



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200  
ATLANTA, GEORGIA 30303-1200

December 30, 2020

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

**SUBJECT: SURRY POWER STATION – 95001 SUPPLEMENTAL INSPECTION  
SUPPLEMENTAL REPORT 05000281/2020040**

Dear Mr. Stoddard:

On November 20, 2020, the U.S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection using Inspection Procedure 95001, "Supplemental Inspection Response to Action Matrix Column 2 Inputs," and discussed the results of this inspection and the implementation of your corrective actions with Mr. Lawrence and other members of your staff at an exit and regulatory performance meeting on November 20, 2020.

The NRC performed this inspection to review your station's actions in response to a White finding in the Mitigating Systems cornerstone which was documented and finalized in NRC Inspection Report 2020091. On October 8, 2020, you informed the NRC that your station was ready for the supplemental inspection.

The NRC determined that your staff's evaluation identified the cause of the finding. Specifically, The NRC determined your staff's evaluation identified the primary root cause as non-conservative interpretation of site procedures and industry guidance used during development of the check valve condition monitoring program. The root cause had three contributing causes related to a lack of interface between programs, a lack of process to drive review of monitoring plans following corrective maintenance, and inconsistent documentation of maintenance patterns and failure mechanisms. In addition, your staff performed an evaluation for the inoperability of the auxiliary feedwater system in which it identified the root cause to be inadequate preventive maintenance due to cancelation of work activities to open and inspect the Unit 2 turbine-driven auxiliary feedwater (TDAFW) pump discharge check valve 2-FW-142. The extent of conditions was determined to potentially affect all check valves in the in-service test program and check valves in similar applications.

The corrective actions to prevent recurrence include replacement of pump and valve components in the Unit 2 TDAFW system, intrusive inspections (disassembly of affected check valves to look for wear or degradation), updates to fleet procedures, creation of recurrent maintenance tasks for the affected valves, interim acoustic testing, and updates to check valve monitoring plans that will also validate requirements of American Society of Mechanical Engineers (ASME) Operation and Maintenance (OM) Code, Mandatory Appendix II, "Check Valve Condition Monitoring Program," are met.

The NRC determined that completed or planned corrective actions were sufficient to address the performance issue that led to the White finding. Therefore, the performance issue will not be considered as an Action Matrix input after the end of the first quarter of 2021. Based on the results of this inspection and our Action Matrix assessment, the NRC has determined that Surry Power Station Unit 2 will transition to the Licensee Response Column (Column 1) of the Action Matrix on April 1, 2021, considering no additional Action Matrix inputs occur.

No findings or violations of more than minor significance were identified during this inspection.

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 Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Stewart N. Bailey, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Docket No. 05000281  
License No. DPR-37

Enclosure:  
As stated

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SUBJECT: SURRY POWER STATION – 95001 SUPPLEMENTAL INSPECTION  
SUPPLEMENTAL REPORT 05000281/2020040 Dated December 30, 2020

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DATE	12/29/2020	12/29/2020	12/30/2020		

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**U.S. NUCLEAR REGULATORY COMMISSION  
Inspection Report**

Docket Number: 05000281

License Number: DPR-37

Report Number: 05000281/2020040

Enterprise Identifier: I-2020-040-0004

Licensee: Virginia Electric and Power Company (Dominion Energy)

Facility: Surry Power Station

Location: Surry, VA

Inspection Dates: November 16, 2020 to November 20, 2020

Inspectors: K. Carrington, Resident Inspector  
T. Scarbrough, Senior Mechanical Engineer  
M. Schwieg, Reactor Inspector

Approved By: Stewart N. Bailey, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Enclosure

## **SUMMARY**

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a 95001 supplemental inspection at Surry Power Station, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

### **List of Findings and Violations**

No findings or violations of more than minor significance were identified.

### **Additional Tracking Items**

None.

## INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, conducted walkdowns, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

## OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

### 95001 - Supplemental Inspection Response to Action Matrix Column 2 Inputs

The inspectors reviewed and selectively challenged aspects of the licensee's root cause analysis, including extent of condition, extent of cause reviews, and corrective actions in response to a White finding and associated Notice of Violation (NOV) of 10 CFR 50.55a(f)(4) for its failure to meet the inservice test (IST) requirements set forth in Mandatory Appendix II, "Check Valve Condition Monitoring Program," of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance (OM) of Nuclear Power Plants. Specifically, the station did not analyze known failure or maintenance patterns of the Unit 2 TDAFW check valve 2-FW-142 to determine their significance and identify potential failure mechanisms. The finding and associated NOV is discussed in NRC Inspection Report and Final Significance Determination Letter 05000281/2020091. The inspectors utilized information in root cause evaluation (RCE) reports CA8117061 and CA7783062 to assess whether objectives of the inspection procedure (IP) were met. Highlights of the performance review and NRC's assessment are documented below.

