensee documented this issue in CR 1060533. Per the licensee's CAP, the issue was assigned as a level 3 (routine) issue, which is a condition adverse to quality. The inspectors noted that there was no corrective action to monitor the leakage between when the issue was identified until the final corrective action to replace the degraded pump seal, which was scheduled for August 22, 2017.

On April 10, 2017, licensee personnel noticed an abnormal noise in the area of 1-VS-P-1C, and generated CR1064874. The licensee evaluated the noise and vibrations and determined that the vibration levels were in the danger category. Operations declared 1-VS-P-1C inoperable and removed it from service for repairs. The pump motor was replaced and returned to operable status on April 21, 2017.

The licensee performed an equipment apparent cause evaluation and determined that the excessive seal leakage traveled up the shaft, contaminating the motor bearing and caused extremely high vibrations. Furthermore, the licensee determined that the seal degraded earlier than expected due to the highly brackish SW. As a result of the equipment apparent cause evaluation, Surry Engineering took an action (CA3057504) to submit a request for engineering assistance to evaluate the possibility of changing the system pump type to match the charging SW pumps to reduce the risk of excessive mechanical seal leakage. The inspectors noted that pumps with similar seal design and in a SW application are still susceptible to this type of seal degradation, but have no signs of immediate degradation (e.g. leakage, high vibrations, and/or noise).

The inspectors also noted that the "B" MCR chiller SW pump, had a degraded mechanical seal (approximately 200 mL/min leakage) in June of 2016. On March 28, 2016, Surry identified that the "B" MCR chiller SW pump had a degraded mechanical seal that was leaking approximately 30 mL/min leakage, and wrote CR1031999. On June 15, 2016, NRC inspectors identified that the seal leakage increased from 30 to 200 mL/min, and in July of 2016, the licensee replaced "B" MCR chiller SW pump motor at the same time the pump was replaced. The inspectors noted "B" MCR chiller SW pump degraded seal was very similar to the "C" MCR chiller SW pump degraded seal leakage identified on April 10, 2017. However, after discussion with Surry Engineering, the June 15, 2016, 1-VS-P-1B degraded seal issue was attributed to improper installation, and not seal material compatibility with the SW system.

Overall, the inspectors determined that a more thorough evaluation of the impact of the leaking (degraded) seal could have been performed in February 2017. Specifically, while the organization did identify the issue, assign significance, and plan final resolution, the organization failed to evaluate the effect of the issue onto other components (seal failing casing bearing degradation) before the system was in an unplanned inoperable status. However, the inspectors determined that there was not a PD, because the licensee did not have enough of a direct correlation between leakage and its impact on the 1-VS-P-1C pump motor to foresee and correct, before unplanned unavailability occurred.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On July 12, 2017, the inspection results were presented to Mr. F. Mladen and other members of his staff, who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

L. Baker, Training Manager
T. Cuthriell, Licensing Engineer
B. Garber, Manager, Station Licensing
M. Haduck, Manager, Outage and Planning
R. Herbert, Manager, Nuclear Systems Engineering
J. Henderson, Manager, Nuclear Design Engineering
P. Jurewicz, Boric Acid Control Plan Site Owner
R. Jones, Manager, Protection Services
R. Johnson, Manager, Operations
D. Lawrence, Director, Station Safety and Licensing
K. Longston, Manager, Emergency Preparedness
T. Mayer, Dominion Engineering, SG Program Owner
K. Mitchell, ISI Program Owner
F. Mladen, Site Vice President
L. Ragland, Manager, Radiological Protection and Chemistry
J. Rosenberger, Director, Station Engineering
R. Simmons, Plant Manager
R. Scanlan, Manager, Nuclear Organizational Effectiveness
W. Terry, Supervisor HP Technical Services
E. Turko, ISI Supervisor
D. Valdivieso, Reactor Containment Building Engineer
T. Vo, Dominion Nuclear Engineering
D. Wilson, Manager, Maintenance
C. Wray, NDE Coordinator

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000280, 281/2017002-01	NCV	Failure to Have Work Instructions Impacting MER 5 Flood Barrier (Section 1R06)
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

0-AP-37.01, Abnormal Environmental Conditions, Rev. 69
0-OP-ZZ-021, Severe Weather Preparation, Rev. 17
0-OSP-ZZ-003, Hot Weather Preparation, Rev. 7
1-OP-26.5, 230 KV Switchyard Voltage, Rev. 18
2-OP-26.5, 500 KV Switchyard Voltage, Rev. 21

