



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 4, 2019

Mr. Daniel G. Stoddard
Senior Vice President and
Chief Nuclear Officer
Innsbrook Technical Center
5000 Dominion Blvd
Glen Allen, VA 29060

SUBJECT: SURRY POWER STATION, UNITS NOS. 1 AND 2 - REPORT FOR THE
OPERATING EXPERIENCE REVIEW AUDIT REGARDING THE SUBSEQUENT
LICENSE RENEWAL APPLICATION REVIEW (EPID NOS. L-2018-RNW-0023
AND L-2018-RNW-0024)

Dear Mr. Stoddard:

By letter dated October 15, 2018 (Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML18291A842), as supplemented by letter dated January 29, 2019 (ADAMS Accession No. ML19042A137), the Virginia Electric and Power Company (Dominion Energy Virginia or Dominion) submitted to the U.S. Nuclear Regulatory Commission (NRC or staff) an application to renew the Renewed Facility Operating License Nos. DPR-32 and DPR-37 for the Surry Power Station, Unit Nos. 1 and 2. Dominion submitted the application pursuant to Title 10 of the *Code of Federal Regulations* Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," for subsequent license renewal. The NRC staff completed its operating experience review audit at the Excel Services Corporation offices in Rockville, Maryland, from December 6 through December 19, 2018, in accordance with the operating experience review audit plan (ADAMS Accession No. ML18319A184). The audit report is enclosed. If you have any questions, please contact me by telephone at 301-415-4084 or by e-mail at Emmanuel.Sayoc@nrc.gov.

Sincerely,

/RA/

Emmanuel Sayoc, Project Manager
License Renewal Project Branch
Division of Materials and License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-280 and 50-281

Enclosure:
Audit Report

cc w/encl: Listserv

SUBJECT: SURRY POWER STATION, UNITS NOS. 1 AND 2 - REPORT FOR THE
OPERATING EXPERIENCE REVIEW AUDIT REGARDING THE SUBSEQUENT
LICENSE RENEWAL APPLICATION REVIEW (EPID NOS. L-2018-RNW-0023
AND L-2018-RNW-0024) DATED March 4, 2019.

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ADAMS Accession No. ML19046A433

***concurring by email**

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DATE	3/4/2019			

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Audit Report

Operating Experience Review Audit

**Surry Power Station, Unit Nos. 1 and 2,
Subsequent License Renewal Application**

December 6 - 19, 2018

**Division of Materials and License Renewal
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission**

Enclosure

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION, DIVISION OF LICENSE RENEWAL

Docket Nos: 50-280 and 50-281

License No: DPR-32 and DPR-37

Licensee: Virginia Electric and Power Company (Dominion Energy Virginia)

Facility: Surry Power Station, Unit Nos. 1 and 2

Location: Rockville, Maryland

Dates: December 6 – 19, 2018

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**Report for the Operating Experience Review Audit
Surry Power Station, Unit Nos. 1 and 2
Subsequent License Renewal Application**

1. Introduction

The U.S. Nuclear Regulatory Commission (NRC or the staff) conducted an audit of Virginia Electric and Power Company's (Dominion Energy Virginia or Dominion) Surry Power Station, Unit Nos. 1 and 2 (SPS or the applicant's), plant-specific operating experience (OpE), as part of the staff's review of the SPS subsequent license renewal application (SLRA) at the EXCEL Services Corporation located in Rockville, Maryland, from December 6 to 19, 2018. The purpose of the audit was for the NRC staff to perform an independent review of plant specific OpE to identify examples of age-related degradation, as documented in the applicant's corrective action program database. The regulatory bases for the audit was Title 10 of the *Code of Federal Regulations*, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," (10 CFR Part 54). The staff also considered the guidance contained in NUREG-2192, Rev. 0, "Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants" (SRP-SLR), dated July 2017, and NUREG-2191, Rev. 0, "Generic Aging Lessons Learned for Subsequent License Renewal (GALL SLR) Report," dated July 2017.

The identified OpE examples will be further evaluated during the staff's subsequent technical review and auditing of aging management programs (AMPs), time limited aging analyses (TLAAs) and aging management review (AMR) line items. The staff's identification and evaluation of pertinent OpE and additional related documentation, provides a basis for the staff's conclusions on the ability of the applicant's proposed AMPs and TLAAs to manage the effects of aging in the period of extended operation.

2. Audit Activities

The following sections discuss the areas reviewed by the staff and identified examples of pertinent OpE.

SLRA AMP B2.1.1, ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: : "cracking," "crack," "leak," "leakage," "flaw," "failure," "degradation," and "weld."

The table below lists the documents that were reviewed by the staff and were found relevant to the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the safety evaluation report (SER).

The table below lists documents that were reviewed by the staff and were found relevant to the audit.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR1065913	ISI AMP Effectiveness Summary	10/16/2017
PIR1079417	ISI Program Self Assessment	02/15/2018
CR357794	Rejectable PT Exam	11/12/2009
CR402204	Unacceptable PT indication	11/03/2010
CR503773	PT Indications Identified during Weld Exam	10/28/2013
CR1076642	Review for Commitments	08/28/2017
CR359010	Weld Not Found in Field	12/20/2009
CR403659	Rejected Weld	11/04/2010

SLRA AMP B2.1.2, Water Chemistry

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "EPRI [Electric Power Research Institute]," "chlorine," "zinc," "conductivity," "dissolved oxygen," "fluoride," and "oxygen."

The table below lists the documents that were reviewed by the staff and were found relevant to the Water Chemistry Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR026004	1A and 1C Steam Generators in Action Level 2 for Sodium	12/01/2007
CR414344	Chemistry Procedure Sampling Requirement Does Not Agree With Each Other	02/18/2011
CR552179	RCS Chemistry Diagnostic Parameter Not Monitored During U2 Start-up	06/19/2014
CR327245	U2 CHG-CC Exceeds Chemical Admin Limits of 9.3pH and 5000ppB for Chlorine	03/17/2009
CR013913	Chemistry Deviations from EPRI Guidelines not Approved by Manager	06/14/2007
CR334669	U1 Lithium is Outside of EPRI Control Band	05/13/2009

SLRA AMP B2.1.3, Reactor Head Closure Studs Bolting

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "Closure Stud."

The table below lists the documents that were reviewed by the staff and were found relevant to the Reactor Head Closure Stud Bolting Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed		
Document	Title	Revision / Date
CR577976	Arc Strike Identified on Reactor Vessel Closure Stud Nut	04/27/2015
CR1016718	Reactor Vessel Closure Stud cannot be examined with Ultrasonic Testing	11/02/2015
CR475382	Reactor Vessel stud #21 requires evaluation of first seven threads	05/16/2012

SLRA AMP B.2.1.4, Boric Acid Corrosion

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "BAC," "boric," "loss of material," "through wall," "wall thin," "wastage," and "wasted."

The table below lists the documents that were reviewed by the staff and were found relevant to the Boric Acid Corrosion Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed		
Document	Title	Revision / Date
CR539461	Vibration observed on high side tubing associated with flow transmitter.	02/11/2014
CR334763	BACC Program Deficiencies	05/13/2009
CR000747	Bolting found degraded during BACCP evaluation	08/30/2006

Document	Title	Revision / Date
CR334766	BACC evaluations do not adequately document independent review	05/13/2009
CR332725	Rejectable VT-3 for bolt inspection.	04/28/2009
CR340044	BACCP evaluations are not always performed when required.	07/01/2009
CR355125	BACCP walkdowns.	10/27/2009
CR485451	BACC leaking approximately 2 DPM.	08/21/2012
CR504064	Follow up BACC inspection performed on valve.	01/30/2013
CR530120	Boric acid on flange piping.	10/23/2013
CR580644	During walkdown boric acid leakage identified on valve.	05/25/2015
SAR002813	Boric Acid Corrosion Control Program (BACCP) Self Assessment	12/17/2014
PIR1005185	Informal self-assessment of license renewal.	02/05/2018

SLRA AMP B2.1.5, Cracking of Nickel-Alloy Components and Loss of Material Due to Boric Acid-induced Corrosion in Reactor Coolant Pressure Boundary Components (PWRs Only)

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "Alloy 600," "Alloy 182," "Alloy 82" "Stress Corrosion Cracking," "PWSCC," "SCC," "BAC," and "Boric Acid Corrosion Control Program."

The table below lists the documents that were reviewed by the staff and were found relevant to Cracking of Nickel-Alloy Components and Loss of Material Due to Boric Acid-induced Corrosion in Reactor Coolant Pressure Boundary Components (Pressurized water Reactors (PWRs) only) Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR351498	Leak-Before-Break Applicability vs. Alloy 600/82/182	Revision 1
CR377579	Alloy 600 Management Plan	Revision 8

SLRA AMP B2.1.6, Thermal Embrittlement of Cast Austenitic Stainless Steel (CASS)

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "Thermal Embrittlement," "CASS," and "Cast Austenitic Stainless Steel," and "Fracture Toughness."

No plant-specific operating experience associated with the AMP B2.1.6, "Thermal Embrittlement of Cast Austenitic Stainless Steel," was noted by the staff during its review.

The staff also audited the description of the SLRA AMP B2.1.6 provided in Section A1.6 Updated Final Safety Analysis Report (UFSAR) supplement. The staff will document its review of relevant operating experience in the SER.

SLRA AMP B2.1.7, PWR Vessel Internals

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "vessel," "internal," and "reactor internal." The staff also reviewed specific condition reports, corrective action reports, inspection reports, evaluations, or work orders referenced in the audit portal for SLRA AMP B2.1.7 that may have included relevant operation experience discussions or evaluations for specified reactor internal components.

The table below lists the documents that were reviewed by the staff and were found relevant to the PWR Vessel Internals Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR344700	Incorporation of MRP-227-A Into Design Basis Per NEI 03-08	08/31/2009
CR324351 (Item 8)	Documentation of Completion of Unit 1 Internals Examination; Justification for Not Inspecting Unit 2 Internals	02/23/2009
CR1037332	Incorporation of MRP-227, Rev. 1 Into Design Basis Per NEI 03-08 (MRP Letter No. 2015-039)	05/12/2016
CR1041877	Evaluate NSAL-16-1, Baffle Former Bolts	07/07/2016
CR425355	Post Baffle Bolt Project Foreign Object Inspection Identified 5 Items on Core Plate (Unit 2 CR)	05/01/2011

Document	Title	Revision / Date
CR435685	Condition of Unit 2 RCCA Guide Cards	07/26/2011
CR547176	Material Deformation Noted on Upper Internals Assembly, Upper Support Plate (Unit 2 CR)	04/30/2014
CR547625	Material Deformation Noted on Core Barrel Assembly, Lower Core Plate (Unit 2 CR)	05/04/2014
CR558051	TB-14-5, Reactor Internals Lower Radial Support Clevis Insert Cap Screw Degradation (Westinghouse Technical Bulletin)	09/09/2014
CR402374	Unit 1 Baffle Bolt Inspection Indications	11/04/2010
CR425323	Unit 2 Baffle Bolt Relevant Indications	05/01/2011
CR547764	Relevant Indications Found on Radial Support Keyway at 270°	05/05/2014
CR1039262	Industry OE on Baffle Bolt Cracking	06/07/2016
CA3035539 (related to CR1041877)	Evaluate NSAL-16-1, Baffle Former Bolts	07/12/2016
CA199817	CA to Operations Documenting Unit 2 Reactor Vessel Foreign Object Inspections	04/30/2011
CA207894 (related to CR435685)	CA to Engineering to Determine and Initiation Enhancements to ET-S-10-0067, Revision 0	07/26/2011
CA213269	CA to Engineering to Determine and Initiation ET-S-10-0067 for Seismic Considerations	09/22/2011
CA282325 (related to CR547176)	CA to Engineering to Evaluate Deformation in Unit 2 Upper Internals Assembly, Upper Support Plate (U-2)	05/02/2014
CA289106 (related to CR558051)	CA to Engineering to Evaluate Westinghouse TB-14-5, "Reactor Internals Lower Radial Support Clevis Insert Cap Screw Degradation"	05/05/2014
CA184568 (related to CR402374)	CA to Engineering for Determining Inspection Frequency for Unit 1 Baffle Bolt C113 (Unit 1 CA Record)	11/11/2010
CA183945 (related to CR402374)	CA to Engineering for Documenting Completion of ETE SU-10-0008 prior core onload. (Unit 1 CA Record)	11/05/2010
CA199944 (related to CR425323)	CA to Engineering to Document ETE SU-2011-0017 approval prior to core reload	05/02/2011
CA199991 (related to CR425323)	CA to Engineering to Develop Inspection Program for Noted Indications for U-1 a.	05/02/2011
CA209676 (related to CR425323)	CA to Engineering to Add Augmented Inspection Program for Baffle Bolts to ER-SU-AUG-101	08/16/2011
CA216460 (related to CR425323)	Document Posting of Procedure Changes in ER-SU-AUG-101, Rev. 6	10/19/2011