### Supplemental Inspection Response to Action Matrix Column 2 Inputs (1 Sample)

- (1) From November 16, to November 20, 2020, the inspectors conducted an onsite review to verify all aspects of the inspection procedure were met.

## INSPECTION RESULTS

Assessment	95001
1. <u>Problem Identification</u>	
a. <u>Identification</u> On November 20, 2019, during performance of the Unit 1 Auxiliary Feedwater (AFW) Pump Check Valve Operability test (1-OPT-FW-142), an operator discovered the Unit 2 Turbine-driven auxiliary feedwater (TDAFW) pump rotating in the reverse direction due to excessive back leakage through the Unit 2 TDAFW pump discharge check valve (2-FW-142). Consequently, the Unit 2 AFW system was declared inoperable and deemed incapable of performing its safety function. Within 20 minutes of the event, operators closed the Unit 2 TDAFW manual discharge isolation valves, restoring the safety function to the AFW system. From November 20 to 22, 2019, Unit 2 remained in a 72-hour technical specification (TS) limiting condition of operation (LCO) action statement for	

inoperability of the TDAFW system. The TS action statement was exited following repairs to the TDAFW pump and turbine bearings and check valve 2-FW-142. The failure of the TDAFW check valve revealed weaknesses in the station's preventive maintenance (PM) and check valve condition monitoring (CVCM) programs since its establishment which ultimately led to an NRC-identified finding for the failure to meet the inservice test (IST) requirements of the ASME OM Code. The licensee documented that the lack of a rigorous review and challenge of legacy decisions made prior to and during inception of its CVCM program contributed to its failure to identify the performance issue.

b. Exposure Time and Identification Opportunities

The root cause evaluations (RCEs) documented a potential for failure of the Unit 2 TDAFW check valve 2-FW-142 had existed since the preventive maintenance (PM) requirement to periodically disassemble and inspect the valve's internals for wear and degradation was first cancelled in 1996. From 1996 to 2004 (when the station adopted its CVCM program) and thereafter, Surry relied on periodic leakage testing to monitor the internal condition of the valve. The licensee's procedure at the time considered disassembly and inspection appropriate for valves that couldn't be tested under design bases conditions. In the RCE, the licensee stated that check valve disassembly inspections would be performed if other testing options were unavailable. In RCE CA8117061, the licensee identified conflicting industry guidance documents were referenced in the procedure. For example, EPRI document NP-5478, "Application Guide for Check Valves in Nuclear Plants," warned that leakage tests may not give indication of impending failures while a Nuclear industry check valve users group (NIC) document indicated leakage tests were good predictors of future failures from hinge pin wear and valve degradation (the exact failure mechanism of the 2-FW-142 valve). The licensee noted this discrepancy was never addressed in the original procedure and due to the lapse in time could not determine the basis for the PM cancellation or continued acceptance of the leak testing to detect internal valve wear during adoption of its program. The inspectors concluded the RCEs appropriately assessed exposure and identification opportunities.

c. Risk and Compliance

Both RCEs documented that the Unit 2 AFW system was declared inoperable and incapable of performing its safety function until the Unit 2 TDAFW manual discharge isolation valves were closed. The RCEs also documented the qualitative consequences of the event and performance issue with respect to nuclear, radiological, safety culture, and industrial consequences. Based on their review, the inspectors concluded the RCEs demonstrated an understanding of significant plant consequences and compliance concerns associated with the event and performance issue.

NRC Assessment: The inspectors' review determined the licensee's evaluation documented who identified the issues, how long the issues existed, prior opportunities for identification, and the plant-specific consequences of the event. The inspectors had the following observations:

- Neither RCE captured quantitative risk insights related to the performance issue or event.
- The licensee's review of CVCM plans did not consider quantitative risk measures of check valves like the failed TDAFW check valve (2-FW-142) which had a high plant risk profile (Birnbaum value greater than  $1E-6$ ) and resulted in the NRC-issued white finding. The inspectors also identified other high-risk ( $>1E-6$ ) check valves that were given a low level of concern during the licensee's review.

