



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

October 26, 2016

Mr. David A. Heacock  
President  
Virginia Electric and Power Company  
Innsbrook Technical Center  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

**SUBJECT: SURRY POWER STATION – NRC INTEGRATED INSPECTION REPORT  
05000280/2016003 AND 05000281/2016003**

Dear Mr. Heacock:

On September 30, 2016, the Nuclear Regulatory Commission (NRC) completed an inspection at your Surry Power Station, Units 1 and 2. On October 12, 2016, the NRC inspectors discussed the results of this inspection with Mr. L. Lane and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one 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 Enforcement Policy.

If you contest the violation or significance of the 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 Regional Administrator, Region II, and the NRC Resident Inspector at the Surry Power Station.

D. Heacock

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 05000280/2016003, 05000281/2016003  
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

DISTRIBUTION:  
See next page

D. Heacock

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 05000280/2016003, 05000281/2016003  
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

DISTRIBUTION:  
See next page

DOCUMENT NAME: G:\DRP\RPB5\SURRY\REPORTS\2016\2016-003\SURRYIR2016-003.DOCX  
ADAMS ACCESSION NUMBER: ML16300A287

<input checked="" type="checkbox"/> SUNSI Review Complete By: Son Ninh		ADAMS <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		Keyword: Sunsu Review Complete	
OFFICE	RII:DRP	RII:DRP	RII:DRP	RII:DRP	RII:DRP	RII:DRP			
NAME	PMcKenna	CJones	BBishop	SNinh	AMasters				
SIGNATURE	PJM3 via email	CDJ1 via email	BDB3 via email	SON	ADM2				
DATE	10/18/2016	10/18/2016	10/20/2016	10/19/2016	10/25/2016				

**OFFICIAL RECORD COPY**

D. Heacock

3

Letter to David A. Heacock from Anthony D. Masters dated October 26, 2016

SUBJECT: SURRY POWER STATION – NRC INTEGRATED INSPECTION REPORT  
05000280/2016003 AND 05000281/2016003

**DISTRIBUTION:**

S. Maxey, RII

M. Kowal, RII

OE Mail

RIDSNNRRDIRS

PUBLIC

RidsNrrPMSurry Resource

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 50-280, 50-281

License Nos.: DPR-32, DPR-37

Report No: 05000280/2016003, 05000281/2016003

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: Surry Power Station, Units 1 and 2

Location: 5850 Hog Island Road  
Surry, VA 23883

Dates: July 1, 2016 through September 30, 2016

Inspectors: P. McKenna, Senior Resident Inspector  
C. Jones, Resident Inspector  
B. Bishop, Reactor Inspector (4OA2)

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

Enclosure

## SUMMARY

IR 05000280/2016003, 05000281/2016003; 07/01/2016-09/30/2016; Surry Power Station Units 1 and 2: Maintenance Effectiveness.

The report covered a three-month period of inspection by resident inspectors and region-based inspectors. One self-revealing finding was identified which was 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" (SDP), dated April 29, 2015. The cross-cutting aspects were 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 February 4, 2015. 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. A self-revealing, non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI was identified because the licensee failed to promptly identify a condition adverse to quality associated with the material condition of the "B" Emergency Service Water (ESW) pump diesel cooling water outlet valve, 1-SW-3. Specifically, the "B" ESW pump diesel cooling water outlet piping flange downstream of 1-SW-3 was found cracked on April 7, 2016. While repairing the cracked pipe flange, the licensee discovered that the fasteners on one baseplate for the 1-SW-3 seismic supports were severed by corrosion. A material deficiency with the second 1-SW-3 seismic support was identified by the NRC in August, 2014. The current issue was documented in the licensee's corrective action program (CAP) as Condition Report (CR) 1033107.

The inspectors determined that failure to identify a condition adverse to quality associated with the material condition of the "B" ESW pump piping was a performance deficiency (PD). Specifically, not having compensatory actions or periodic inspections of the 1-SW-3 support baseplates in place when there was a known material condition that caused these baseplates to become periodically wetted by service water (SW), inhibited the licensee's ability to detect that the assumptions in the engineering evaluation, which proved that the two supports remained fully qualified for all design basis loading conditions, had become invalid. The inspectors determined that the PD was more than minor because it was associated with the equipment performance 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. Using IMC 0609.04, Initial Characterization of Findings, Table 2, dated June 19, 2012, IMC 0609 Appendix A, "Significance Determination Process (SDP) for Findings at-Power," dated June 19, 2012, and Exhibit 4 of Appendix A, "External Events Screening Questions", the inspectors determined that a detailed risk evaluation was required because the finding assumed that the safety function of the "B" ESW pump was unavailable and represented a degradation to one train of a system that supports a risk significant system. A Senior Reactor Analyst performed a bounding risk evaluation by using the Surry Standardized Plant Analysis Risk (SPAR) model and failing the "B" ESW pump for a year. The additional risk of the "B" and "C" pumps out simultaneously for a limited exposure time, and the "A" and "B" pumps for a similar limited exposure time were added to the result.