Document	Title	Revision / Date
CA282639 (related to CR547764)	CA to Engineering to Evaluate Noted Wear Condition in 270° Radial Keyway in Unit 2	05/07/2014
NNOE000685 (related to CR402374)	NNOE to Engineering (SPS Unit 1 Baffle Bolt Inspection Results)	11/11/2010
NNOE000806 (related to CR425323)	NNOE to Engineering to Document Industry Experience	05/10/2011
ICES Report 253284 (INPO Report)	Document Summary of Westinghouse Technical Bulletin TB-12-5, Westinghouse Downflow Plant Baffle Bolt Degradation	03/07/2012
ICES Report 322895 (INPO Report)	Salem Unit 1 Record Summarizing Site Specific Baffle-Former Bolt Failures	05/03/2016
ICES Report 416600 (INPO Report)	Salem Unit 2 Record Summarizing Site Specific Clevis Insert Bolt Failures	04/30/2017
ETE-SU-2010-0008	Surry Unit 1 Reactor Vessel Baffle Bolt Examination Evaluation	Rev. 0, 11/11/2010
ETE-SU-2011-0017	Surry Unit 2 Reactor Vessel Baffle Bolt Examination Evaluation	Rev. 1, 04/26/2012
ETE-SU-2012-0020	Unit 1 Reactor Vessel Internals – CRGT Guide Cards, CRGT Upper and Lower Flange Welds, and Vessel Hold Down Spring – Startup Evaluation	Rev. 0, 05/22/2012
ETE-SU-2012-0073	Unit 2 Reactor Vessel Internals – CRGT Guide Cards, CRGT Upper and Lower Flange Welds, and Vessel Hold Down Spring – Startup Evaluation	Rev. 0, 11/20/2012
ETE-SU-2013-0050	Unit 1 Reactor Internals Examination – Reactor Core Barrel Weld Exams and Balance of MRP-227-A Examination	Rev. 0, 11/12/2013
ETE-SU-2014-0033	Unit 2 Reactor Internals Examination – Reactor Core Barrel Weld Exams and Balance of MRP-227-A Examination	Rev. 0, 05/16/2016
WO No. 38102881397	Unit 1 – Unit 1 Reactor Baffle Bolt Inspection for License Renewal	Rev. 0, 10/27/2010
WO No. 38102930378	Unit 2 – Unit 2 Reactor Baffle Bolt Inspection	Rev. 0, 03/14/2011
WO No. 38103333712	Unit 2 – Inspection of the Reactor Internals (Components in Lower Internals Package)	Rev. 0, 01/09/2014
WO No. 38103173757	Unit 2 – Inspection of the Reactor Internals (CRGT, Core Barrel and Upper Internals Flange Weld, and Hold-down Spring Component Locations)	Rev. 0, 09/27/2012

SLRA AMP B.2.1.8, Flow-Accelerated Corrosion

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "cavitat," "CHECWORK," erosi," "FAC," "flow accelerated," "flow accelerated corrosion," "flow-accelerated," "flow-assist," "impinge," "min wall," through wall," and "wall thin."

The table below lists the documents that were reviewed by the staff and were found relevant to the Flow-Accelerated Corrosion Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR344096	Prioritize/schedule FAC inspections of small bore susceptible non modeled lines	08/07/2009
CR096595	Main feed pump recirculation piping cavitation erosion, Unit 1	04/23/2008
CR1079939	Surry 2 2017 RO FAC inspection scope did not include FAC components identified by CR1042842	10/04/2017
CR1069186	Internal erosion found on two AS lines	05/18/2017
CR1042842	FAC components previously dispositioned "No Further Inspections" require re-evaluation	07/21/2016
CR1073211	Surry 2017 INPO MRV Report	07/11/2017
CR1016378	Structural damage inside moisture separator reheater.	10/31/2015
CR099404	Wall thinning on mini flow recirculation lines for AFW.	05/17/2008
PIR1026952	FAC Self-Assessment	11/30/2016
CR1038564	Oversight Review Activity	05/26/2016

SLRA AMP B2.1.9, Bolting Integrity

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "bolt," "SCC," "stress corrosion cracking," "crack," "seal cap," "moly," "leak," "corro," "preload," and "loose."

The table below lists the documents that were reviewed by the staff and were found relevant to the Bolting Integrity Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR337885	Lab Analysis Indicates Gland Bolting for 01-SI-HCV-1850 was incorrect	06/11/2009
WO38102544179	Replace Packing Stud(s) and Repack Valve	05/06/2009
CR485200	PWROG MSC has Issued Needed & Good Practice Recommendation per NEI 03-08	08/01/2012
CA242410	CA to Engineering to Determine if Any ASME [American Society of Mechanical Engineers] Class 1 or 2 NSSS Bolted Bonnet Check Valves Have the Subject Encapsulation Devices and Initiate Actions as Required IAW NEI 03-08	08/01/2012
WO38103108113	Valve Replacement	12/12/2012
CR101630	Crack in the Motor Box Bolt Hole	06/17/2008
CR414633	Caustic Leak at Flange Identified as 2-CP-1405, Caustic Dilution Water Check Vlv	02/22/2011
WO38103232832	PM: Inspect the Main Condenser(s)/Condenser Inspection & Repairs	12/10/2013
CR494061	New Bolting Rejected for Damaged Threads	10/31/2012
WO38103093664	Replace Mech Seal IAW DC (02-RC-P-1B)	12/20/2012
CR000229	1-BR-4 Body to Bonnet Leak	08/12/2006
WO38073740802	Tighten Bonnet Bolts	02/08/2008
CR550236	2-CP-DM-1B Outlet Flange Leaking	05/27/2014
CR1015903	Highly Corroded Bolts/Studs on 2-CW-E-1C	10/28/2015
CR559229	Body to Bonnet Leak on 1-RC-PCV-1455A	09/19/2014

SLRA AMP B.2.1.10, Steam Generators

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "indication," "tubesheet," "tube-to-tubesheet," "foreign material exclusion," "secondary side cleaning," "divider plate," "foreign object," and "FOSAR."

The table below lists the documents that were reviewed by the staff and were found relevant to the Steam Generators Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR333167	Electromagnetic permeability partially obstructing eddy current exam.	05/01/2009
CR424807	Steam Generator riser barrel has a hole from J-nozzle erosion.	04/28/2011
CR460580	SG eddy current exams.	01/26/2012
CR495529	Localized degradation for the hot leg channel head.	11/08/2012
CR532220	Steam Generator mirror insulation installation degradation.	11/11/2013
CR547377	Missed eddy current indications.	05/02/2014
CR099528	PWSCC found in tube end of all three SGs.	05/19/2008
CR403610	An indication indicative of ODSCC.	11/13/2010
PIR1030006	Steam Generator Fleet Self Assessment	2017
CR358500	Tube plugging in SG C	11/17/20019

SLRA AMP B2.1.11, Open-Cycle Cooling Water System

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "biofoul," "biological," "clog," "corros," "fouling," "shell," and "silt." The table below lists the documents that were reviewed by the staff and were found relevant to the Open-Cycle Cooling Water System Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR090520	Excessive Pitting inside the endbells of 1-CC-E-1D	02/5/2008
CR118661	Seepage identified at discharge of 1-VS-E-4C	11/13/2008
CR323664	Seepage in valve body	02/16/2009
CR343410	2-SW-S-2B vent may be blocked (SW strainer swap...no water was able to be vented	08/02/2009
CR366628	Engineering to evaluate existing PMs for cleaning three 8" SW headers to MER.	01/27/2010
CR391269	2-OSP-SW-001 Performed Un-Satisfactory	08/14/2010
CR403084	1-BC-E-1A inlet SW pipe has extensive corrosion	11/9/2010
CR403147	1SW-46 has metal loss of 1/4 to 3/8 inch depth (active graphitic corrosion)	11/9/2010
CR403330	Generate WO to replace 1-SW-50 (active graphitic corrosion)	11/10/2010
CR403331	Generated CR to replace 1-SW-42 (active graphitic corrosion)	11/10/2010
CR472275	1-SW-934 repair plan and to track coating repair.	04/25/2012
CR494627	As-found inspection of Unit 2 "C" 48-inch SW supply header	11/3/2012
CR544649	As Found Inspection Result ID Service Water Header	04/11/2014
CR549222	Potential Failure Mode Requires operability review	05/16/2014
CR1015310	2C SW Header as-left	10/24/2015
CR1015777	Degradation 2-SW-REJ-201A	10/27/2015
CR1015784	2-SW-REJ-201B REJ Potential Degradation	10/27/2015
CR1019845	2ASW header inspection results with attachments	11/28/2015
CR1046143	1-SW-S-10 Piping needs WO for programmatic cleaning	09/01/2016

Document	Title	Revision / Date
CR1070325	2C SW Header As-Found Dive Inspection	05/31/2017

SLRA AMP B2.1.12, Closed Treated Water Systems

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "biological," "chloride," "clog," "cooler," "corros," and "min wall." The table below lists the documents that were reviewed by the staff and were found relevant to the Close Treated Water Systems Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed		
Document	Title	Revision / Date
CR003960	Recirc spray piping replacement testing.	11/08/2006
CR005310	1-CC-E-1C macrofouling in 4-5 weeks	12/07/2006
CR479498	CH CC pipe wall loss and corrosion deposits	06/21/2012
CR483008	U2 Charging CC Suction Piping Replacement	07/26/2012
CR487853	Replace U1 CH CC Suction Piping	09/12/2012
CR565668	18-CC-229-121 line below min wall thickness at pipe support	11/18/2014
CR1022848	Peeled away coating clogging 1-CC-E-1C inlet tubes	01/04/2016
CR1051543	CC leak in containment at pipe penetrations coolers	10/24/2016

SLRA AMP B2.1.13, Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "crane," "bolt," "corro," "fatigue," "degrad," "stud," "loose," "crack."

The table below lists the documents that were reviewed by the staff and were found relevant to the Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR1054974	New Fuel Crane Paint & Preservation	12/02/2016
CR1073809	Request WO for ½-FH-CRN-5 Aging Management Crane Inspection	07/18/2017
CR1071593	This is an NOD Audit Finding, 17-04-03S	06/15/2017
CA3060162	NOD to Initiate Actions as Required to Disposition Audit Finding 17-04-03S IAW NO-AA-102	06/19/2017
CR1068682	Aging Management Activities are Not Conducted IAW Program Requirements	05/15/2017
CR1063146	Sheared Crane Rail Mount Stud on 1-FH-CRN-13	03/24/2017
CA3053762	CAART Directed Assignment: D&I to Address Concerns With Sheared Crane Rail Mount Stud on 1-FH-CRN-13	08/11/2017
WO38103804873	Perform Repairs IAW ENG Direction	07/13/2017

SLRA AMP B2.1.14, Compressed Air Monitoring

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "air," "aging," "moist," "chlorine," "dew," and "instrument."