- While reviewing the past operability evaluations, the inspectors identified another scenario not considered by the licensee involving auto-initiation of all AFW pumps which could render the AFW system inoperable.
- The RCEs placed less emphasis on the fact the TDAFW check valve was identified as being susceptible to excessive leakage and degradation due to its location which caused it to see turbulent flow conditions - the initial basis for the PM that was canceled.
- The inspectors considered that the maintenance and performance history of check valves at Surry provided additional opportunities for the identification of weaknesses in the implementation of the CVCM Program prior to the failure of the TDAFW check valve 2-FW-142. The inspectors reviewed several condition reports related to check valve performance dating back to 2006 that confirmed prior opportunities existed for the identification of weaknesses in the CVCM Program. These were not referenced in the licensee's RCEs.

## 2. Root Cause, Extent of Condition, and Extent of Cause Evaluation.

### a. Methodology

The licensee employed systematic, evidenced-based methodologies including, Why Staircase analysis, Event and Causal Factors Analysis, Fishbone Analysis, Programmatic and Organizational Chart Analysis, and the Decision-Making Evaluation tool to gather data, identify the problem, and determine the root cause and contributing causes of the White finding and AFW system inoperability.

- RCE CA8117061 identified the root cause as non-conservative interpretation of site procedures and industry guidance documents used during development of the CVCM Program that resulted in a bias by licensee personnel that leak testing was a reliable predictor of future check valve failures associated with hinge pin wear and other valve degradation of the closed obturator position changing relative to the valve seat. This RCE listed three contributing causes: (1) no process link between the CVCM program and preventive maintenance program; (2) no process driven mechanism to initiate a review of the check valve condition monitoring plan in accordance with ASME OM Code, Appendix II, when corrective maintenance was performed; and (3) CVCM plans inconsistently document the basis for the decisions made related to maintenance patterns and failure mechanisms during initial development.
- RCE CA7783062 identified the root cause of the inoperability of the AFW System as inadequate preventative maintenance of the TDAFW check valve 2-FW-142 as a result of decisions in 1996 and 2005 to cancel work orders to disassembly and inspection of the check valve and to place the preventive maintenance in an "On Demand" status. During the inspection, the licensee stated that the performance of an open/inspect activity for a valve in the "On Demand" status meant that its inspection depended on the identification of a performance issue with the valve. This RCE did not list any contributing causes for the valve failure.

### b. Level of Detail

The inspectors determined the RCEs, in aggregate, were performed to a level of detail commensurate with the safety significance and complexity of the performance issue and was of sufficient detail to identify the root and contributing causes, extent of conditions, and extent of causes. The RCE teams utilized a formal cause analysis process to identify the problems and determine corrective actions. The RCEs were performed by individuals in the licensee's organization with varying levels of experience and backgrounds. The



licensee also utilized an independent contractor during development of RCE CA8117061 to perform a review and assessment of its CVCM program and aid in its identification of extent of condition, extent of cause, and corrective actions.

c. Operating Experience

The inspectors noted RCE8117061 accounted for prior occurrences of the performance issue and check valve failure throughout the industry and at the site. RCE CA8117061 identified applicable industry operating experience in NRC Information Notice 2000-21, "Detached Check Valve Disk Not Detected by Use of Acoustic and Magnetic Non-intrusive Test Techniques," which describes the exact valve failure at another site related to non-intrusive tests failing to identify significant check valve degradation. The inspectors concluded the licensee appropriately considered prior occurrences and operating experience.

d. Extent of Condition and Cause

Based on their separate root cause determinations, RCEs CA7783062 and CA8117061 included different evaluations of the extent of condition and extent of cause for the TDAFW check valve 2-FW-142 failure. In RCE CA7783062, the licensee's extent of condition evaluation for the TDAFW check valve failure focused on safety-related swing check valves without an open/inspect PM that are subject to excessive wear. This extent of condition also included the opposite unit's TDAFW pump discharge check valve, both units' motor driven AFW pump discharge check valves, and both units' high head safety injection charging pumps' discharge check valves due to a similar configuration to the AFW system. RCE CA8117061 provided a broader evaluation of the cause of the failure of the check valve from a programmatic perspective. RCE CA8117061 specified that the extent of condition evaluation for the programmatic issue was bounded to all check valves in the IST Program. RCE CA8117061 also specified the extent of cause was bounded to other components in the IST Program, including pumps, valves, check valves, pressure reducing devices, and dynamic restraints (snubbers). RCE CA8117061 also indicated that all IST procedures were reviewed against the ASME OM Code requirements, with a representative sample (approximately 10 percent) of the components from each program reviewed to ensure that monitoring of the components was being performed in accordance with site and fleet procedures. The RCE documented that a 100 percent review of all IST check valves at the site was conducted, and a 100 percent review of the snubber maintenance and inspection history will be conducted as a follow-on action. The inspectors concluded the licensee appropriately identified the extent of condition and extent of cause.