The delta-Core Damage Frequency (CDF) due to the performance deficiency was determined to be  $6.3E-8$  (Green). This finding has a cross-cutting aspect in the evaluation component of the problem identification and resolution area (P.2), because the organization did not thoroughly evaluate issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, the license did not institute periodic inspections of the 1-SW-3 supports when conditions were present that could challenge the assumptions of their design basis loading. (Section 1R12)

## REPORT DETAILS

### Summary of Plant Status

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

Unit 2 operated at or near RTP throughout the inspection period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection

##### External Flooding

##### a. Inspection Scope

The inspectors performed an inspection of the external flood protection measures for Surry. The inspectors reviewed Technical Specification (TS), procedures, design documents, and the Updated Final Safety Analysis Report (UFSAR), which depicted the design flood levels and protection areas containing safety-related equipment to identify areas that may be affected by external flooding. The inspectors conducted a site walkdown of the turbine building, including doors, flood protection barriers, penetrations, and the integrity of the perimeter structure to ensure the licensee erected flood protection measures in accordance with design specifications. The inspectors also reviewed operating procedures for mitigating external flooding during severe weather to determine if the licensee planned or established adequate measures to protect against external flooding events.

##### b. Findings

No finding were identified.

#### 1R04 Equipment Alignment

##### Partial Walkdown

##### a. Inspection Scope

The inspectors conducted three 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, 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.

- Unit 2 "A" and "B" Motor Driven Auxiliary Feedwater (MDAFW) pumps while the Turbine Driven AFW pump was being tested.

- Unit 1 Charging (CH) pumps after the completion of maintenance on the Unit 1 “A” CH pump.
- Component Cooling (CC) system while the “C” CC pump was out of service for maintenance.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Quarterly Fire Protection Reviews

a. Inspection Scope

The inspectors conducted tours of the five 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 11, 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 7. 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 so that post-fire capability to safely shutdown the plant is ensured. The inspectors reviewed the corrective action program to verify fire protection deficiencies were being identified and properly resolved.

- “A” and “B” Emergency Diesel Generator (EDG) Fuel Oil Pumphouses
- #1 EDG Room
- Unit 2 Emergency Switchgear Room (ESGR) and Relay Room
- Unit 2 Cable Vault
- Fuel Handling Building

b. Findings

No findings were identified.

.2 Drill Observation

a. Inspection Scope

The inspectors observed an unannounced fire drill on September 15, 2016, that occurred in the Unit 1 cable spreading room. The drill was observed to evaluate the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions as required. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing

apparatus; (2) proper uses and layout of fire hoses; (3) employment of appropriate firefighting techniques; (4) sufficient firefighting equipment brought to the scene; (5) effectiveness of command and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives.

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 the emergency switchgear rooms while design change SU-15-01107, "Mechanical Equipment Rooms (MER) 3&4 Service Water Improvements", was being installed. This design change including the core drilling of holes between MER-3 and MER-4. The inspectors conducted a walk down 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. Additionally, the inspectors verified that the required compensatory actions required as part of the design change were being accomplished by the licensee.

b. Findings

No findings were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the "B" component cooling (CC) heat exchanger (HX) to determine its 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 to confirm that the "B" CCHX was still able to perform its 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.

b. 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 July 19, 2016. The scenario involved a failed "C" steam generator pressure sensor, loss of the "J" emergency bus, a small break loss of coolant accident inside containment resulting in a reactor trip, safety injection, a loss of offsite power with the #2 EDG tripped on overspeed, the alternate AC (AAC) diesel tripped, the #1 EDG output breaker tripped, and declaration of an alert. This scenario was intended to exercise the entire operations crew and assess the ability of the operators to react correctly to multiple failures. 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.

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 August 9, 2-PT-8.1, "Reactor Protection System Logic Periodic Test" during replacement of the Unit 2 S1 block auto shunt trip pushbutton.
- On September 12, 1-OPT-RX-005 and 2-OPT-RX-005, "Control Rod Assembly Partial Movement Testing" on Units 1 and 2, and 2-OSP-TM-004, "Unit 2 Turbine Trip Test"

b. Findings

No findings were identified.

## 1R12 Maintenance Effectiveness

### a. Inspection Scope

For the three equipment issues described in the condition reports listed below, the inspectors evaluated the effectiveness of the 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 problems. 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 10. Where applicable, the inspectors performed a quality control review of commercial grade dedications for items that are purchased commercial grade, and tested accordingly prior to installation into systems important to safety.

- CR 1033107, "B" ESW Pump Cracked Discharge Flange
- CR 1045354, Unit 1 "A" Reactor Trip Bypass Breaker Spurious Opening
- CR 1024316, Commercial Grade Dedication of Throttle Linkage Parts for the "C" ESW pump. (Quality Control Sample)

### b. Findings

Introduction: A self-revealing Green non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI was identified because the licensee failed to promptly identify a condition adverse to quality associated with the material condition of the "B" Emergency Service Water (ESW) pump diesel cooling water outlet valve, 1-SW-3. Specifically, the "B" ESW pump diesel cooling water outlet piping flange downstream of 1-SW-3 was found cracked on April 7, 2016. While repairing the cracked pipe flange, the licensee discovered that the fasteners on one baseplate for the 1-SW-3 seismic supports were severed by corrosion. A material deficiency with the second 1-SW-3 seismic support was identified by the NRC in August, 2014.

Description: On April 7, 2016, the "B" ESW pump diesel cooling water outlet valve flange (1-SW-3) was found to be cracked, and the pump was declared inoperable. Degradation (cracking) was noted on the fiberglass reinforced pipe flange in two areas. The 1-SW-3 valve was not level which appeared to be placing mechanical force on the flange due to an apparent seismic support level difference. The north support was raised at the valve and when inspected had corrosion under the baseplate. During flange and valve support repair activities, four bolts on the cooling water discharge valve support base plate were found to be failed due to corrosion. The cause of the support failure was corrosion of the base plate and anchor bolts from repetitive exposure to SW. The licensee replaced the fiberglass flanged section of piping, replaced the fasteners on both 1-SW-3 seismic supports, and the "B" ESW pump was declared operable on April 9, 2016. This issue was documented in the licensee's CAP as CR 1033107.