The table below lists the documents that were reviewed by the staff and were found relevant to the Compressed Air Monitoring Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR347728	1-IA-D-3 failed unsat for system pressure dew point	09/09/2009
CR362110	2-IA-33 failed unsat for system pressure dew point	12/16/2009
CR418673	Low level IA Dryer Dew Point Failure	03/22/2011
CR406913	Low Level Air Dryer 1-IA-D-3 Failed on Quarterly Dew Point Check	12/09/2010

Document	Title	Revision / Date
CR418239	Low level IA Dryer Dew Point Failure 0-CSP-IA-004	03/18/2011
CR090509	Moisture Trap 2-IA-TD-48 clogged at 2-IA-D-48	02/05/2008

SLRA AMP B.2.1.15, Fire Protection

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "penetration seal," "fire door," "fire wall," "fire damper," "insulation," "combustible," "halon," "carbon dioxide," and "fire suppression."

The table below lists the documents that were reviewed by the staff and were found relevant to the Fire Protection Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR1084941	Engineering was asked to inspect a passive fire barrier along the south wall, which showed a whole completely through a box.	11/29/2017
CR1085782	A fire barrier that protects discharge piping was identified as breached (CR1084941). Pictures reveal corrosion at the location of the fire barrier failure. A work order was created to remove portions of the barrier and inspect the piping and supports with appropriate contingency plans.	12/12/2017
CR581450	The first floor double doors in the admin building will not secure in the event that the fire alarm system automatically released the doors. A supervisor was notified of safety and loss prevention.	06/04/2015
CR575355	Fire resistive testing and qualification documentation were not found to prove to an NRC inspector that a masonry wall was a qualified 3-hour rated fire barrier. Penetration seals were also noted as not having a controlled manner of verifying the adequacy of the seals.	03/27/2015
CR572510	Door will not latch completely when opened a normal distance. Door was deadbolted and declared functional as a fire barrier and gas barrier	02/24/2015

Document	Title	Revision / Date
CR565907	A fire barrier penetration did not have the required semkit foam seal installed. The penetration does not have an actual location number.	11/20/2014
CR544364	Penetration between the Unit 2 normal switchgear room and the Unit 2 turbine building contains a one-inch steel conduit grouted into the block wall with a pull box on each side of the wall. An inspection showed that no foam was installed in the conduit through the wall. In this condition, the penetration would not have performed its function as a 3-hour rated fire barrier. Once new cables are pulled in, foam will be installed in the conduit as part of the modification package.	04/09/2014
CR540746	Appendix R penetration is not sealed. Cables currently installed are spares and are scheduled to be removed to permit installation of new cabling, which will then be sealed.	02/25/2014
CR540963	Corrective Action 278440 was assigned to engineering to determine and initiate required actions and to perform and extent of condition walkdown based on penetration documented in CR540746. One similar penetration in Unit 2 was identified without sealant inside the conduit, but no other penetrations of this type were noted in either unit.	02/27/2014
CR491395	The fire barrier penetration between the Unit 1 Cable Tunnel and Cable Vault, in the cable trays area is not in compliance with the station fire barrier requirements. The requirement is to have 10 inches of fire material in the penetration to achieve a 3-hour fire barrier. The wall is 6 inches thick and the material in the wall penetration is also 6 inches. An additional 4 inches of material is required by procedure.	10/12/2012
CR024815	The foamed piping penetration in the wall between the MSVH and CSPH is not shown in the Technical Requirements Manual (TRM) as a fire barrier. A door that penetrates the same wall is shown as a balance of plant fire door. It is unclear if the piping penetration is a fire barrier. Recommended corrective action is to determine the correct classification of the door, wall, and foamed penetration, and initiate any changes.	11/13/2017

Document	Title	Revision / Date
CR106695	While inspecting the auxiliary building and cable vault pipe tunnel fire barriers for extent of condition relative to CR106369, a hydrogen analyzer line was found that could be potentially similar. Work order is needed to remove insulation and check penetration fire barrier.	08/21/2008
CR106369	A fire seal was breached in between the Unit 2 cable tunnel and portion of the auxiliary building during a walkdown.	08/19/2008
CR322632	Required inspections were not performed during fire barrier repair	02/05/2009
CR1087926	Skins on fire door are failing and allowing the door to flex. The insulation material inside has become damaged and falling out of the seams due to movement.	01/16/2018
CR1074953	Fire Protection/Appendix R Health Report overall rating is white for the second quarter of 2017 with several Yellow and Red Health attributes. The Red attribute is that an Appendix R fire door has excessive gap under the active door leaf, and is non-functional. Due to vendor measurement discrepancies, multiple attempts to install the new door leaf have been unsuccessful.	08/03/2017
CR119988	Monthly Fire Door Inspection was completed UNSAT because two doors are locked/blocked closed for known issues.	11/23/2008
CR1006002	Halon cylinder was discovered to be 4 pounds below the minimum weight per the test requirements.	08/11/2015
CR1006004	Spare halon cylinder was discovered indicating 0 gauge pressure. This cylinder was returned to Surry Power Station from the vendor on 08/05/2015 after being hydro tested at their shop. It was previously verified satisfactory for overall weight (605 pounds) and pressure (450 psi [pounds per square inch]) upon return from the vendor on 08/05/2015.	08/11/2015

Document	Title	Revision / Date
CR1015731	Emergency switchgear room fire damper associated with the halon system located in the dividing wall was found tripped. The two dampers located in the dividing wall were inspected as an extent of condition when the rest of the fire dampers tripped under CR1014895	10/27/2015
CR527809	There have been multiple occurrences of emergency switchgear room fire dampers and the fire door spuriously repositioning, requiring operator action. Responding to this condition requires investigation and evaluation of the fire suppression system functionality, and an evaluation for Appendix R and TRM compliance.	10/01/2013

SLRA AMP B2.1.16, Fire Water System

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "aging," "biofoul," "blister," "block," "break," "clog," "corros," "damage," "fail," "flow restrict," "foul," "leak," "recur," "rupture," "sprinkler," "tank," and "through wall." The table below lists the documents that were reviewed by the staff and were found relevant to the Fire Water System Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR380377	The sensing line upstream of a main drain gauge isolation valve is clogged as evidenced by the static and dynamic pressure reading being the same.	05/08/2010
CR393845	A drain on unit 1 south side turbine building is clogged. Subsequent condition report, 398027 (10/06/2010), confirmed that blockage was not downstream of the drain valve.	09/08/2010
CR480051	Extensive corrosion was detected at a 2-inch elbow in the vicinity of hose rack 20.	06/02/2012
CR485286	Deposits of brown reddish sediment were detected inside an elbow in the vicinity of 1-FP-282.	08/18/2012

Document	Title	Revision / Date
CR556879	Twenty five percent of the diesel driven fire water pump normal cooling water strainer is clogged. Less than five percent of the bypass cooling water strainer is clogged.	08/25/2014
CR1089670	A loop seal prevents deluge piping downstream of 1-FP-DL-28 from draining.	02/08/2018
CR1089673	A loop seal prevents deluge piping downstream of 1-FP-DL-17 from draining.	02/08/2018
CR316728	Blistering was detected in the internal coatings on the bottom and side walls of the fire protection/domestic water storage tank (FWST) 1A.	12/22/2008
CR318515	Extensive surface corrosion was detected on the external surfaces of the bottom two feet of FWST 1A.	12/31/2008
CR318521	Extensive surface corrosion was detected on the external surfaces of the bottom two feet of FWST 1B.	12/31/2008
CR325572	Inspections of FWST 1A and FWST 1B revealed corrosion on the bottom plate and sides.	03/05/2009
CR514139	Indications of general corrosion were detected on the bottom two feet of FWST 1A and FWST 1B.	05/02/2013
CR540390	Thirty locations on FWST 1A exhibited plate thinning exceeding 10 percent of the nominal wall thickness.	02/21/2014
CR553861	The internal coating on FWST 1B exhibited peeling on the tanks walls above the water line and the ceiling. Some blistering was noted below the waterline.	08/11/2014
CR556901	Forty-six locations on FWST 1B exhibited plate thinning exceeding 10 percent of the nominal wall thickness.	08/25/2014
CR564447	Pitting and coating blistering were detected on the floor of FWST 1B.	11/05/2014
CR28598	A through-wall leak was identified in the vicinity of hose reel 30; 4 drops per second (dps).	01/11/2008
CR103488	A through-wall leak was identified between 1-FP-243 and 1-FP-250 on the 8-inch supply header to the unit 1 main and station transformer.	07/13/2008

Document	Title	Revision / Date
CR316119	A through-wall leak was identified downstream of 1-FP-383.	12/08/2008
CR320164	A through-wall leak was identified in a 6-inch supply line.	01/15/2009
CR368386	An internal inspection of 10-inch fire protection piping in the turbine building revealed pitting and nodules.	02/10/2010
CR408234	Suspected leakage was identified downstream of the isolation valve for the fire protection header to the training building.	12/21/2010
CR441171	A through-wall leak was identified in the vicinity of 1-FP-364.	09/02/2011
CR458330	A through-wall leak was identified in a unit 1 turbine building 2-inch fire water supply line.	01/08/2012
CR536491	A sprinkler line break occurred in the south side of the unit 1 turbine basement in the vicinity of 1-FP-247.	08/28/2014
CR1064984	A through-wall leak was identified in a unit 1 deluge valve drain line; 4 dps.	02/21/2015
CR557202	Repair alignment issues occurred for a piping repair, potentially as a result of the pipe break which initiated the repair.	08/28/2014
CR576447	The internal inspection of 1-FP-14 revealed pitting, crevice corrosion, and possibly flow accelerated corrosion on both the inlet and outlet piping.	04/10/2015
CR1064984	A through-wall leak was identified upstream of the isolation valve for hose rack 56; 1 gallon per minute.	04/11/2017
CR1071799	A through-wall leak was identified on piping to hose reel 57.	06/19/2017
CR1076156	A through-wall leak was identified from the retard chamber drain line for 1-FP-DL-27; 150 milliliters per minute.	08/21/2017
CR1085645	A through-wall leak was identified upstream of hose rack 48; 2 drops per minute (dpm).	12/10/2017
CR1087698	A possible water leak from the fire sprinkler system was identified in warehouse 8.	01/11/2018

Document	Title	Revision / Date
CR105806	Surface water was detected near fire hydrant adjacent to the training center parking lot.	08/12/2008
CR329250	Surface water was detected at the north east corner of a construction site laydown area within 100 feet of 1-FP-1046.	03/31/2009
CR330747	Surface water was detected in the vicinity of the station training center.	04/13/2009
CR345000	Surface water was detected in the vicinity of post indicating valve 01-FP-86.	08/16/2009
CR456235	Surface water was detected in the vicinity of fire hydrant 1-FP-708.	12/14/2011
CR470098	Surface water was detected in the vicinity of 1-FP-100.	04/11/2012
CR474655	Surface water was detected in the vicinity of post indicating valve 1-FP-1024.	05/10/2012
CR477285	Surface water was detected in the vicinity of hose house 29.	05/31/2012
CR497754	Surface water was detected in the vicinity of curb box valve 1-FP-1010.	11/24/2012
CR498946	Surface water was detected in the vicinity of post indicating valve 1-FP-49.	12/03/2012
CR504380	Surface water was detected in the vicinity of 1-FP-1027.	02/03/2013
CR510828	Surface water was detected in the vicinity of post indicating valve 1-FP-35.	04/11/2013
CR538837	Surface water was detected in the vicinity of the curb box near 1-FP-70.	02/04/2014
CR553533	Surface water was detected in the vicinity of hose house 13.	07/09/2014
CR556008	Surface water was detected in the vicinity of 1-FP-535.	08/13/2014
CR580443	Surface water was detected in the vicinity of 1-FP-542	05/22/2015
CR1019199	Surface water was detected in the vicinity of 1-FP-321	11/21/2015

Document	Title	Revision / Date
CR1079710	Surface water was detected in and around fire hose house 31; less than one gallon per hour.	10/02/2017
CR1086752	Surface water was detected in the vicinity of 1-FP-379; by the training center.	12/28/2017
CR1087963	Surface water was detected between 1-FP-124 and 1-FP-519	01/16/2018
CR002099	A sprinkler head is leaking at west end of unit 2 condenser; 40 dpm.	10/05/2006
CR007510	A sprinkler head in the laundry building is spraying a fine mist.	02/12/2007
CR485731	Corrosion was detected on a sprinkler in the chemistry primary hot lab.	08/22/2012
CR496505	A sprinkler head is leaking in the turbine building; 10 dpm. Subsequent condition report, 497330 (11/20/2012), stated that the leak had increased to 2 dps.	11/14/2012
CR497330	A sprinkler head is leaking in the unit 2 turbine building; 2 dps.	11/20/2012
CR503979	A unit 2 turbine building sprinkler head is spraying water.	01/29/2013
CR1080728	A sprinkler head above unit 2 air ejector failed.	10/13/2017

SLRA AMP B2.1.17, Outdoor and Large Atmospheric Metallic Storage Tanks

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "corrosion," "crack," "pinhole," "leak," "tank," "blistering," "coating," and "wall thickness."