e. Safety Culture

The inspectors reviewed the safety culture components referenced in NUREG-2165, "Safety Culture Common Language," to determine if these were appropriately considered during the licensee's evaluations of the root causes, extent of conditions, and extent of causes.

NRC Assessment: The inspectors' review determined the licensee's evaluations were documented at a sufficient level of detail, included relevant operating experience, and identified the root causes, contributing causes, extent of conditions, and extent of causes of the performance issue and event. The inspectors determined the licensee's RCEs considered the safety culture aspects related to decision making and questioning attitude. The inspectors had the following observations:

- One or more evaluation tools were lacking in detail and did not have clear logic ties to the root and contributing causes. By the end of the inspection, the licensee provided documentation explaining its thought process and links to the contributing and root causes. The licensee chose to perform a separate root cause to focus on the programmatic failures of compliance with the ASME code however, the inspectors noted it was difficult to determine that no bias existed due to the new root cause's team knowledge of CA7783062 results and overlapping details between the two RCEs.
- With respect to operating experience, the inspectors noted the licensee's RCE placed less weight related to check valve performance issues at the site, including prior occurrences of excessive valve leakage, degradation, and failures.

### 3. Corrective Actions

#### a. Corrective Actions Taken

As discussed in the licensee's written response to the NOV and finding, the licensee performed a formal evaluation to determine the root cause of the AFW event that resulted in the station's failure to meet its technical specifications. The evaluation identified inadequate preventive maintenance as the root cause, specified in CA7783062. The inspectors noted all but one corrective action to prevent recurrence of the licensee's failure to meet the IST requirements of the ASME code (addressed in CA8117061) were incomplete at the time of the inspection.

The completed corrective actions to address the root cause and technical specification noncompliance for the inoperability of the AFW system included: restoring the AFW system by isolating valves in the TDAFW system, implementing repairs to the Unit 2 TDAFW pump and discharge check valve, verifying a similar failure mechanism identified for the Unit 2 TDAFW check valve was not present in the Unit 1 TDAFW check valve (1-FW-142), and disassembling and inspecting safety-related check valves in similar applications or systems on both units. Additionally, the licensee established recurrent PM activities to inspect the components in the identified valves, and established acoustic monitoring to ensure valve closure following testing.

NRC Assessment: Based on their review, the inspectors determined the corrective actions to prevent recurrence of the AFW inoperability were prioritized with their safety significance and appeared adequate.

- The inspectors determined CA7783062 established qualitative effectiveness measures of success for each corrective action to prevent recurrence.
- The effectiveness measures will involve successful establishment of a PM for each of the recommended valves and maintenance feedback on interim acoustic testing.

#### b. Corrective Actions Planned

The planned corrective actions to prevent recurrence of the root and contributing causes identified in RCE 8117061 that are related to the licensee's failure to meet the IST requirements of the ASME OM code will include:

CAPR-1) updates to the licensee's check valve condition monitoring fleet procedure to provide guidance on when to open and inspect valves;  
 CAPR-2) requirement for fleet challenge review when changes to the check valve condition monitoring plan are warranted;

CAPR-3) training on when opening and inspection of check valves are required; CAPR-4) incorporation of lessons-learned based on training gap analysis process; CACC-01) updates to inservice test procedure to include guidance to inservice test engineer to review changes through recurrent tasks for inservice test components; CACC-02) updates to include a step for inservice test engineer to initiate a condition report if corrective maintenance was performed or is required, and a significant change is warranted so that a review of the basis in the CVCM plan for the check valve and the associated group or similar groups IAW ASME OM Code Appendix II Section 5000 is performed; and STCA-02) update CVCM plan to include open and inspect where required based on the extent of condition review and validate the updated CVCM program includes all the programmatic requirements from each section in Appendix II of the ASME OM code. (Revised during inspection).