In August, 2014, during the NRC triennial heat sink inspection, an NRC inspector noted that a bolt was missing on the south support for 1-SW-3. This support already had one of the four bolts non-functional with a welded cap in place of the bolt. Surry engineering

performed an engineering technical evaluation (ETE) (ETE-SU-2014-0070) that calculated that having two of four bolts on the south support plate was acceptable, assuming that the other two south plate bolts were intact and that the north baseplate had no issues with its bolts. Photos taken of the two baseplates in August 2014, showed that there was corrosion underneath the north baseplate; however, the anchor bolts appeared to be intact.

Surry has had a long-standing issue with SW leakage pooling around the “B” ESW pump and base supports for 1-SW-3. One source of leakage was the “B” ESW pump packing and the other source continues to be the ESW pumps vent traps. These vent traps routinely fail to close when an ESW pump is started. The vent traps remove air from the ESW pump casing to provide cooling water to the upper bearings and packing. The automatic closing function of these vent traps has been historically unreliable and operator manual action is routinely required to isolate the trap. As a result, Surry was in the process of writing a design change to drain the vent traps into the intake bay, but the design change had not yet been completed.

In ETE-SU-2014-0070, engineering also recommended that the carbon steel bolts on the 1-SW-3 baseplates be replaced with stainless steel bolts. The work orders for these replacements were written and scheduled (with the earliest replacement scheduled for November 2014), but not executed. The deferral of the work relied on the ETE-SU-2014-0700 conclusion that two bolts on the south baseplate were acceptable. There was no compensatory measures or periodic inspections put into place to ensure that the supports remained in the state that was assumed in ETE-SU-2014-0700.

Surry has had recent issues with fiberglass piping cracking due to slight changes in piping supports as the supports are pushed up due to corrosion at the base of the support. As a result of fiberglass piping leaks in the charging (CH) SW system in Mechanical Equipment Rooms (MER) 3 and 4 and NRC violation 0500281/2015001-01, “Failure to Identify Charging Service Water Pipe Leak”, Surry has identified cracking in CH/SW piping during periodic walkdowns of the system. Quick Cause (QC) 3011947 identified that several of the leaks were near degraded or abandoned piping supports. The supports were pushing the pipes up, adding stress to the pipe, and causing it to crack.

The licensee conducted an apparent cause evaluation (ACE) on this issue and in the process of reviewing photographs from the August 2014, NRC identification of the missing support base fastener, concluded that there were indications on the 1-SW-3 downstream pipe flange in the area that the April 2016, cracks were discovered. An engineering past-operability review completed on May 11, 2016, determined that the piping and supports were non-functional for prior operability based on the potential for lateral displacement during a seismic event. Licensee Event Report (LER) 2016-001-00 was submitted pursuant to 10 CFR 50.73(a)(2)(v)(B), for operations prohibited by TS, and pursuant to CFR 50.73(a)(2)(v)(B), for an event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat. Based upon the engineering past-operability review, an exposure time for the inoperability of the “B” ESW pump due to a seismic event was assumed to be one year.

Analysis: The inspectors determined that failure to identify a condition adverse to quality associated with the material condition of the “B” ESW pump piping was a performance deficiency (PD) that was within the licensee’s ability to foresee and correct. Specifically, not having compensatory actions or periodic inspections of the 1-SW-3 support baseplates in place when there was a known material condition that caused these baseplates to become periodically wetted by SW, inhibited the licensee’s ability to detect that the assumptions in the engineering evaluation, which proved that the two supports remained fully qualified for all design basis loading conditions, had become invalid. The lack of periodic inspections became more critical when the maintenance to replace the bolting on the baseplates was deferred three times between November 2014 and October 2015. The inspectors determined that the PD was more than minor because it was associated with the equipment performance 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.

Using IMC 0609.04, Initial Characterization of Findings, Table 2, dated June 19, 2012, IMC 0609 Appendix A, “SDP for Findings at-Power,” dated June 19, 2012, and Exhibit 4 of Appendix A, “External Events Screening Questions”, the inspectors determined that a detailed risk evaluation was required because the finding assumed that the safety function of the “B” ESW pump was unavailable and represented a degradation to one train of a system that supports a risk significant system. A Senior Reactor Analyst performed a bounding risk evaluation by using the Surry Standardized Plant Analysis Risk (SPAR) model and failing the “B” ESW pump for a year. The additional risk of the “B” and “C” pumps out simultaneously for a limited exposure time, and the “A” and “B” pumps for a similar limited exposure time were added to the result. The delta-Core Damage Frequency (CDF) due to the performance deficiency was determined to be  $6.3E-8$  (Green). This finding has a cross-cutting aspect in the evaluation component of the problem identification and resolution area (P.2), because the organization did not thoroughly evaluate issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. Specifically, the license did not institute periodic inspections of the 1-SW-3 supports when conditions were present that could challenge the assumptions of their design basis loading.