The table below lists the documents that were reviewed by the staff and were found relevant to the Outdoor and Large Atmospheric Metallic Storage Tanks Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR514136	Insulation underneath protective covering of Fire Protection Domestic Water Storage Tank was moist.	05/02/2013
CR1044007	The recirculation line on the Refueling Water Storage Tank was missing a portion of insulation near the top of the tank.	08/04/2016
CR479414	A large void was found in exterior concrete surface of the Emergency Condensate Storage Tank. The void appears to be from a piece of wood that was embedded in the concrete surface and previously removed.	06/20/2012
CR178979	A corrective action was sent to Engineering to address 10 CFR 54.4(a)(2) and initiate actions to determine if piping meets the requirements in 10 CFR 54.37b.	02/23/2011
CR510027	Work order for inspection of RWST 2-CS-TK-1	04/04/2013
CR510031	Work order for inspection of RWST 1-CS-TK-1	04/04/2013
CR518493	Emergency Condensate Storage Tank local indicator reading in error.	06/17/2013
CR543269	Surry Power Station committed to inspecting Unit 2 Refueling Water Storage Tank in accordance with American Nuclear Issues Guideline 07-01, which requires tank interiors to be periodically inspected (including tank bottom, shell plates, roof plates, pipe connections, welds, and coatings).	03/27/2014
CR514142	Vegetation was noted growing underneath insulation during a walkdown of the Fire Protection Water Storage Tanks.	05/02/2013
CR318515 CR318521	Bottom 2 feet of the subject Fire Protection Domestic Water Tank was buried in soil for an extended period of time. Upon excavation, it was revealed that the area previously buried has no protective coating and corrosion is occurring.	12/31/2008
CR002934	Unit 2 Chemical Addition Tank level began to decrease.	10/21/2006

Document	Title	Revision / Date
CR423485	To fulfill a license renewal commitment, 1-FP-TK-1B was visually inspected using ultrasonic testing (UT). Some corrosion was found on the bottom side of the bottom plate via UT. The issue is summarized in CR325572.	04/20/2011
CR325572	The bottom coating of 1-FP-TK-1B is blistered, but intact with no indication of corrosion on top of the bottom plate. The inside walls have some coating failure.	03/05/2009
CR317397	During UT of 1-CN-TK-1, foreign material was discovered in 2 locations.	12/17/2008

SLRA AMP B.2.1.18, Fuel Oil Chemistry

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "fuel oil," "MIC," "microbiologic," "tank," "biofuel," "biological," "bacterial," and "biodiesel."

The table below lists the documents that were reviewed by the staff and were found relevant to the Fuel Oil Chemistry Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR009031	Diesel fuel oil issues identified during RCE27 investigation	03/21/2007
CR014915	Fuel oil pump house, sump pumps, water intrusion, flooding	06/28/2007
CR344349	Critical observation of chemistry EDG #2 sampling	08/10/2009
CR057720	Unknown material found in AAC fuel oil filters	03/11/2013
CR554108	Foreign material in new fuel oil tank 1-FP-TK-4	07/16/2014
CR1011699	Ten Year PMs to Clean and inspect fuel oil tanks were deleted	10/01/2015
CR511830	Debris identified within AAC primary fuel oil filters	06/04/2013

Document	Title	Revision / Date
CR517334	Evaluate condition of 1-FP-TK-4, 1-FP-P-2 fuel oil tank	06/04/2013
CR390322	Water layer detected in fuel oil tank.	08/05/2010
CR003949	Fire protection diesel day tank requires cleaning.	11/07/2006
CR492073	EDG biodiesel preparedness.	10/17/2012
CR526769	Fire protection diesel day tank requires cleaning.	09/21/2013
CR554108	Foreign material in new fuel oil tank 1-FP-TK-4.	07/16/2014
CR522766	Water found in 1-EE-TK-2B.	08/08/2013
ETE-SU-2011-0070-API-653	Diesel tank inspection summary.	Revision 0
PIR1005185	Fuel oil self-assessment	12/10/2015

SLRA AMP B2.1.19, Reactor Vessel Material Surveillance

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using these keywords: "embrittle," "brittle," "capsule," "surveillance," "astm," "integrated," "toughness," "ferri," "rpv," , "rv," and "vessel." The staff also reviewed condition reports and any associated corrective action reports referenced in the audit portal for SLRA Section B2.1.19, "Reactor Vessel Material Surveillance."

The table below lists the documents that were reviewed by the staff and were found relevant to the reactor pressure vessel (RPV) material surveillance described in SLRA Section B2.1.19. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR362195	Unit 1 Vessel Surveillance, 1-PT-4.0	12/16/2009
CR579127	Unit 2 RV Heat Number Discrepancies	05/08/2015

The staff acknowledges that, in addition to the above CRs, operating experience related to the RPV surveillance program (which is based on the requirements 10 CFR Part 50, Appendix H) is summarized in RPV surveillance reports that are generated in accordance with the reporting requirements in the 10 CFR Part 50, Appendix H. The staff's in-house audit report input for SRLA Section B2.1.19 identifies the applicable RPV surveillance capsule reports.

SLRA AMP B2.1.20, One-Time Inspection

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "blister," "break," "clam," "coat," "corro," "crack," "damage," "delamin," "fail," "flaw," "hole," "holiday," "rust," and "scal."

The table below lists the documents that were reviewed by the staff and were found relevant to the One-Time Inspection Program. These documents were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR438418	Through-wall leaks in carbon steel piping	08/12/2011
CR549183	Metal flaking inside carbon steel piping	05/16/2014
CR563677	Discharge carbon steel piping to the inlet canal was found pitted beyond repair	10/29/2014
CR580786	Oil leak from carbon steel piping sensing line	05/27/2015
CR1019835	Through-wall leak of CW inlet piping from galvanic corrosion between SS valve and CS flange	11/28/2015
CR1025969	Fish screen carbon steel piping has through-wall holes from corrosion from brackish water	02/02/2016
CR1051990 CR1052010	Corrosion of 1" carbon steel piping in CC water system was noted during license renewal inspection	10/27/2016

SLRA AMP B2.1.21, Selective Leaching

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "bronze," "graphiti," "dealloy," "zinc," "leach," "dealum," and "cast."

The table below lists the documents that were reviewed by the staff and were found relevant to the Selective Leaching Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR443965	Work Order to Perform Inspection of 38-01-SW-183 valve	09/21/2011
CR444706	Work Order to Perform Inspection of 38-00-SW-183 valve	09/26/2011
CR444710	Work Order to Perform Inspection of 38-00-PL-12 valve	09/26/2011
CR566581	Bronze pipe plug 2-CP-S-5 Filter Has through wall leak	12/02/2014
CR444773	Work Order to Perform Inspection of 38-02-SW-ICV-3048 valve	09/26/2011
CR452774	Work Order to Perform Inspection of 38-01-CP-82 valve	11/15/2011
CR500597	Work Order to Perform Inspection of 38-00-BSA-LU-1-Mechan valve	12/20/2012
CR500614	Work Order to Perform Inspection of 38-00-BLO-12 valve	12/20/2012
CR500617	Work Order to Perform Inspection of 38-02-PL-12 valve	12/20/2012

SLRA AMP B2.1.22, ASME Code Class 1 Small-Bore Piping

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "fatigue," "fatigue cracking," "thermal fatigue," "stress corrosion," "PWSCC," "SCC," and "small bore."

The table below lists the documents that were reviewed by the staff and were found relevant to the ASME Code Class 1 Small-Bore Piping Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed		
Document	Title	Revision / Date
CR002804	Drain Line at Tee on 2-SI-PI-200 Leaked When the System Was Pressurized	10/19/2006
CR003283	Piping (Small Bore) and Support (2-DG-18) in "A" loop bent next to 2-RH-MOV-2700"	10/26/2006
CR003402	Radiography Reject of 2-SI-MOV-2867C, Three Indications, Weld Repaired and Passed	10/28/2006
CR353510	Weld Leak on 2-RH-33	10/19/2009
CR402204	Unacceptable PT Linear Indication Found during ASME Section XI ISI Weld Exam	11/03/2010
CR402568	Indication on SI Line during ISI Exam, Unit 1	11/05/2010
CR423990	Flow Accelerated Corrosion (FAC) in Small Bore Piping	04/23/2011
CR491984	I-SI-P-2 Seal Leakage While Pump is Isolated	10/16/2012
CR531555	NDE Linear Indications on 2 inch SI-73-1503 Weld 1-27 During ISI Examination	11/04/2013
CR551332	IER L4-14-30 Analysis of Vibration Induced Piping and Tubing Leaks (2010-2013)	06/10/2014
CR579624	SPC U1 RCS Drain Line Thermal Fatigue Inspection Assessment	05/14/2015
CR577754	Indications on "B" Cold Leg Drain Line	04/24/2015
CR579624	SPS U1 RCS Drain Line Thermal Fatigue Inspection Assessment, Less Than 90% Coverage	05/14/2015

SLRA AMP B2.1.23, External Surfaces Monitoring of Mechanical Components

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "corros," "cracking," "jacket," "leak," "rust," "scale," "ammonia," and "copper."