Additionally, planned corrective actions will include improvements to the licensee's CVCM Program and IST Program for other components (such as pumps, snubbers, and other valve types). Revisions to CVCM plans will be prioritized via a tiered approach that is based on risk or ranking of the check valve. Since the majority of corrective actions are not scheduled for completion until December 2021, the inspectors could not evaluate their effectiveness during this inspection. The licensee's final effectiveness review will measure success through performance of a self-assessment of its CVCM program. The two-year self-assessment will ensure compliance when establishing or modifying CVCM criteria, the common failures or maintenance patterns are analyzed so that all in-service testing requirements set forth in ASME OM code of record is met and will allow for accumulation of CVCM plan modifications. The inspectors noted the completion date of the effectiveness review was reasonable.

NRC Assessment: The inspectors concluded the dates for implementation and completion of the planned root and contributing cause corrective actions were reasonable, effective, and prioritized with consideration for risk significance and regulatory compliance. The inspectors also concluded the licensee established qualitative measures of success to evaluate the effectiveness of their corrective actions. The inspectors had the following observations:

- The contributing causes appeared to be more reflective of the root cause of the performance issue. However, the licensee maintained that the bias pertaining to leak testing created from the guidance in the procedure resulted in the station's failure to satisfy the monitoring criteria in its program to even consider analyzing common failure or maintenance patterns and determining their significance. The licensee's initial planned corrective actions were not clear regarding resolution of the programmatic weaknesses in the CVCM Program at Surry Units 1 and 2. To clarify its ongoing activities, the licensee developed enhancements to its planned corrective actions by revising several actions and establishing a new condition report to provide assurance that the programmatic aspects related to the failure of TDAFW check valve 2-FW-142 will be addressed through redevelopment of its CVCM Program to satisfy the requirements in the ASME OM Code, Appendix II. These enhancements included: (1) ensure periodic Engineering training is conducted on the CVCM Program implementation requirements in accordance with the ASME OM Code, Appendix II, CVCM Program (including how to disposition check valve open/inspect inspections as required by station procedures); (2) perform a station self-assessment utilizing external peer review of the implementation of the CVCM Program using the ASME OM Code, Appendix II, CVCM Program criteria after completion of planned corrective

actions; (3) validate that the updated CVCM Program includes all the programmatic requirements from each section of Appendix II; and (4) benchmark CVCM Programs at specific nuclear power plants and evaluate for CVCM Program enhancements at Surry. With the enhancements to the planned corrective actions, the inspectors determined that the licensee had established prompt actions to effectively preclude repetition of the significant performance issues related to the failure of TDAFW check valve 2-FW-142 in meeting the ASME OM code requirements.

- The inspectors noted obsolete information in the licensee's procedures pertaining to non-intrusive testing methods.

4. Old Design Issue Evaluation

The inspectors did not evaluate the finding and associated violation for treatment as an Old Design Issue as it did not satisfy the criteria specified in IMC 0305 Section 11.05.

5. Conclusion

The inspectors concluded the corrective actions to preclude repetition of the root and contributing causes of the performance issue and event were effective and adequately prioritized considering safety significance and regulatory compliance. In addition, the inspectors determined the licensee established qualitative measures of success for determining the effectiveness of the corrective actions. Based on the results of the inspections, the inspectors concluded the objectives of the IP were met.

## **EXIT MEETINGS AND DEBRIEFS**

The inspectors verified no proprietary information was retained or documented in this report.

- On November 20, 2020, the inspectors presented the 95001 supplemental inspection results to Mr. Doug Lawrence and other members of the licensee staff.