Enforcement. 10 CFR 50, Appendix B, Criterion XVI states, in part, “Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified.” Contrary to the above, on August 27, 2014, an engineering technical evaluation failed to establish measures to evaluate the effect of SW leakage on the 1-SW-3 value seismic supports to ensure that the evaluation assumptions remained valid until a permanent repair was conducted. A crack on the discharge side of 1-SW-3 was discovered on April 7, 2016 and occurred because the seismic supports for the 1-SW-3 were no longer providing their design function. These supports were evaluated as fully functional in the evaluation performed on August 27, 2014 after a bolt was found missing in one support, but conditions present near the support gradually changed the assumptions making the evaluation invalid. Because the licensee entered the issue into their CAP as CR 1033107 and the finding is of very low safety significance (Green), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000280, 281/2016003-01, Failure to Identify Non-Functioning Service Water Seismic Support Causes Service Water Pipe Crack.

### 1R13 Maintenance Risk Assessments and Emergent Work Control

#### a. Inspection Scope

The inspectors evaluated, as appropriate, the two 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 corrective action program to verify deficiencies in risk assessments were being identified and properly resolved.

- On Sept. 6 and 7, Unit 1 risk while troubleshooting the Unit 1 "A" and "B" reactor trip bypass breakers.
- On Sept 20 and 21, Unit 1 risk while performing troubleshooting on the Unit 1 "B" train channel III of HI-HI consequence limiting system (CLS).

#### b. Findings

No findings were identified.

### 1R15 Operability Evaluations

#### a. Inspection Scope

The inspectors reviewed the six 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 14. The inspectors reviewed the licensee's corrective action program to verify deficiencies in operability determinations were being identified and corrected.

- CR1033326, "B" ESW pump cooling water discharge line degradation
- CR1044689, SW leak from the selector handle bushing for the Unit 2 "B" charging SW pump suction strainer
- CR1045188, "A" technical support center (TSC) air handler unit and TSC electrical room air conditioning units not running
- CR1045721, Unexpected low flow margin following suction bowl cleaning on the "C" ESW pump
- CR1045288, Corroded bolts on the discharge flange of the Unit 1 "A" charging SW pump

- CR1048251, High differential pressure on SW strainer 1-VS-S-1B during flush of the "B" MCR chiller and charging SW header

b. Findings:

No findings were identified.

1R18 Plant Modifications

Permanent Modifications

a. Inspection Scope

The inspectors reviewed the completed permanent plant modification (DC) SU-15-01075, "Reconfiguring Reactor Protection Trip Breaker Ladder Logic Wiring." The inspectors conducted walkdowns of the installation, 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 18. In addition, the inspectors reviewed calculations and conducted interviews with licensee personnel.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed five 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.

- 2-PT-8.1, "Reactor Protection Systems Logic (for Normal Operations) Periodic Test," Revision 36, after replacement of the S1 block auto shunt trip pushbutton.
- 0-OSP-VS-012, "High Flow Flush of SW Strainers and Piping in MER 3 and MER 4," Revision 0, following high negative suction pressure on the MCR chillers.
- 2-PT-18.8A, "Charging Pump Component Cooling Performance Test," Revision 22 (OTO 1), after the Unit 2 "A" charging CC pump mechanical seal replacement.
- 0-ECM-0101-05, "EDG Battery Charge Maintenance," Revision 12 (OTO 1), after replacement of #1 EDG battery charger.

- 0-MPM-0210-01, "Control Room Chiller Performance Checks", Revision 30, after corrective maintenance on the "D" MCR chiller.

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the four 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.

In-Service Testing:

- 1-OPT-FW-003, "Turbine Driven Auxiliary Feedwater Pump 1-FW-P-2 Performance Test, Revision 50 and 1-OPT-FW-007, "Turbine Driven AFW Pump Steam Supply Line Check Valve Test," Revision 7

Surveillance Testing:

- 1-OPT-CS-002, "Containment Spray System Test", Revision 17
- 2-PT-2.33B, "Emergency Bus Undervoltage and Degraded Protection Test "J" Train", Revision, Revision 7
- 0-OPT-EG-001, "Number 3 EDG Monthly Start Exercise Test," Revision 74

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

a. Inspection Scope

The inspectors performed a periodic review of the four following Unit 1 and 2 PIs 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." Specifically, the inspectors reviewed the Unit 1 and Unit 2 data reported to the NRC for the period July 1, 2015 through June 30, 2016.

Documents reviewed included applicable NRC inspection reports, licensee event reports, operator logs, station performance indicators, and related CRs.

- Unit 1 Auxiliary Feedwater MSPI
- Unit 2 Auxiliary Feedwater MSPI
- Unit 1 Emergency AC Power MSPI
- Unit 2 Emergency AC Power MSPI

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 CRs 580345, 5880231-580240, 580495, and 580496 Corrective Actions for the Service Water Internal Flooding Event of May 20, 2015

a. Inspection Scope

The inspectors performed a review of the licensee's assessments and corrective actions associated with Root Cause Evaluation (RCE) 001137 (CR 580345), as well as an ACE 019938 (CR 5880231-580240, 580495, and 580496) related to the internal flooding event of 2015. Specifically, on May 20, 2015, during restoration of flow to the U1 discharge tunnel following maintenance, SW back flowed from the discharge tunnel into the recirculating spray SW discharge piping, and out of an opening created as a result of ongoing maintenance on an expansion joint. This resulted in internal flooding into the safeguards building basement which ultimately overflowed into the Auxiliary Building. The SW also leaked through backflow preventers into the U1 charging pump cubicles.