Condition Reports

1064508

Work Orders

38103748634

Section 1R04: Equipment Alignment

Procedures

0-OP-EG-001A, EDG 3 System Alignment, Rev. 15
0-OP-SW-002A, Emergency Service Water System Alignment, Rev. 9
0-OP-VS-006, Control Room and Relay Room Ventilation System, Rev. 72
0-OP-VS-006A, Control Room and Relay Room Ventilation System Alignment, Rev. 13
2-AP-27.00, Loss of Decay Heat Removal Capability, Rev. 28
2-OP-SI-001A, Safety Injection System Alignment, Rev. 15

Condition Reports (*NRC Identified)

*1064163 1066450 *1068210 *1068360 *1069128 *1071984
1072525

Drawings

11448-FE-19AJ SH 1, Elementary Diagram Emergency Diesel Generator No. 3 Battery Charger
3-EE-BC-EG3, Rev. 14
11448-FE-19AJ SH 2, Elementary Diagram Emergency Diesel Generator No. 3 Battery Charger
3-EE-BC-EG3, Rev. 0
11448-FM-071A SH 1, Flow/Valve Operating Numbers Diagram Circulating and Service Water
System Unit 1, Rev. 12
11448-FM-071E, Flow/Valve Operating Numbers Diagram Service Water Fuel Oil System
Unit 1, Rev. 12
11548-FM-086A, Flow/Valve Operating Numbers Diagram Reactor Coolant System, Rev. 39
11548-FM-089B, Flow/Valve Operating Numbers Diagram Safety Injection System, Rev. 35

Section 1R05: Fire Protection

Procedures

CM-AA-FPA-100, Fire Protection/Appendix R (Fire Safe Shutdown) Program, Rev. 11
0-LSP-FP-045, Fire Extinguisher Annual Maintenance, Rev. 2
0-FS-FP-198, Diesel Fire Pump Room Elevation 27 Feet – 6 Inches, Rev. 2
0-FS-FP-199, Electric Fire Pump Room Elevation 27 Feet – 6 Inches, Rev. 3
0-FS-FP-211, Emergency Service Water Pump House – Low Level Elevation 18 Feet, Rev. 3
0-FS-FP-225, Alternate AC Diesel Room – Construction Site Elevation 35 FT, Rev. 1
1-FS-FP-109, Battery Room 1A Elevation 9 Feet – 6 Inches, Rev. 3

1-FS-FP-110, Battery Room 1B Elevation 9 Feet – 6 Inches, Rev. 1
 2-FS-FP-109, Battery Room 2A Elevation 9 Feet – 6 Inches, Rev. 3
 2-FS-FP-110, Battery Room 2B Elevation 9 Feet – 6 Inches, Rev. 3
 2-FS-FP-134, Containment Unit 2 Elevation 47 Feet – 4 Inches (Subatmospheric), Rev. 1
 2-FS-FP-135, Containment Unit 2 Elevation 18 Feet – 4 Inches (Subatmospheric), Rev. 1
 2-FS-FP-136, Containment Unit 2 Elevation (-)3 Feet – 6 Inches (Subatmospheric), Rev. 1
 2-FS-FP-137, Containment Unit 2 Elevation (-)27 Feet – 7 Inches (Subatmospheric), Rev. 1

Condition Reports (*NRC Identified)

1063878 *1072030

Drawings

11448-FAR-210, Equipment Location – Appendix ‘R’ Intake Structure Plan – EL. 18’-0” Unit 1, Rev. 8
 11448-FAR-212, Equipment Location – Appendix ‘R’ Fire Pump House – EL. 27’-0” Unit 1, Rev. 7

Section 1R06: Flood Protection

Condition Reports (*NRC Identified)

*1064439 *1068129 *1068148 *1068357 *1068528 *1069860
 *1069872 *1071914 *1071798

Work Orders

WO38103734871, WO38103807538

Other Documents

Attachment 2 of NF-AA-PRA-370, Site Specific PRA Guidance for Risk Factors, Rev. 17
 Attachment 1 of 0-OP-VS-006, Operable Combination [of Control Room Chillers] Determination, Rev. 72
 Brock Peterson (Chase Corp.) Email to Dominion Engineering 5/12/2017
 Brock Peterson (Chase Corp.) Letter to Dominion Engineering 5/10/2017
 ETE-SU-2017-0044, Evaluation of MER 5 Flood Wall Installation Design, Rev. 0

Section 1R07: Heat Sink Performance

Condition Reports

1069655

Other Documents

Heat Exchanger Inspection Forms, ER-AA-HTX-1002 for 02-RS-E-1B and 1C, 05/09/17

Section 1R08: Inservice Inspection Activities

Procedures

2-OPT-RC-10.0, Surry Power Station, Operations Periodic Test, Reactor Coolant Leakage-Computer Calculated, Section 6.4, Primary to Secondary Leak Rate Verification, Rev. 4
 ER-AA-NDE-MT-200, ASME Section XI Magnetic Particle Examination Procedure, Rev. 4
 ER-AA-NDE-UT-705, Ultrasonic Examination Procedure of Vessel Nozzle Inside Radius Sections, Rev. 4