**DOCUMENTS REVIEWED**

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
95001	Corrective Action Documents	CA7783062	Unit 2 Auxiliary Feedwater System Declared Inoperable	0
		0-MCM-0417-40	Schutte & Koerting Check Valve Inspection and Overhaul	15
		0-MCM-0417-45	Vogt Piston Check Valve Inspection and Overhaul	14
		CA3003883	Degraded Service Water Conditions Resulted in 0-AP-12 Entry	
		CA7602259	Effectiveness Review	December 2017
		CA8085172	Establish open and inspect PMs for leak tested only CVCM valves	07/16/2020
		CA8166324	CAPR-4 Incorporate lessons learned from RCE in Eng Continuing Training for Tech Conscience	10/12/2020
		CA8166328	CACC-03 Update all CVCM plans (Tier 2 att 11)	10/12/2020
		CA8166345	Perform Effectiveness Review RCE8117061	10/12/2020
		CA8225156	Perform Effectiveness Review of RCE CA7783062 CAPRs	11/10/2020
		CR005239	Open and Inspect for IST check valves not performed	12/05/2006
		CR005241	Open and Inspect on IST check valves not performed	12/05/2006
		CR009004	2-CC-P-2B rotating backwards	03/21/2007
		CR009378	Informal IST Self Assessment Item – Check Valve Condition Monitoring	03/26/2007
		CR013522	2007 INPO Plant Evaluation	06/11/2007
		CR103245	Critical observation of the inspection of 1-SW-262	07/08/2008.
		CR1136400	2-FW-P-2 Rotating in Reverse Drection	11/20/2019
		CR1150753	NRC Preliminary White Finding and Apparent Violation	06/30/2020
		CR1151793	Boric Acid buildup on 1-CH-133	07/18/2020
		CR1152636	Notice of Violation (White) received for 11/19/2019 TDAFW pump check valve failure event	07/31/2020
		CR1155323	0-DRP-012 references	09/14/2020
		CR1155531	Check valve condition monitoring plan for U1 group 73 check valves not current revision in Doctop	09/16/2020
		CR1155534	CVCM plans for Group 76 reference a PM strategy that is	09/16/2020

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			TBD	
		CR8166329	STCA-02 Update CVCM Plans (Tier 1 att 1)	10/12/2020
		CR8166345	Perform Effectiveness Review RCE8117061	10/12/2020
		RCE CA7783062	Unit 2 Auxiliary Feedwater System Declared Inoperable	0
		RCE CA8117061	White Finding for 2-FW-142 not Meeting Inservice Testing Requirements of ASME Code	0
	Corrective Action Documents Resulting from Inspection	CR 161168	95001 Inspection Identified Cause Evaluation Tools used in RCE 8117061 are not Linked to a Cause	11/19/2020
		CR1160995	Grease Leakage out of 1-CH-MOV-1287B operator	11/17/2020
		CR1160997	Packing Leakage at 1-FW-170	11/17/2020
		CR1161141	Surry 95001 Supplemental Inspection for the White Finding associated with 2-FW-142 CVCM Program	11/19/2020
		CR1161141	Surry 95001 Supplemental Inspection for the White Finding associated with 2-FW-142 CVCM Program	11/19/2020
	Drawings	CR1161168	95001 Inspection identified Cause evaluation tools used in RCE 8117061 to a cause	11/19/2020.
		11448-FM-068A, Sheet 1	Surry Power Station Unit 1 Flow/Valve Operating Numbers Diagram Feedwater System, Drawing	65
		11448-FM-068A, sheet 1	Surry Power Station Unit 1 Flow/Valve Operating Numbers Diagram Feedwater System	30
		11448-FM-068A, Sheet 3	Surry Power Station Unit 1 Flow/Valve Operating Numbers Diagram Feedwater System Drawing	67
	Miscellaneous	11548-WMKS-0118G1-1	Inservice Inspection Isometric WAPD Sys: Aux. Feed-Outside Cont. Surry Power Station Unit 2 Virginia Power Drawing	5
			Dominion Qualification Record (DQR) DQR-PGM-IST-AA-Fleet Lead/Site Owner	3
			2-FW-142 (AFW Pump 2 Discharge Check Valve) Prior Operability Review	
			ASME OM Code	2004 Edition to 2006 Addenda
			System Health Reports, AFW Auxiliary Feedwater (2015 to 2020)	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Check Valve Condition Monitoring Plan Group 1-017a	
			1-OPT-FW-008 Check Valve Back Leakage Recent History	
			2-OPT-FW-008 Check Valve Back Leakage Recent History	
			Phoenix ACT Calculation for 1-OPT-FW-008	11/26/2019
			Check Valve Condition Monitoring Plan Group 1-034	
			Check Valve Condition Monitoring Plan Group 1-047	
			Surry Power Station Response to Request for Regulatory Conference	07/02/2020
			Surry Nuclear Plant Units 1 & 2, Plan: IST Program Basis Interval 5	1
			Surry Check Valve Condition Monitoring Program Condition Monitoring Plans, Unit 2 Check Valve Groups	09/10/2020.
			Surry Check Valve Condition Monitoring Program Condition Monitor Plans, Unit 1 Check Valve Groups	09/10/2020
			Surry Power Station Unit 1 Inservice Testing Program Plan for Pumps and Valves, Fourth Inspection Interval, May 10, 2004 – May 9, 2014	8
			Surry Power Station Unit 1(2) Inservice Testing Program Plan for Pumps and Valves, Fifth Testing Interval, May 10, 2014 – May 09, 2024	1
			Check Valve Condition Monitoring Plan Group 1-008	
			Root Cause Evaluation Quality Index RCE CA8117061	10/02/2020
			Surry Power Station Unit 2 Reply to Notice of Violation; EA-20-057	08/28/2020
		LER 05000281-2019-002-00	Auxiliary Feedwater Loss of Safety Function due to Check Valve Failure to Close	01/17/2020
		Vendor Technical Manual 38-W780-00003	Maintenance Manual Cast Steel, Bolted Bonnet, Gate, Globe and Swing Check Valves	4