The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of the licensee's corrective actions to determine whether the licensee was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of the licensee's CAP as specified in procedure, PI-AA-200, "Corrective Action Program," Revision 29 and 10 CFR 50,

Appendix B. In addition, the inspectors reviewed the corrective action program for similar issues.

b. Findings and Observations

No new findings were identified. Finding 05000280, 281/2015003-01, "Charging Pump Cubicle Floor Drain Backflow Preventer Failures during Unit 1 Safeguards Building Flooding" was issued in NRC Integrated Inspection Report 05000280, 281/2015003.

The licensee determined that the root cause of the flooding was a lack of procedural guidance that constrained personnel to function in a knowledge based environment and resulted in the decision to improperly revise the tunnel tagout boundaries. A contributing cause was personnel error with respect to the decision made to revise the tagout. The licensee determined that the apparent cause of the leakage through the backflow preventers into the CH pump cubicles was that the backflow preventers did not meet their implied design basis. The installation document failed to provide an explicit design basis which would have stated their licensing commitment and their design function. The licensee also determined that station personnel were not aware of locations of the backflow preventers. This lack of awareness did not prevent obstructions from interfering with operation of the backflow preventers. A contributing cause was identified which outlined several procedure inadequacies.

Corrective actions taken or planned by the licensee include procedure changes and the complete replacement of the charging cubicle backflow preventers with a different design. The inspectors verified that the licensee had identified problems with this issue at an appropriate threshold and entered them into the CAP; and had proposed or implemented appropriate corrective actions. The inspectors determined that the corrective actions developed as a result of the root and apparent cause analysis were reasonable commensurate with the safety significance of the affected systems.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment and corrective maintenance issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.1. The review included issues documented outside the normal CAP such as health reports, corrective maintenance work orders, component status reports, site monthly meeting reports, and maintenance rule assessments. The inspectors' review nominally considered the six month period of January through June 2016, although some examples expanded beyond those dates when the scope of the trend warranted.

The inspectors compared and contrasted their results with the results contained in the licensee's latest integrated quarterly assessment report. Corrective actions associated with a sample of the issues identified in the licensee's trend report were reviewed for adequacy.

b. Assessment and Observations

No findings of significance were identified. In general, the licensee has identified trends and has addressed the trends with their CAP. No new adverse trends were identified this period that had not already been identified by the licensee.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153 – 1 Sample)

(Closed) Licensee Event Report (LER), 05000-280/2016-001-00, Emergency Service Water Pump Inoperable Due to Corrosion of Valve Support

a. Inspection Scope

On April 7, 2016, at 0638 hours with Surry Power Station Units 1 and 2 operating at 100 percent power, the “B” ESW pump cooling water discharge valve flange was found to be cracked, and the pump was declared inoperable. During flange and valve support activities, four bolts on the cooling water discharge valve support base plate were found to be failed due to corrosion. The flange was replaced and the support base plates were anchored with stainless steel bolts. The “B” ESW pump was returned to operable status on April 9, 2016, at 1105 hours. The cause to the flange support failure was corrosion of the base plate and anchor bolts from repetitive exposure to SW. On May 11, 2016, an engineering evaluation determined that the piping and support had been non-functional for prior operability based on the potential for lateral displacement during a seismic event. Based upon the as-found conditions of the failed valve support anchor bolts, the condition of the “B” ESW pump was determined to be present for a time greater than the seven day TS limiting condition for operation. The inspectors reviewed the Licensee Event Report (LER), the associated ACE and corrective actions, interviewed the license staff, and walked down associated components. This LER is closed.

b. Findings

A self-revealing non-cited violation is reported in section 1R12 of this report.

4OA5 Other Activities

.1 World Association of Nuclear Operators (WANO) Report Review

a. Inspection Scope

The inspectors reviewed the final report for the WANO peer review of Surry Power Station conducted in March 2016. The inspectors evaluated this report to ensure that NRC perspectives of the licensee’s performance were consistent with any issues identified during this assessment. The inspectors also reviewed this report to determine whether WANO identified any significant safety issues that required further NRC follow-up.

b. Findings

No findings were identified.

.2 Independent Spent Fuel Storage Installation (ISFSI) Inspections (IP 60855.1)

a. Inspection Scope

The inspectors reviewed reported changes made to the licensee's procedures and programs for the Independent Spent Fuel Storage Installation (ISFSI) to verify the changes made were consistent with the license and Certificate of Compliance, and did not reduce the effectiveness of the program. The inspectors, through direct observation and independent evaluation, verified cask loading activities were performed in a safe manner and in compliance with approved procedures. Based on direct observation and review of selected records, the inspectors verified the licensee had properly identified each fuel assembly and insert placed in the ISFSI, had recoded the parameters and characteristics of each fuel assembly and insert, and had maintained a record of each as a controlled document. Inspection activities were associated with casks DOM-32PTH-040-C, DOM-32PTH-054-D and DOM-32PTH-056-D. Activities observed include: transport and storage of cask DOM-32PTH-040-C, loading of spent fuel in cask DOM-32PTH-040-C, drying and seal welding activities on DOM-32PTH-040-C, and the heavy lift to remove DOM-32PTH-040-C from fuel building to the ISFSI transport trailer.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On October 12, 2016, the inspection results were presented to Mr. L. Lane 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, Manager, Training  
J. Eggart, Manager, Radiation Protection & Chemistry  
B. Garber, Supervisor, Station Licensing  
M. Haduck, Manager, Outage and Planning  
R. Johnson, Manager, Operations  
L. Lane, Site Vice President  
D. Lawrence, Director, Station Safety and Licensing  
T. Rawls, Manager, Protection Service (Acting)  
J. Rosenberger, Director, Station Engineering  
R. Scanlan, Manager, Maintenance  
R. Simmons, Plant Manager  
M. Smith, Manager, Nuclear Organizational Effectiveness  
N. Turner, Manager, Nuclear Emergency Preparedness