The table below lists the documents that were reviewed by the staff and were found relevant to the External Surfaces Monitoring of Mechanical Components Program. These documents were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR001977	Removed insulation from CC coolers and found advanced corrosion	10/2/2006
CR002938	Many examples of rusted piping, some heavily	10/21/2006
CR025704	Four CW loop drain valves externally corroded	11/28/2007
CR025803	Boric acid leakage on piping insulation	11/29/2007
CR099000	Stress corrosion cracking on outlet nozzle of residual heat removal heat exchanger	05/14/2008
CR388637	Condition Monitoring of AMP	07/21/2010
CR388637	AMP program inspection report	07/21/2010
CR403084	SW piping (inlet) has extensive corrosion	11/9/2010
CR424720	NRC license renewal (LR) inspector found general corrosion of CC water piping	04/27/2011
CR500594	External surfaces inspection of copper pipe exposed to air has potential aging effect of cracking	12/20/2012
CR500599		12/20/2012
CR500606	Cu-Ni pipe exposed to air could crack	12/20/2012
CR500607	Cu-Ni pipe exposed to air could crack	12/20/2012
	Cu-Ni pipe exposed to air could crack	12/20/2012
CR103891	Loss of material and surface rust on chiller piping	04/05/2016
CR1052010	NRC license renewal (LR) inspector noted corrosion on a carbon steel pipe in cooling jacket 1-CC-E-3B	10/27/2016
CR1052023	LR Inspection of 1-CC-888 and associated piping noted corrosion	10/27/2016
CR1052026	LR inspection of 1-CC-964 and 6"CC-75-151 noted flaking and rusting	10/27/2016
CR1052034	LR inspection of CC bolting noted corrosion	10/27/2016

Document	Title	Revision / Date
CR1052035	LR inspection of CC piping noted corrosion	10/27/2016
CR1052038	LR inspection of CC pipe union noted corrosion	10/27/2016

SLRA AMP B2.1.24, Flux Thimble Tube Inspection

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "wear," "thimble tube," and "flux." The staff also reviewed condition reports or corrective action reports referenced in the audit portal for SLRA AMP B2.1.24, "Flux Thimble Tube Inspection."

The table below lists the documents that were reviewed by the staff and were found relevant to the Flux Thimble Tube Inspection Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR1051570	Scraping and Scratch Indications on Unit 2 D7 Flux Thimble Tube	10/24/2016
CR1051569	Through-Wall Pin Hole in Unit 1 Thimble Tube B7 (Outer Tube Wall)	12/24/2016
CR547625	Material Deformation Noted on Core Barrel Assembly, Lower Core Plate (Unit 2 CR)	05/04/2014
CA3043346 (Related to CR1051569 and CR1051570)	CA to Engineering for Evaluation of Indications in Unit 2 D7 Flux Thimble Tube	10/28/2016
CA199817	CA to Operations Documenting Unit 2 Reactor Vessel Foreign Object Inspections	04/30/2011

SLRA AMP B2.1.25, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "aging," "biofoul," "piping," "leak," "microbiologic," "wall thin," "wall loss," "through wall," and "loss of material."

No significant plant-specific operating experience associated with the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program was noted by the staff during its review.

SLRA AMP B2.1.26, Lubricating Oil Analysis

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "lubricating oil," "lube," "LO," and "sample."

No significant plant specific operating experience associated with the Lubricating Oil Analysis Program was noted by the staff during its review.

SLRA AMP B2.1.27, Buried and Underground Piping and Tanks

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "aging," "buried," "coat," "corro," "wrap," "vault," "underground," "microbiologic," "loss of material," "holiday," "flaw," "excavat," "galvanic," "chloride," "wall loss," "wall thin," and "leak."

The table below lists the documents that were reviewed by the staff and were found relevant to the Buried and Underground Piping and Tanks Program. These documents were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR006624	Buried auxiliary feedwater (AFW) piping is not examined on a periodic basis to assess its condition	01/22/2017
CR011232	Emergency diesel generator (EDG) fuel oil lines have passive cathodic protection installed but no PMs to test	04/26/2007
CR105973	Coating failures identified during buried piping inspection	08/13/2008
CR1068527	Underground piping program inspection revealed missing coating	05/13/2017
CR114414	Buried fire protection (FP) leak discovered	10/16/2018
CR385883	Pitting identified in pipe wall during Buried Pipe Program inspection	06/25/2010
CR386494	Surface pitting found on excavated piping	06/30/2010
CR441171	Through wall leak discovered in FP pipe	09/01/2011
CR442030	Underground/buried pipe leakage	09/08/2011
CR480972	Buried condensate (CN) line leak	07/06/2012
CR497540	Two pin hole leaks in buried CN line	11/22/2012
CR1068384	Underground piping program inspection revealed missing coating	05/11/2017
CA126782	CA to engineering to evaluate the adequacy of the cathodic protection systems	01/21/2009

SLRA AMP B2.1.28, Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "blister," "coat," "delam," "flak," "flaw," "holiday," "leak," "lined," "lining," "peel," "spall," and "tank."

The table below lists the documents that were reviewed by the staff and were found relevant to Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks Program. These documents were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR003120	Unit 2 96-inch diameter inlet circulating water (CW) piping corrosion and coating failures	10/23/2006
CR325572	Documentation of tank inspection results	03/05/2009
CR316728	Coating on the inside of 1-FP-TK-1A	12/11/2008
CR004559	Liner/coating failures and corrosion damage in Unit 2 water boxes	11/09/2006

SLRA AMP B2.1.29, ASME Section XI, Subsection IWE

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "bellows," "blister," "bolt," "chase," "containment," "corros," "coat," "crack," "degrad," "fatigue," "IWE," "leak," "liner," "loss of material," "pit," "rust," "SCC," "through wall," and "moisture barrier."

The table below lists the documents that were reviewed by the staff and were found relevant to the ASME Section XI, Subsection IWE Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR1017925	U2 Areas with degraded coatings were identified in the concrete-liner interface (along back of containment sump)	11/10/2015
CR1019840	U2 Containment Liner require Coating Repairs in the containment sump	11/28/2015

Document	Title	Revision / Date
CR1068179	U2 Degraded liner coating at containment sump concrete-liner interface	05/10/2017
CR356642	U2 containment liner with coating damage	11/05/2009
CR1051463	U1 IWE Liner Inspection found coatings damage requiring attention	10/24/2016
CR546261	U2 Containment Liner Coatings Repairs - 2R25	04/24/2014
CR496900	U2, Arc strikes and weld spatter on containment liner wall	11/17/2012
CR480271	U1 For RFO 1R25 – Various areas of U1 containment liner require coating repairs.	06/28/2012
CR428070	U2 containment liner inspection found blistered paint area 6"x24"	05/21/2011
CR424719	NRC inspector identified general corrosion issue during containment walkdown in the MFW penetration area [CA 200353]	04/27/2011
CR548520	IN 2014-07: Degradation of Leak Chase Channel Systems for Floor Welds of Containment Metal shell and Metallic Liner [CA293562 & CA283112]	05/11/2014

SLRA AMP B2.1.30, ASME Section XI, Subsection IWL

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keyword: "containment," "concrete," "tendon," "grout," and "IWL."

The table below lists the documents that were reviewed by the staff and were found relevant to the Structures Monitoring Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR001881	U2 Containment ASME Section XI, Subsection IWL exterior concrete anomalies	09/27/2006
CR003924	Unit 2 Containment Structure – Visual Exam, ASME Section XI, Subsection IWL	11/04/2006
CR1040303	Work Order requested to repair U2 Containment Concrete	06/17/2016
ET-S-06-0136	02-BS-BLD-CONT-BLDG CONTAINMENT STRUCTURE REPAIR PLAN & EVALUATION	Revision 4
CR438612	Unit 2 Containment concrete repairs not performed	08/19/2011
CR024233	Unit 1 containment inner annulus wall has spalled concrete	11/06/2007
CR488024	Follow on Inspection results for Unit 2 containment concrete void	09/12/2012
CR483271	Suspect areas found during Unit 1 Containment IWL Inspection	07/30/2012
CR434317	Residue on Wall of 2-CN-TK-1	07/14/2011
CR1053286	1-VS-S-1B Concrete Pedestal Degradation	11/09/2016
CR1018296	Engineering Inspection of Bottom Side of ESPH (efflorescence)	11/13/2015
CR392547	Aging Management Inspection Do Not meet License Renewal Expectation	08/26/2010
CR099599	Documentation of Degraded Support	05/20/2008

SLRA AMP B2.1.31, ASME Section XI, Subsection IWF

Audit Activities. The staff conducted an independent search of Dominion’s operating experience database using keywords: “IWF,” “Support,” “Hanger,” “Neutron Shield Tank,” and “VT-3.”

The table below lists the documents that were reviewed by the staff and were found relevant to the ASME Section XI, Subsection IWF Program. These documents were provided by Dominion or were identified in the staff’s search of Dominion’s operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR099008	U2, Neutron Shield Tank, sampled every RFO. Sampled at different times on 5/14/2008 yielded chloride concentration of 620 ppb and 690 ppb. Action level 1 limit is < 150ppb. Previous 4 outages show chloride concentration at 100 ppb.	Revision 0 05/14/2208
CR1005646	U2, Neutron Shield Tank level is lowering, tank was filled to 80% on 05/28/2014, currently at 17%.	Revision 0 08/07/2015
CR332711	U1, Neutron Shield Tank in Action Level 1 for chloride and fluoride.is 150 ppb. Sample obtained on 04/28/2009 had chloride and fluoride concentrations at 311 ppb and 301 ppb, respectively. Previous two outages were at 100 ppb and 150 ppb respectively.	Revision 0 04/28/2009
CR358061	U2, Neutron Shield Tank remains in Action Level 1 for chloride. Current chloride concentration 742 ppb. CA075275 documents Chemistry Technical Report CH-08-001 (Rev 0) to support continuous operation of U2 NST cooling water system with implementation of REA 2007-2009 during RFO23.	Revision 0 11/14/2009
CR479576	U2, Neutron Shield Tank Detector Well Leakage. Issue was identified in 1989 (reference DR S97-2749 concluded that the NST could perform its function for over 15 years with existing leaks – locations have yet to be determined, S-93-0340).	Revision 0 06/21/2012
CR494734	U2, Neutron Shield Tank Detector Well Leakage states that potential leaks are likely due to failed welds on the vent shroud structure for the neutron detector enclosure tube in the internals of NST.	Revision 0 11/03/2012
CR530267	U1, Loose Bolt Identified in Reactor Vessel Support – on B loop hot leg following VT-3 examination. ISI program identifies this support as 1-RC-PAD-5 on ISI DWG 11448-WMKS-RC-R-1.1 (engineering discovery activity ID S1.F1.40.088); CA272041 Engineering to determine and initiate required action.	Revision 0 10/24/2013
CR532703	U1, Sliding foot support 1-RC-PAD-5 on B loop hot leg rejectable condition during the ASME XI examination due to loose cap screw – condition reviewed during the U1, NRC ISI inspection.	Revision 0 11/15/2013
CR579397	Pipe Hanger rejected During ISI VT-3 Examination – as found load outside the designed cold-load setting by 300 pounds.	Revision 0 05/02/2015
CR099599	U2, Documentation of degraded support (Required Actions: clean rust, perform weld repairs, replace corroded bolts, coat steel support. Performed Actions: cleaned, bolts replaced, coated – WO38075928001).	Revision 0 05/20/2008

Document	Title	Revision / Date
CR002953	U2, VT-3 examination of support 2-RC-H-001 indicated general corrosion/degradation. Condition documented as rejected by NDE. Engineering noted support considered acceptable as is, recommended cleaning and recoating in next available outage.	Revision 0 10/21/2006
CR003053	U2, VT-3 examination of support 2-CC-H-001. All thread rod positioned around the pipe and protruding below the support had no washers or nuts. An un-numbered drawing had no record of the U-bolt.	Revision 0 10/23/2006
CR025102	U1, VT-3 examination on Hanger 19, located on Blow Down Line 3"-WGCB-1-601 has been rejected due to misalignments. Rod section of the hanger bowed.	Revision 0 11/16/2007
CR098628	U2, ASME Required VT-3 Follow-up examination for next U2 RFO. Activity recorded as Repair/Replacement. Applicable ASME Code, Section XI, Article IWF-2220(b).	Revision 0 05/10/2008
CR1096204	U1, Rejectable relevant conditions identified during ASME Section XI VT-3 examination of a pipe support – 3 loose fasteners and one instance of improper thread engagement (pipe support 1-SI-H016).	Revision 0 05/01/2018
CR1096216	U1, Rejectable condition identified during an ASME Section XI VT-3 examination of pipe support 1-SI-H302A/B – loose anchor bolt, identified in the ISI program as two components.	Revision 0 05/01/2018
CR547012	U2, Missing weld discovered during a scheduled augmented VT-3 examinations of 2-RC-H002, weld shown on drawing 11548-PSSK-124A2.2 and Detail 4 of 11548-FP-9C missing from the support.	Revision 0 04/24/2014
CR356625	U2, Second Preservice VT-3 Exam required for Support 2-RC-H032. Relevant ASME Section XI is IWF-2220(b). Repair/replacement activity on supports in systems that operate at temperatures greater than 200 degrees F, second preservice VT-3 exam following heatup and cooldown. Support welded repair per WO38102664408 in 2RFO22.	Revision 0 11/05/2009
CR531281	U2, Bolt heads on inner bolts not tight to side of clamp on support 2-WS-H002B. Inner bolt on both sides of the pipe clamp were found not tight against the side of the clamp. Support non-functional until condition corrected in accordance with IWF-3122.2 or accepted evaluation per IWF-3122.3.	Revision 0 05/01/2014
CR524106	U1, General corrosion/exfoliation found on ASME Class 3 pipe support 1-WS-H034 identified during ASME Code Section XI VT-3 examination. Applicable ASME XI Section is IWF-3112 acceptance by evaluation.	Revision 0 08/26/2013

SLRA AMP B2.1.32, 10 CFR Part 50, Appendix J

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "ILRT," "LLRT," "Type A," "Type B," "Type C," "Hatch," "Leak Rate," "Leakage," and "Pressure Boundary."