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		Vendor Technical Manual 38-W780-00002	The Walworth Company Maintenance Manual Cast Steel Bolted Bonnet Gate, Globe and Swing Check Valves	1
		Virginia Power PM Task Evaluation Request MM95013	Develop PM to 'Open/Inspect' the subject check valves on a R03 frequency	02/07/1995
	Procedures	0-MCM-0417-55	Enertech Type DRV-Z Nozzle Check Valve Maintenance	7
		0-MCM-0417-60	Pacific Swing Check Valve Inspection and Overhaul	9
		0-MCM-0417-70	Newco Check Valve Inspection and Overhaul	6
		0-MCM-0417-75	Stockham Swing Check Valve Inspection and Overhaul	7
		0-MCM-0417-01	Velan Swing Check Valves Inspection and Overhaul	27
		0-MCM-0417-49	William Powell Swing Check Valve Inspection and Overhaul Model 559 & 2433	6
		0-MCM-0417-50	William Powell Swing Check Valve Inspection and Overhaul Model 559 & 2433	8
		0-MCM-0417-52	William Powell Swing Check Valve Inspection and Overhaul Model 2342	11
		0-MCM-0417-55	Enertech Type DRV-Z Nozzle Check Valve Maintenance	7
		0-MCM-0417-60	Pacific Swing Check Valve Inspection and Overhaul	9
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		0-MCM-0417-80	Walworth Swing Check Valve Inspection and Overhaul	7
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		PIR 1039265	2016 IST Pump and Valve Self-Assessment	12/15/2016
	Work Orders	38204228028	PM: Valve Replacement, 01-CH--109-CKVALV	
		00456679-10	AFW Pump 2 Disch Chk Valve	03/30/2002

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		3800332715-01	AFW Pump 2 Disch Chk Valve	05/05/1996
		38103688622	547 Day Freq. PT: AFW Check Valve Operability – OC-23B	06/07/2017
		38204178571	91 Day Freq.: IST Guidance for Check Valve Selecting & Tracking	12/13/2018
		38204204469	84 Day Freq. PT: Motor Driven Aux. FW Pump 1-FW-P-OC-22A	05/09/2020
		38204209889	Open/Inspect/Repair Check Valve	11/21/2019
		38204209891	Bearing Inspections/Repairs	11/21/2019
		38204209939	Open/Inspect Check Valve (EOC)	11/21/2019.
		38204209948	Tack Weld Pin	11/21/2019.
		38204210572	84 Day Freq. PT: Mtr Driven Aux FW Pump 1-FW-P-3B-OC-22A	06/11/2020.
		38204212217	Open/Inspect/Overhaul (RCE CA7783062) (R/R)	4/24/2020
		38204213442	Open/Inspect Check Valve (RCE CA7783062) (R/R)	03/12/2020
		38204216386	PM: Open/Inspect Check Valve	04/20/2020.
		38204218301	84 Day Frequency. PT: Mtr Driven Aux FW Pump 1-FW-P-3B- OC-22A	10/28/2020.
		38204225060	PM: Open/Inspect Check Valve, 01-SW--773-CKVALV	
		38204225062	Work Order 38204225062, PM: Open/Inspect Check Valve, 01-SW--778-CKVALV	
		38204228026	PM: Valve Replacement, 01-CH--76-CLVALV	
		38204228027	PM: Valve Replacement, 01-CH--92-CKVALV	
		38204228029	OM: Valve Replacement, 01-CH--116-CKVALV	