### **LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**

#### **Opened and Closed**

05000280, 281/2016003-01	NCV	Failure to Identify Non-Functioning Service Water Seismic Support Causes Service Water Pipe Crack (Section 1R12)
--------------------------	-----	--

#### **Closed**

05000280/2016-003-00	LER	Emergency Service Water Pump Inoperable Due to Corrosion of Valve Support (Section 4OA3)
----------------------	-----	--

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

#### Other Documents

CALC-ZZZ-02071.1910-M-1, Turbine Building Flood Volume and Operator Response Time, 6/30/92  
Dominion Letter 15-107A, VEPCO (Dominion) Surry Power Station Units 1 and 2 Flood Hazard Reevaluation Report Audit Preparation Documents, 6/11/15  
ETE 14-E15, Dominion Flooding Hazard Reevaluation Report for Surry Power Station Units 1 and 2, Rev. 1  
LA006002, LC001373: 15-107, Flood Hazard Reevaluation Report, 3/09/15  
SU-CALC-CIV-14-221, Local Intense Precipitation Flooding Using Site Specific Precipitation Information – Surry Power Station, Rev. 0

### **Section 1R04: Equipment Alignment**

#### Procedures

1-OP-51.1A, Component Cooling System Alignment, Rev. 25  
1-OP-CH-001A, CVCS System Alignment, Rev. 23  
2-OP-51.1A, Component Cooling System Alignment, Rev. 13  
2-OP-FW-001A, Auxiliary Feedwater System Valve Alignment, Rev. 8

#### Condition Reports (\*NRC Identified)

*1041730	*1042794	*1043377	*1044287	*1044537	*1044856
*1045288	*1045290	*1045491	*1047131	*1047250	*1048230
*1048244	*1048247	*1048287	*1048291		

#### Drawings

11448-FM-072D SH1, Flow/Valve Operating Numbers Diagram Component Cooling Water System Unit 1, Rev. 32  
11448-FM-072D SH4, Flow/Valve Operating Numbers Diagram Component Cooling Water System Unit 1, Rev. 29  
11448-FM-072D SH1, Flow/Valve Operating Numbers Diagram Component Cooling Water System Unit 1, Rev. 32  
11448-FM-072D SH2, Flow/Valve Operating Numbers Diagram Component Cooling Water System Unit 1, Rev. 37  
11448-FM-088B SH2, Flow/Valve Operating Numbers Diagram Chemical & Volume Control System Unit 1, Rev. 52  
11548-FM-068A SH3, Flow/Valve Operating Numbers Diagram Feedwater System Unit 2, Rev. 68

#### Other Documents

CA 295788, Determine/Revise procedures for Relief Valves with Ty Wraps, 6/17/15  
VTM 38-C515-00013, Operating and Safety Instructions Direct Spring Operated Safety Valves, Rev. 3

### **Section 1R05: Fire Protection**

#### Procedures

CM-AA-FPA-100, Fire Protection/Appendix R (Fire Safe Shutdown) Program, Rev. 11  
SA-AA-115, Conduct of Fire Drills, Rev. 2

- 0-LSP-FP-045, Fire Extinguisher Annual Maintenance, Rev. 2
- 0-FS-FP-121, Diesel Generator Room Number 1 Elevation 27 Feet – 6 Inches, Rev. 2
- 0-FS-FP-163, Fuel Building Elevation 6 Feet – 10 Inches and 15 Feet – 10 Inches, Rev. 1
- 0-FS-FP-164, Fuel Building Elevation 27 Feet – 6 Inches and 45 Feet – 10 Inches, Rev. 3
- 0-FS-FP-186, Fuel Oil Pump House A Elevation 16 Feet, Rev. 1
- 0-FS-FP-187, Fuel Oil Pump House B Elevation 16 Feet, Rev. 1
- 1-FS-FP-127, Unit 1 Cable Spreading Room Elevation 45 Feet – 3 Inches, Rev. 5
- 2-FS-FP-101, Unit 2 Cable Vault Penetration Area Elevation 15 Feet – 0 Inches, Rev. 4
- 2-FS-FP-107, Unit 2 Emergency Switchgear Room Elevation 9 Feet – 6 Inches, Rev. 4

Condition Reports

1048957

Drawings

- 11448-FAR-205 SH2, Equipment Location – Appendix ‘R’ Service Building Part. Plan El. 13’-0” Unit 1 & 2, Rev. 18
- 11448-FAR-206 SH8, Equipment Location – Appendix ‘R’ Service Building Part. Plan El. 9’-6” Unit 2, Rev. 22
- 11448-FAR-206 SH6, Equipment Location – Appendix ‘R’ Service Building Part. Plan El. 27’-0” Unit 1, Rev. 8
- 11448-FAR-306 SH14, Fire Barrier Penetrations Service Building Sections – El. 27’-0” Unit 1, Rev. 0

Other Documents

Fire Drill Scenario, 3<sup>rd</sup> Quarter, 2016

**Section 1R06: Flood Protection**

Procedures

- 0-AP-13.00, Turbine Building or MER 3 Flooding, Rev. 29
- 0-OP-ZZ-008, Assessment of Maintenance Activities for Potential Flooding of Turbine Building and Associated Areas, Rev. 13