The table below lists the documents that were reviewed by the staff and were found relevant to the 10 CFR Part 50, Appendix J Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR025030	Unit 1, Failure to notify planning to initiate ASME Sect XI repair/replacement follower (Valve was installed using, bolts, nuts washer without the required ASME Section XI repair/replacement follower if any pressure boundary bolting is replaced).	Revision 0 11/15/2007
CR024842	Industry Wide OE, Conval valves weld qualification for welds performed on pressure boundary and safety related components of Conval valves.	Revision 0 11/14/2007
CR104193	U2, Filter body pressure boundary leaks at approximately 30 drops per minute.	Revision 0 07/22/2008
CR440370	RCS Leakage (training related, clarification of definition, valves).	Revision 0 08/30/2011
CR470119	Industry OE, North Anna - Axial flaws exposed during machining and undetected during UT examinations resulted in leakage from the reactor coolant pressure boundary (North Anna).	Revision 0 04/22/2012
CR569478	U2 Type A Test (preparation, alignment, restoration programmatic request).	Revision 0 01/14/2015
CR011384	U2, Improper material selection for bolted joint that passed Type A and Type C testing.	Revision 0 04/30/2007
CR1019301	U2, During Type A pre-test of Unit 2 walkdown observed 3 drops per minute water leakage coming out of 2-FW-33 "B" S/G.	Revision 0 11/23/2015
CR540683	U1 and U2, Discrepancies in 15-YR Type A Test Interval LAR and info provided in subsequent RAI response.	Revision 0 02/25/2014

Document	Title	Revision / Date
CR540988	Type A/B/C Database as-found/as-left leakage results not independently reviewed, resulting in errors being carried over to docketed info. Type B/C allowable leakage limits have been exceeded.	Revision 0 02/27/2014
CR547533	U2, Electrical Penetration 18B failed type B test with leakage coming from adjustment nut on cable vault side of penetration.	Revision 0 05/03/2014
CR004136	U2, Pin-hole leak identified on OSRS piping during Type C testing of PEN 71. (Updated 11/12/06 Operable with evaluation).	Revision 0 11/08/2006
CR003267	Unit 2 RS CLR 1C Inlet CHK Valve failed type C testing with 5.0scfh > 4.5 SNSOC.	Revision 0 11/01/2006
CR002736	Unit 2, Containment Penetration 93 failed Type C Test (diaphragm is leaking).	Revision 0 10/18/2006
CR1060545	2016 – Q4 Appendix J Scorecard Attribute Yellow – Overall color of program personnel – white, Overall color of Surry Appendix J scorecard green.	Revision 0 02/21/2017
CR474991	U1, 1-ss-tv-100a failed as found Type C test with 1.6 scfh leakage verified through valve	Revision 0 05/10/2012
CR476244	U1, 1-DG-TV-108B failed Type C test, verified leakage through valve. leakage 1.8scfh > 0.5-1.0scfh evaluation range.	Revision 0 05/22/2012
CR476845	U1, Pen 50 (1-SI-TV-101A/101B), attempted as-left test, leakage on each valve 1.1scfh > 0.5-1.0 scfh evaluation range.	Revision 0 05/28/2012
CR331621	U1, 1-SS-TV-106A failed as found Type C test, verified through valve, leakage 1.39 scfh > 0.5 scfh.	Revision 0 04/21/2009
CR579317	U1, Pen 48, As Found test IAW 1-OPT-CT-201 unsatisfactory, leakage 1.2 scfh > 0.5-1.0 evaluation range.	Revision 0 05/11/2015
CR580191	U1, 4-bolt flange between 1-SA-62 and U1 containment wall (penetration 42) leaking; LRT 13.6 scfh < 0.5 scfh acceptance criteria.	Revision 0 05/20/2015
CR334236	U1, Containment personnel hatch inner door will not operate. Attempted to enter 1-PT-11 walkdown and VT-2 inspections.	Revision 0 05/10/2009

Document	Title	Revision / Date
CR1053384	U1, Containment personnel hatch inner door pin not actuating, preventing door from opening.	Revision 0 11/09/2016
CR482784	Undesignated Unit, Rust on equipment hatch is breaking through the paint coating, decontamination times ranges from 1.5 to 3 hrs.	Revision 0 07/25/2012
CR1052941	Performed as left Type C test IAW 1-OPT-CT-201 UNSAT on Pen 33.	Revision 0 11/05/2016

SLRA AMP B2.1.33, Masonry Walls

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "masonry," "block," "block wall," "crack," "CMU," "mortar," "grout," and "gap."

The table below lists the documents that were reviewed by the staff and were found relevant to the Masonry Walls Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR480058	Repair observed 0.050 inch crack in masonry block	06/27/2012
CR481883	Repair masonry wall cracks in the Condensate Polishing Building area	07/17/2012
CR335212	Wall damage noted in normal switchgear room	05/18/2009
CR523304	1B battery room FP wall barrier degraded	08/15/2013
CR390852	Crack noted in the Administration Building records	08/10/2010
CR403113	Crack discovered in the Unit 1 Turbine Building mezzanine south block wall	11/09/2008
CR318418	Repair cracks in the north wall of the Fire Pump House	12/30/2008

SLRA AMP B2.1.34, Structures Monitoring

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "crack," "concrete," "leach," "corros," "rebar," "rust," "support," "scc," "steel," "aluminum," "degraded," "leak," "intrusion," and "liner."

The table below lists the documents that were reviewed by the staff and were found relevant to the Structures Monitoring Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR023017	Unit 1 Containment Basemat Floor Cracks	10/22/2017
CR482151	High Level Intake Structure U1 and U2 Concrete Deterioration	07/18/2012
CR486167	Concrete Spall and Cracks in the Unit 2 Turbine Building Basement Floor	07/18/2012
CR570016	Exposed Rebar (Found in Auxiliary Building)	01/20/2015
CR092381	Auxiliary Building Groundwater In-leakage	03/05/2008
CR485014	High Influence to Auxiliary Building Piping Tunnel	08/15/2012
CR010655	1A Underground Fuel Oil House Rain Water Ingress	04/15/2007
CR023548	Leakage Through Concrete Wall	10/28/2007
CR434317	Residue on Wall of 2-CN-TK-1	07/14/2011
CR1053286	1-VS-S-1B Concrete Pedestal Degradation	11/09/2016
CR1018296	Engineering Inspection of Bottom Side of ESPH (efflorescence)	11/13/2015
CR392547	Aging Management Inspection Do Not meet License Renewal Expectation	08/26/2010
CR099599	Documentation of Degraded Support	05/20/2008
CR462599	Results if Performance of O-NSP-FC-001, SFP Leakage Evaluation	02/13/2012

SLRA AMP B2.1.35, Inspection of Water-Control Structures Associated with Nuclear Power Structures

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "concrete," "steel," "crack," "corros," "bolt," "spall," "leakage," "loss of material," "liner," and "degrad."

The table below lists the documents that were reviewed by the staff and were found relevant to the Inspection of Water-Control Structures Associated with Nuclear Power Plants. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR009735	Intake canal liner damage and accumulation of sand, silt, shell, and debris	03/30/2007
CR452182	Annual intake canal liner visual inspection, minor spalling and cracking identified at or just below the water line	11/10/2011
CR385887	One nut missing on one of two grating hinges above 1-FS-RK-8C	06/25/2010
CR1060254	Annual intake canal liner visual inspection, cracking, settling, and broken panels; spalling at expansion joints; and expansion joint sealant degradation	02/16/2017
CR502147	Annual intake canal liner visual inspection, minor spalling and cracking identified at or just below the waterline	01/10/2013
CR396593	Intake canal liner panel degraded at waterline	09/27/2010
CR534897	Annual intake canal liner visual inspection, minor spalling and cracking identified at or near the expansion joint	12/11/2013
CR428830	Minor repairs in Unit 2 Discharge Canal	05/27/2011
CR1069666	Repair of degraded concrete in the high level intake	05/24/2017
CR1067871	High level intake liner panel crack near 2A intake bay	05/08/2017
CR1067879	High level intake bay 2A concrete degradation	05/08/2017

Document	Title	Revision / Date
CR1089118	Concrete repair in the Unit 2 "C" and "D" high level intake bay	01/31/2018
CR494158	Unit 2 high level intake structure concrete cracks	11/01/2012
CR578732	Damaged concrete found in the "C" high level intake	05/05/2015
CR578527	1C CW intake structure concrete/rebar degradation	05/02/2015
CR1016709	Degrading concrete in the Unit 2B intake bay	11/02/2015
CR425435	CW discharge tunnel joint 2 concrete spall	05/02/2011
CR482151	High level intake structure U1 and U2 concrete deterioration	07/18/2012
CR1067871	High level intake liner panel crack near 2A intake bay	05/08/2017
CR1044049	Degraded support foundations for high level intake structure control panel	08/05/2016
CR002335	Intake canal void areas under concrete liner	10/10/2006
CR502147	Results of 0-STP-70.7, annual intake canal liner visual inspection	01/10/2013
CR534897	Results of 0-STP-70.7, annual intake canal liner visual inspection	12/11/2013
CR567031	Results of 0-STP-70.7, annual intake canal liner visual inspection	12/09/2014
CR1059273	Additional guidance for the inspection of ASR in concrete	02/02/2017

SLRA AMP B.2.1.36, Protective Coating Monitoring and Maintenance

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "blister," "coat," "delamin," "lined," "lining," "peel," and "perforat."

The table below lists the documents that were reviewed by the staff and were found relevant to the Protective Coating Monitoring and Maintenance Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR4208070	Unit 2 containment liner blistered paint.	05/21/2011
CR477437	GSI-191 items found during Unit 1 walkdown with NRC.	06/01/2012
CR356642	Coatings Inspection of Unit 2 containment liner.	11/05/2009
CR370892	Evaluation of polyethylene protective wrapping for GSI-191 concerns.	03/03/2010
CR002777	Loose coatings on B RCP motor.	10/19/2006
CR458977	Coating cracking and peeling.	01/12/2012
CR1068099	U2 Containment Coating Assessment 2R27	05/10/2017
CR1051619	U1 Containment Coating Assessment 1R27	10/25/2016
CR480271	Various Areas of U1 Containment Liner require Coating Repairs	06/28/2012
CR003020	Heavy external corrosion on CC pipe at penetration #4	10/22/2006

SLRA AMP B2.1.37, Electrical Insulation for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "cable," "embrittlement," "cracking," "discoloration," "melting," "swelling," "surface contamination," "insulation," and "adverse localized," and searching by system EP (electrical power).