ER-AA-NDE-VT-604, Visual Examination (VE) for Leakage of PWR Reactor Head Penetrations, Rev. 2
 ER-AA-NDE-VT-605, IWE Visual Examination Procedure, Rev. 0
 ER-AP-BAC-10, Boric Acid Corrosion Control Program, Rev. 12
 ER-AP-BAC-101, Boric Acid Corrosion Control Program (BACCP) Inspections, Rev. 12
 ER-AP-BAC-102, Boric Acid Corrosion Control Program (BACCP) Evaluations, Rev. 13
 ER-AP-SGP-101, Dominion Administrative Procedure, Steam Generator Program, Rev. 11
 NS-WKI-000006, BWX-Technologies Mechanical Tube Plug & Stabilizer Installation for RSGs, Rev. 9
 SRY-SGPMS-002, Surry Site Specific Eddy Current Analysis Guidelines - Surry 2R27, Rev. 25

Condition Reports (*NRC Identified)

CR 1067669, 2-IC-G9 Has Evidence of Potential Previous BA Leak
 CR 1067687, 2-RH-ICV-3038 Swagelok Plug Is Leaking <1 dpm Estimated
 CR 1067777, 2-CP-DM-1D Outlet Nozzle Requires Repair
 CR 1067780, Nozzle of 2-CP-DM-1A Needs to Be Repaired
 CR 1067781, Nozzle of 2-CP-DM-1B Needs to Be Repaired
 CR 1067782, 2-CP-DM-1E Outlet Nozzle Requires Repair
 CR 1067842, Loose Turnbuckle Locknut on 2-RC-R-1 Seismic Tie Rod Assembly
 CR 1067845, Nozzle of 2-CP-DM-1G Needs To Be Repaired
 CR 1067904, Low UT Readings Found on the 02-RS-E-1B Outlet Vent Line
 CR 1067908, Low UT Readings Found on the 02-RS-E-1C Outlet Vent Line
 CR 1068120, Spring Hanger Settings Found Out of Tolerance
 CR 1068123, Spring Hanger Settings Found Out of Tolerance
 CR 1068145, Boric Acid on 2-CH-314 Packing
 CR 1068146, Boric Acid on 2-CH-311 Packing
 CR 1068179, Degraded Liner Coating in the U2 Containment Sump Concrete-Liner Interface
 CR 1068523, Loose Part Identified in the Secondary Side of Steam Generator (SG) "C"
 CR 1068905, U2 BMV Exam – Relevant Condition at 180 Degrees of Penetration 61
 CR 1068906, U2 BMV Exam – FME (Washer) Was Observed in the Annulus of Penetration 68
 *CR 1069151, Appendix H Document Had Typographical Error, 5/18/17

Welder Documentations

WO 38103385860, SW Piping Replacement for 02-CH-E-5A, ASME Class 3
 Certification Records of NDE personnel
 Procedure Qualification Record 3404
 Procedure Qualification Record 3405
 Procedure Qualification Record 3416
 Procedure Qualification Record 3417
 Records of Welder Performance Qualification Tests for welding personnel
 Repair/Replacement Plan 2015-096
 Liquid Penetrant Examination Report BOP-PT-15-246 of Welds 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15 & 16
 Liquid Penetrant Examination Report BOP-PT-16-103 of Welds 1 & 5A
 Liquid Penetrant Examination Report BOP-PT-16-104 of Weld 11
 Liquid Penetrant Examination Report BOP-PT-16-105 of Welds 17, 18A & 19A Final
 Welding Technique Sheet for Welding Technique Number 3403, Rev. 7
 WO 38103517618, Replace Unit 2 Pressurizer Spray Valve from Loop "C", 02-RC-PCV-2455B-Valve, ASME Class 1

Certification Records of NDE personnel
 Procedure Qualification Record 801, Rev. 2
 Procedure Qualification Record 830
 Procedure Qualification Record 831

Records of Welder Performance Qualification Tests for welding personnel

Repair/Replacement Plan 2015-124
 Radiography Report NDE-R-15-258 of Weld Joint #2-38
 Radiography Report NDE-R-15-258 of Weld Joint #2-39
 Liquid Penetrant Examination Report BOP-PT-15-306 of Welds 2-24A & 2-25A FINAL
 Liquid Penetrant Examination Report BOP-PT-15-369 of Welds 2-38 & 2-39
 Liquid Penetrant Examination Report BOP-PT-15-385 of Weld 2-39
 Liquid Penetrant Examination Report BOP-PT-15-386 of Weld 2-39 (R1-Base Metal Repair)
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