Other Documents

DC SU-15-01107, MER-3&4 Service Water Improvements

**Section 1R07: Heat Sink Performance**

Procedures

- 0-MCM-0812-01, CC Heat Exchanger Inspection and Cleaning, Rev. 21
- 0-NSP-CC-005, CCHX Tests Using the Temporary Monitoring System, Rev. 5
- 1-OSP-SW-003, Measurement of Macrofouling Blockage of Component Cooling Heat Exchanger 1-CC-E-1B, Rev. 33

Condition Reports

572682	580573	1031900	1038155	1042557
--------	--------	---------	---------	---------

Work Orders

38103721100	38103714604	38PT001448
-------------	-------------	------------

**Section 1R11: Licensed Operator Regualification Program**Procedures

1-OPT-RX-005, Control Rod Assembly Partial Movement, Rev. 32  
 2-OPT-RX-005, Control Rod Assembly Partial Movement, Rev. 34  
 2-OSP-TM-004, Turbine Trip Test, Rev. 12  
 2-PT-8.1, Reactor Protection System Logic, Rev. 36

Other Documents

RQ-16.5-SP-1, Training Scenario, Rev. 0

**Section 1R12: Maintenance Effectiveness**Procedures

1-PT-8.1, Reactor Protection System Logic (For Normal Operations), Rev. 42 {OTO 1}  
 1-PT-8.1, Reactor Protection System Logic (For Normal Operations), Rev. 42 {OTO 2}

Condition Reports (NRC Identified)

507592	521385*	555479	1024316	1027241	1027568
1030984	1031379	1033107	1033270	1033326	1033332
1037785	1037870	1039460	1041249	*1042859	*1044344
1045354					

Work Orders

38103701555                    38103711237

Drawings

11448-1.17-296B, CLS Relay Rack Wiring Diagram Train B, Rev. 2  
 11448-1.17-297B, CLS Relay Rack Wiring Diagram Train B, Rev. 2  
 11448-1.17-299B, CLS Relay Rack Wiring Diagram Train B, Rev. 2  
 11448-FE-4Q, Wiring Diagram Consequence Limiting Safeguard Panel Train B Unit1, Rev. 26

Other Documents

ACE 3021487, Emergency Service Water Pump 1-SW-P-1C Throttle Linkage Ball & Socket Joint Separation, 4/27/16  
 ACE 3033668, ESW Pump Diesel Cooling Water Line and Support Damage, 8/16/16  
 CA 3024020, Corrective Action to Supply Chain Management  
 CA 3024020, Procurement Engineering Services Explanation of Conclusion to CA3024020  
 Calculation 12846.36-NP(S)-Z4067-H3, Evaluation of As-Found Condition Identified in CR555479, Rev. 1  
 Control Wiring Diagram of 1-CC-TV-110C SOV  
 DC SU-15-01083, ESW Pump Foundation Replacement, Rev. 5  
 ETE-SU-2014-0070, Evaluation of Missing Anchors on Hanger 3 on Line 3"-WS-56-136 (1-SW-3), Rev. 3  
 QCE 3011947, Service Water Leak Upstream of 2-SW-336, 11/15/16  
 REA SU-2013-010, Elimination of the ESW Pump Vent Trap (1-SW-TD-82/83/84), 5/03/16

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**Condition Reports

1033152

Other Documents

EOOS Schedulers Risk Evaluation for Surry Power Station, Sept. 6, 2016  
 EOOS Schedulers Risk Evaluation for Surry Power Station, Sept. 7, 2016  
 EOOS Schedulers Risk Evaluation for Surry Power Station, Sept. 21, 2016  
 EOOS Schedulers Risk Evaluation for Surry Power Station, Sept. 22, 2016

**Section 1R15: Operability Determinations and Functionality Assessments**Procedures

0-MCM-0607-02, Eaton (Hayward) 53BTX Duplex Basket Strainer Maintenance, Rev. 1  
 0-OPT-SW-003, Emergency Service Water Pump 1-SW-P-1C, Rev. 57  
 0-OSP-VS-012, High Flow Flush of SW Strainers and Piping in MER 3 and MER 4, Rev. 1  
 {OTO 1}  
 0-OSP-VS-012, High Flow Flush of SW Strainers and Piping in MER 3 and MER 4, Rev. 1  
 {OTO 2}  
 Surry Power Station Emergency Plan, Rev. 62

Drawings

11448-FB-006D SH4, Flow/Valve Operating Numbers Diagram Auxiliary Ventilation System Unit  
 1 & 2, Rev. 11  
 11448-FB-24A, Vent. Arrangement/Service Building Floor Elevations 27' – 0' & 9' – 6" Columns  
 4 Through 19 Unit 1 & 2, Rev. 22  
 S-03066-0-C-001 SH1, Duplex Strainer Selector Handle Extension Details, Rev. 0  
 S-03066-0-C-001 SH2, Duplex Strainer Selector Handle Extension Details, Rev. 0

Condition Reports

572638	1041840	1042607	1044689	1045188	1045189
1045288	1045721	1048206	1048251	1048271	1048589

Work Orders

38103747846

Other Documents

38-H834-00005, Installation, Operation & Maintenance Manual Hayward Model 53BTX Duplex  
 Strainer, Sizes ¾" – 4", Rev. 3  
 DNES-SU-ME-00004, Pipe Class Design Standard, Rev. 1  
 ETE-SU-2014-0070, Evaluation of Missing Anchors on Hanger 3 on Line 3"-WS-56-136  
 (1-SW-3), Rev. 3  
 ETE-SU-2016-1010, Evaluation of Bondstrand QA Status Changes, Rev. 0  
 PTE 10000035952, Bondstrand Dedication Site Dedication per Applicable ETEs, Rev. 3  
 SUI-0006, Specification for Installation of Piping and Mechanical Equipment, Rev. 8