The table below lists the documents that were reviewed by the staff and were found relevant to the B2.1.37, Electrical Insulation for Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR1016223	Degraded insulation found on cable in MCC (480V). Cable was repaired or replaced.	10/31/2015

Document	Title	Revision / Date
CR021741	Motor Leads and Field Cable for Spent Fuel Pit Pump 1A show signs of degradation. Cable insulation is age-hardened up to the conductor. Replaced cable.	10/05/2007
CR527992	Emergency Turbine Lube Oil Pump positive ground indication. Degraded connection or cable jacket/insulation. Cable replaced.	10/01/2003
CR388637	Aging Management General Condition Monitoring. Evaluate compliance with Technical Report LF-1766/LR-2766. General Condition Monitoring Activities	07/21/2010
CR098889	Generate Work Order to Inspect Unit 2 Containment Air Recirculation Fan Motor Leads. Visual inspection of cable splice/connectors for evidence of overheating (discoloration, swell, crack, etc.)	05/13/2008
CR099209	Generate Work Order to Inspect Unit 2 Containment Air Recirculation Fan Motor Leads. Visual inspection of cable splice/connectors for evidence of overheating (discoloration, swell, crack, etc.)	05/15/2008
CR1076769	Generate programmatic work order for replacement of U1/U2 Containment Air Recirculation Fan power circuit cables. Replace power circuit cables between load center breaker and containment penetration. Evidence of extreme degradation, severe cracking of cable jacket, reduction in insulation resistance, oozing black sticky liquid due to polymer breakdown.	08/29/2017
CR1009639	Neutral conductor found in lighting panel with insulation damage. Neutral was near hinge and caused rubbing.	09/04/2015
CR327669	1-CW-P-1D (circulating water pump 1D) Motor feeder cable degrading. Polarization index results are consistent with insulation starting to degrade. Replace cable.	03/19/2009
CR1035707	License Renewal non-EQ Cable W/D item – Cable exposed through flexible conduit	04/27/2016
CR1035716	License Renewal non-EQ Cable W/D item – Cables covered with paper and red tape	04/27/2016

Document	Title	Revision / Date
CR1035737	License Renewal non-EQ Cable W/D item – Cable investigation/evaluation requested. Outer cable jacket anomalies. Did walkdown for environmental conditions and tested cables.	04/27/2016

SLRA AMP B.2.1.38, Electrical Insulation for Electrical Cables and Connections Not Subject to 10.CFR 50.49 Environment Qualification Requirements used in Instrumentation Circuits.

Audit Activities. The staff conducted an independent search of dominion’s operating experience database using keywords: “nuclear instrumentation,” “blistering,” “electrical cables,” “radiation monitoring,” “high voltage circuit,” “radiation monitor,” “calibration check,” “instrumentation,” and “calibration.”

The table below lists the documents that were reviewed by the staff and were found relevant to the Electrical Insulation for Electrical Cables and Connections Not Subject to 10.CFR 50.49 Environment Qualification Requirements used in Instrumentation Circuits Program. These documents were identified in the staff’s search of Dominion’s operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR024076	While performing calibrations on N-44 Power Range drawer for refueling it was discovered that insulation worn off of two wires of cable P-312. Noticed supervision and engineering; engineering created a work order to repair. No function or indication of the drawer were affected.	11/2/2007
CR386686	Surry, Unit 2 intermediate range channel N36 Control Power Fuse opening after the installation of the new RC filter, the N36 drawer was removed from the NIS cabinet for troubleshooting. An inspection of the cabling reveled the high voltage and signal cable outer jackets where frayed approximately 12 inched from the triax connector. WO created to repair the outer jacket.	07/02/2010
CR578511	Nuclear Instrumentation cables missing insulation. While removing ground wires IAW work order 38103480618 in unit 1 Nuclear Instrumentation Cabinet #1 the existing cables 1VB170 and 1 VB171 were found to have a section of insulation removed.	05/02/2015
CR376587	As part of License Renewal application the station has a commitment concerning NI cables (UFSAR table 18-1 item	01/17/2010

Document	Title	Revision / Date
	19). The station commitment for aging management of NI cables is to monitor the cables IAW the channel calibration procedures	
CR007930	4 cables in the Unit 2 Doghouse behind the north west door labels "Turbine Instruments Inside" have cracked insulation and exposed bare wires. The SRO was notified and a work order issued requesting repair.	02/23/2007
CR538148	The insulation surrounding the electric wiring to 1-MA-RM-190 (Unit #1 A N-16) is degrading. The degradation appears to be caused by vibration and is located where the cables exit the detector and enter the conduit.	06/16/2015

SLRA AMP B2.1.39, Electrical Insulation for Inaccessible Medium-Voltage Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "cable," "manhole," "submerge," "insulation," "sump pump," "tan delta," "degraded cable," and "vault."

The table below lists the documents that were reviewed by the staff and were found relevant to the Electrical Insulation for Inaccessible Medium-Voltage Power Cable Not Subject to 10 CFR 50.49 EQ Requirements Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR021436	When the cover for MH 0-SE-MH-21 was removed to locate a conduit, water was found in the manhole. The water level was within 12" of the top of the manhole. CR is being submitted to identify this condition.	10/02/2007
CR102577	This CR is submitted to initiate a program work order to NSS to implement Design Change Package (DCP) 08-019 upon an issue. This DCP will direct the installation of a sump pump into manholes 1-EP-MH-1 and 1-EP-MH-2 to keep manholes in a dewatered state. This will eliminate the potential for future cable submergence. This DCP was scheduled to be issued 10/30/2008.	06/30/2008
CR438662	While performing security and electrical manhole inspection Work Order 38102819108, electrical cables were found submerged in 0-SE-MH-6, 9, 10, 11, 12, and 13.	08/19/2011
CR523506	CR241526 and Work Order 38103367178 require investigation into the EDG#1 Diesel Isolation Panel cable conductor failures that were replaced in February 2013.	08/14/2013
CR474809	While performing the installation testing of the new Unit 1 Station Service Transformer (SST) 1B secondary feeder cable in accordance with Design Change 11-00004, one of the nine cables failed the specified Tan Delta testing requirements. The designation of the one failed cable is 1B2PH31. The remaining eight cables passed satisfactorily.	05/11/2012

SLRA AMP B2.1.40, Electrical Insulation for Inaccessible Instrument and Control Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "cable," "manhole," "submerge," "insulation," "sump pump," "degraded cable," and "vault."

The table below lists the documents that were reviewed by the staff and were found relevant to the Electrical Insulation for Inaccessible Instrument and Control Cables Not Subject to 10 CFR 50.49 EQ Requirements Program. These documents were provided by Dominion or were identified in the staff's search of Dominion operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed		
Document	Title	Revision / Date
CR021611	On 10/04/2007, when cover from manhole 0-SE-MH-21 was removed to gain access to remove cable from a conduit, water was found in the manhole. The water was approximately 48" deep. CR 21436 was previously submitted to identify that the manhole to be de-watered on 09/06/2007.	10/04/2007
CR102577	This CR is submitted to initiate a program work order to NSS to implement Design Change Package (DCP) 08-019 upon an issue. This DCP will direct the installation of a sump pump into manholes 1-EP-MH-1 and 1-EP-MH-2 to keep manholes in a dewatered state. This will eliminate the potential for future cable submergence. This DCP was scheduled to be issued 10/30/2008.	06/30/2008
CR438662	While performing security and electrical manhole inspection Work Order 38102819108, electrical cables were found submerged in 0-SE-MH-6, 9, 10, 11, 12, and 13.	08/19/2011
CR421104	During a review of license renewal commitment and activities, it has been determined that the manhole that includes the medium voltage cable (34.5 kV) that supplies 01-EP-RST-C is not periodically inspected for water collection.	04/06/2011

SLRA AMP B2.1.41, Electrical Insulation for Inaccessible Low-Voltage Power Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "cable," "manhole," "submerge," "insulation," "sump pump," "tan delta," "degraded cable," and "vault."

The table below lists the documents that were reviewed by the staff and were found relevant to the Electrical Insulation for Inaccessible Low-Voltage Power Cables Not Subject to 10 CFR 50.49 EQ Requirements Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR021611	On 10/04/2007, when cover from manhole 0-SE-MH-21 was removed to gain access to remove cable from a conduit, water was found in the manhole. The water was approximately 48" deep. CR 21436 was previously submitted to identify that the manhole to be de-watered on 09/06/2007.	10/04/2007
CR102577	This CR is submitted to initiate a program work order to NSS to implement Design Change Package (DCP) 08-019 upon an issue. This DCP will direct the installation of a sump pump into manholes 1-EP-MH-1 and 1-EP-MH-2 to keep manholes in a dewatered state. This will eliminate the potential for future cable submergence. This DCP was scheduled to be issued 10/30/2008.	06/30/2008
CR438662	While performing security and electrical manhole inspection Work Order 38102819108, electrical cables were found submerged in manholes 0-SE-MH-6, 9, 10, 11, 12, and 13.	08/19/2011
CR421104	During a review of license renewal commitment and activities, it has been determined that the manhole that includes the medium voltage cable (34.5 kV) that supplies 01-EP-RST-C is not periodically inspected for water collection.	04/06/2011

SLRA AMP B2.1.42, Metal Enclosed Bus

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "metal enclosed bus," "gasket," "MEB," "bus," "bus pitting," "bus corrosion," and "connection."

The table below lists the documents that were reviewed by the staff and were found relevant to the Metal Enclosed Bus Program. These documents were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR421824	Transfer Bus E maintenance – Perform inspection of bus bolted connections inside switchgear cubicle 15E1.	04/11/2011
CR002212	C Reserve Station Service Transformer/1F Transfer Bus Bar Damage. Cleaned and buffed bus bar.	10/08/2016

SLRA AMP B2.1.43, Electrical Cable Connections Not Subject to 10 CFR50.49 Environmental Qualification Requirements

Audit Activities. The staff conducted an independent search of Dominion’s operating experience database using keywords: “thermal cycling,” “thermography,” “ohmic heating,” “chemical contamination,” “corrosion,” “vibration,” “cable connection,” “increased resistance,” “loose connection,” “oxidation,” and “discoloration.”

The table below lists the documents that were reviewed by the staff and were found relevant to the Electrical Cable Connections Not Subject to the 10 CFR 50.49 Environmental Qualification Requirements Program. These documents were identified in the staff’s search of Dominion’s operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR354894	EDG # 2 Cable connection torque values were 73 in-lb in contrast with the battery charger procedure (0-ECM-0104-03) that calls for 54 in-lb. CR 358757 was initiated to replace bolting hardware.	10/26/2009
CR451209	During walkdown it was noticed that only a thin layer of No-Ox grease has been applied. Procedure 0-ECM-0104-03 will be updated to clarify.	11/03/2011
CR494789	Cable connection for the potential transformer for EP-BKR-25A2 is degraded. Wires also showed signs of corrosion. Initiated work order to repair.	11/04/2012
CR497701	Inspect cable connections for NI power range 02-NI-42A-DETECT. Closed to work order.	11/29/2012
CR106586	Found loose connection during 10 year PM on fuses F301, 302, 303 in 1A1-UPS-BC. Procedure: 0-ECM-0103-02. Work Order: 38075774601	08/20/2008

Document	Title	Revision / Date
CR333964	During performance of protective relay maintenance, loose connections were found at the fuse pull box. Work Order 381021888261 generated for repairs.	05/07/3013
CR531986	While performing motor PM, signs of connection overheating were noticed. Repairs were completed per WO 38103241127.	11/08/2013

SLRA AMP B2.1.44, High-Voltage Insulators

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "thermal cycling," "thermography," "ohmic heating," "chemical contamination," "corrosion," "vibration," "cable connection," "increased resistance," "loose connection," "oxidation," and "discoloration."