**Section 1R18: Plant Modifications**Procedures

1-PT-8.2, Reactor Protection Logic Periodic Test, Rev. 24  
 2-PT-8.2, Reactor Protection Logic Periodic Test, Rev. 26

Drawings

1501075-113E244-A, Reactor Protection System Surry Power Station - Unit 1, Rev. 0  
 1501075-113E244-B, Reactor Protection System Surry Power Station - Unit 1, Rev. 0  
 1501075-113E244A-A, Reactor Protection System Surry Power Station - Unit 2, Rev. 0

1501075-113E244A-B, Reactor Protection System Surry Power Station - Unit 2, Rev. 0  
 150175-E-801-A, Reactor Protection System Reactor Trip Breaker Ladder Logic Surry Power Station – Unit 1, Rev.0  
 150175-E-801-B, Reactor Protection System Reactor Trip Breaker Ladder Logic Surry Power Station – Unit 1, Rev.0  
 150175-E-802-A, Reactor Protection System Reactor Trip Breaker Ladder Logic Surry Power Station – Unit 1, Rev.0  
 150175-E-802-B, Reactor Protection System Reactor Trip Breaker Ladder Logic Surry Power Station – Unit 1, Rev.0

Other Documents

DC SU-15-01075, Reconfiguring Reactor Protection Trip Breaker Ladder Logic Wiring, Rev. 0

**Section 1R19: Post Maintenance Testing**

Procedures

0-ECM-0101-05, EDG Battery Charger Maintenance, Rev. 12 {OTO 1}  
 0-MPM-0210-01, Control Room Chillers Performance Checks, Rev. 30  
 0-OSP-VS-012, High Flow Flush of SW Strainers and Piping in MER 3 and MER 4, Rev. 0  
 2-PT-8.1, Reactor Protection System Logic (For Normal Operations), Rev. 36  
 2-PT-18.8A, Charging Pump Component Cooling Performance, Rev. 22 {OTO 1}

Condition Reports (\*NRC Identified)

\*1042905      1042920

Work Orders

38076858201              38103554448              38103637771              38103700287  
 38103741078

**Section 1R22: Surveillance Testing**

Procedures

0-MCM-0113-02, Auxiliary Feedwater Pump Inspection and Maintenance, Rev. 19  
 0-OPT-EG-001, Number 3 EDG Monthly Start Exercise Test, Rev. 74  
 1-OPT-CS-002, Containment Spray System Test, Rev. 17  
 1-OPT-FW-003, Turbine Driven Auxiliary Feedwater Pump 1-FW-P-2, Rev. 50  
 1-OPT-FW-007, Turbine Driven AFW Pump Steam Supply Line Check Valve Test, Rev. 7  
 2-PT-2.33B, Emergency Bus Undervoltage and Degraded Protection Test “J” Train, Rev. 7

Work Orders

38103701424              38103701436              38103702132              38103709742  
 38103715795              38103722847

**Section 40A1: Performance Indicator Verification**

Other Documents

ER-AA-SPI-101, Implementation of the Consolidated Data Entry (CDE) Reporting for Mitigating System Performance Index (MSPI), Rev. 0  
 NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 7  
 SU-2014-0082, MSPI Basis Document, Rev. 0

**Section 4OA2: Identification and Resolution of Problems**Procedures

0-OP-ZZ-008, Assessment of Maintenance Activities for Potential Flooding of Turbine Building and Associated Areas, Rev. 13

0-MPM-1900-02, Flood Protection Floor Drain Back Water Stop Valve Replacement, Rev. 15

0-VSP-M4, Flood Control Panel Trouble Annunciator Response Procedure, Rev. 5

OP-AA-200, Equipment Clearance, Rev. 23

PI-AA-200, Corrective Action, Rev. 29

Condition Reports

580345	580231	580232	580233	580234	580235
580236	580237	580238	580239	580240	580495
580496	1044748				

Other Documents

RCE 001137, Service Water Intrusion into U1 Safeguards and Auxiliary Building, 7/08/15

ACE 019938, Functionality of Charging Pump Cubicles Back Flow Preventers, 7/22/15

DCU SU-15-01064, Replacement of Station Backflow Preventers, Rev. 3

SPS UFSAR Appendix 9C Flood Control System, Rev. 47

Surry Power Station Integrated Trend Report First Quarter 2016

Surry Power Station Integrated Trend Report Second Quarter 2016

Surry Power Station Performance Improvement Action Plan, July 2016

**Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion**Other Documents

LER 05000280/2016-003-00, Emergency Service Water Pump Inoperable Due to Corrosion of Valve Support

**Section 4OA5: Other Activities**Procedures

0-HSP-ISFSI-002, NUHOMS Dry Spent Fuel Storage System Surveillance, Rev. 5

0-OP-FH-073, TC/DSC Transfer to ISFSI and DSC Transfer from TC to HSM, Rev. 12

HP-1061.500, NUHOMS Spent Fuel Cask Preparation/Loading and Transport to ISFSI, Rev. 5

MA-AA-101, Fleet Lifting and Material Handling, Rev. 17

VPAP-0809, NUREG-0612 Heavy Load Program, Rev. 10