The table below lists the documents that were reviewed by the staff and were found relevant to the High-Voltage Insulators Program. These documents were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR114400	Thermography camera was found to be inaccurate by 7 degrees F. Purchased new camera and this camera will no longer be used for absolute temperature measurements.	10/16/2008
CR412063	High-voltage bushing failure caused transformer fire at Indian Point. Corrective actions assigned to Control Ops to review and determine any immediate actions.	01/31/2011
CR111589	Thermography predictive analysis activities was not performed as recommended.	09/29/2008
CR531295	Arcing was discovered on B phase of unit 2 generator 500 kV line at the vertical insulators while raining. This was determined to be due to contamination build up during dry season which gets washed away by rain.	11/02/2013

SLRA AMP B3.1, Fatigue Monitoring

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "fatigue," "cycl," "transient," "design cycle," "fatigue cracking," "CUF," and "usage factor." No significant plant-specific operating experience associated with the Fatigue Monitoring Program was noted by the staff during its review.

SLRA AMP B3.2, Neutron Fluence Monitoring

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using these keywords: "flux," "fluence," "dosi," "rpv," "rv," and "vessel." The staff also reviewed condition reports and associated corrective action reports (if any) referenced in the audit portal for SLRA AMP B3.2, "Neutron Fluence Monitoring."

The staff did not identify any operating experience associated with SLRA AMP B3.2 based on the keyword search performed by the staff.

SLRA AMP B3.3, Environmental Qualification of Electric Equipment

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "EQ," "environmental qualification equipment," "environmental qualification component," and "environmental qualification – aged related degradation."

The table below lists the documents that were reviewed by the staff and were found relevant to the Environmental Qualification of Electric Equipment Program. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR113666	During the EQ self-assessment the following were identified. License Renewal Technical Report LR-1011/LR-2011, issued on 03/30/2001, evaluated all North Anna and Surry EQ program Qualified Document Review (QDR) packages for impact of license renewal to a total of 60 (40 + 20) years. To date approximately 50 QDR packages still require updating as a result of the License Renewal Project. A tracking mechanism was not identified to be in place to ensure the timely completion of the remaining QDRs. This is not an operability issue because neither Surry or North Anna have exceeded the 40 year life cycle and EQ equipment affect by the unrevised QDRs is currently qualified and managed to a 40 year life cycle. A tracking mechanism is required to avoid potential NRC findings in the first to 60 (40 + 20) years extension (Surry Unit 1 year 2012).	07/10/2010
CR386970	Ambient temperature taken over a two-day period in the upper level of Units 1 and 2 main steam valve house (MSVH) were evaluated due to the high outside temperatures. A review was performed by program engineering to identify if there were any EQ related equipment in these areas and to determine if the elevated temperatures were enveloped by the current qualification documentation.	07/01/2010
CR375131	It has been identified by Outage and Planning that two NAMCO limit switches were not replaced during the last Unit 1 outage. These switches should have been replaced for EQ reason before 06/08/2010 which means that the last opportunity to replace them, before their qualified life expired, was the 2009 Unit 1 Spring outage. These do not affect the switches ability to perform their design function. However, after June 8, 2010, they will not be EQ qualified without evaluation. The qualified life for the switches has been evaluated and it has been determined that it can be extended until the next 2010 Unit 1 outage. CA to Outage and Planning was to replace the switches during the next Unit 1 outage after the issuance of ET-S-10-0039. CA to engineering to track the completion of the ET-S-10-0039.	04/05/2010

AMR Item OE Input Not Associated with an AMP: Stainless Steel, Aluminum Alloy, and Nickel Alloy Loss of Material and Stress Corrosion Cracking

Audit Activities: The staff conducted an independent search of Dominion's operating experience database using keywords: "crack," "scc," and "stress corrosion cracking." The table below lists the documents that were reviewed by the staff and were found relevant to the TRP Title. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR099000	Through wall stress corrosion cracking (SCC) was identified on the outlet nozzle of 2-RH-E-1A. [residual heat removal]	05/14/2008
CR402568	Rejectable linear indications were found on a safety injection weld.	11/05/2010
CR480972	The 10-inch stainless steel condensate supply line from 2-CN-TK2-2 to the unit 2 hotwell makeup valves has a 3 – 4-inch circumferential crack.	07/06/2012
CR523923	There is a concentration of chlorides on service water tubing which led to SCC.	08/22/2013
CR527365	External staining was observed on a failed service water tubing.	09/26/2013
CR535232	SCC was observed on service water flexible tubing.	12/16/2013

AMR Item OE Input Not Associated with an AMP: Transmission Conductors, Switchyard Bus, and Connections

The following four AMR items are discussed in SLRA 3.6.2.2.3 further evaluation section:

- SLRA Table 3.6.2 item corresponding to SLRA Table 3.6.1-004, "transmission conductors" composed of aluminum, and steel exposed to air-outdoor
- SLRA Table 3.6.2 item corresponding to SLRA Table 3.6.1-005, "transmission connectors" composed of aluminum, and steel exposed to air-outdoor
- SLRA Table 3.6.2 item corresponding to SLRA Table 3.6.1-006, "switchyard bus and connections" composed of aluminum, copper, bronze, stainless steel, and galvanized steel exposed to air-outdoor
- SLRA Table 3.6.2 item corresponding to SLRA Table 3.6.1-007, "transmission conductors" composed of aluminum, and steel exposed to air-outdoor

The staff conducted an independent search of Dominion's operating experience database using keywords: "switchyard buses," "transmission conductor," "loss of strength," "increased resistance," "abrasion," "connection," "thermography," and "corrosion." The table below lists the documents that were reviewed by the staff and were found relevant to the TRP 059, "Transmission Conductors and Switchyard Buses," SLRA further evaluation item 3.6.2.2.3. These documents were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR320285	Thermography indication on G104 disconnect showed a delta T of 35.7 degrees F. Control Ops was notified for action.	01/16/2009
CR3567475	While performing thermography on the 290 line, a hot spot was found on disconnect switch 24004. A and B phase delta T is 20 degrees C. Control Ops cleaned and greased switch and thermography is satisfactory.	11/10/2009
CR356822	During maintenance activities on the "B" RSST, 34.5 kV high side disconnect switch, it was discovered that the contact resistance did not meet the 200 micro-ohm specification. The disconnect switch will be replaced per transmission SAP work order process.	11/06/2009
CR439030	Thermography survey of switchyard bolted connections of the 500 kV and 34.5 kV lines indicated some elevated temperatures. Work order 67379411 was created to track monitoring every three months.	08/23/2011
CR527098	Thermography hot spot observed on two bolted connections on transmission structure #4 associated with unit 1 main transformer leads connected to the switchyard. Additional scans of 230 kV structures indicated no hot spots.	09/24/2013

SLRA TLAA Section 4.1, Identification of Time-Limited Aging Analyses and Regulatory Exemptions

Audit Activities. Section 4.1 of the SLRA for Surry, Unit Nos. 1 and 2, provides the applicant's results of its review of plant analyses, evaluations, calculations, or assessments (AECAs) that may qualify as time-limiting aging analyses (TLAAs) in accordance with the definition for TLAAs in 10 CFR 54.3(a) and need to be identified and evaluated in the SRLA in accordance with the requirements in

10 CFR 54.21(c)(1). SLRA Section 4.1 also includes the results of the applicant's review to identify and evaluate any regulatory exemptions that were granted in the current licensing basis (CLB) under the requirements of 10 CFR 50.12 and are based on a TLAA, as required in accordance with 10 CFR 54.21(c)(2).

Since SLRA Section 4.1 relates to identification of applicable TLAA's and regulatory exemptions in accordance with the requirements of 10 CFR 54.21(c)(1) and (c)(2), there is no operating experience associated with this section of the SLRA. As such, the staff did not perform a search for operating experience that might be related to the contents of SLRA Section 4.1.

SLRA TLAA, Section 4.2.1, Neutron Fluence Projections

Audit Activities The staff conducted an independent search of the applicant's CR database using keywords: "aging," "break," "corrosion," etc.

No significant plant-specific operating experience associated with the Neutron Fluence Projections was noted by the staff during its review.

SLRA TLAA Section 4.2.2, Upper Shelf Energy

Audit Activities. The staff conducted an independent search of the Dominion's operating experience database using these keywords: "upper shelf energy," "USE," "RPV," and "vessel." The staff also reviewed condition reports and associated corrective action reports (if any) referenced in the audit portal for SLRA TLAA 4.2.2, "Upper-Shelf Energy."

The staff did not identify any OpE associated with SLRA TLAA 4.2.2 based on the keyword search performed by the staff.

However, the staff acknowledges that OpE related to the applicant's TLAA on RPV upper shelf energy (USE) is generated through the applicant's implementation of its reactor vessel materials surveillance program (RVMSP, refer to SLRA Section B2.1.19), which is based on the requirements 10 CFR Part 50, Appendix H. The relevant OpE and associated RPV surveillance data are summarized in RPV surveillance reports that are generated in accordance with reporting requirements specified in the §Part 50, Appendix H rule.

SLRA TLAA Section 4.2.3, Pressurized Thermal Shock

Audit Activities. The staff conducted an independent search of the Dominion's operating experience database using these keywords: "pressurized thermal shock," "PTS," "RPV," and "vessel." The staff also reviewed condition reports and associated corrective action reports (if any) referenced in the audit portal for SLRA TLAA 4.2.3, "Pressurized Thermal Shock."

The staff did not identify any OpE associated with SLRA TLAA 4.2.3 based on the keyword search performed by the staff.

However, the staff acknowledges that OpE related to the applicant's TLAA on reactor pressure vessel RPV pressurized thermal shock (PTS) is generated through the applicant's implementation of its reactor vessel materials surveillance program (RVMSP, refer to SLRA Section B2.1.19), which is based on the requirements 10 CFR Part 50, Appendix H.

The relevant OpE and associated RPV surveillance data are summarized in RPV surveillance reports that are generated in accordance with reporting requirements specified in the §Part 50, Appendix H rule.

SLRA TLAA Section 4.2.4, Adjusted Reference Temperature

Audit Activities. The staff conducted an independent search of the Dominion's operating experience database using these keywords: "RT_{NDT}," "adjusted reference temperature," "ART," "RPV," and "vessel." The staff also reviewed condition reports and associated corrective action reports (if any) referenced in the audit portal for SLRA TLAA 4.2.4, "Adjusted Reference Temperature."

The staff did not identify any OpE associated with SLRA TLAA 4.2.4 based on the keyword search performed by the staff.

However, the staff acknowledges that OpE related to the applicant's TLAA on RPV adjusted reference temperature (ART) calculations is generated through the applicant's implementation of its reactor vessel materials surveillance program (RVMSP, refer to SLRA Section B2.1.19), which is based on the requirements 10 CFR Part 50, Appendix H. The relevant OpE and associated RPV surveillance data are summarized in RPV surveillance reports that are generated in accordance with reporting requirements specified in the §Part 50, Appendix H rule.

SLRA TLAA Section 4.2.5, Pressure-Temperature Limits

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using these keywords: "p-t," "pressure-temp," "curve," "ferri," "rpv," "rv," and "vessel." The staff also reviewed condition reports and associated corrective action reports (if any) referenced in the audit portal for SLRA TLAA 4.2.5, "Pressure-Temperature Limits."

The staff did not identify any OpE associated with SLRA TLAA 4.2.5 based on the keyword search performed by the staff.

However, the staff acknowledges that OpE related to the applicant's TLAA on pressure-temperature (p-t) limits is generated through the applicant's implementation of its reactor vessel materials surveillance program (RVMSP, refer to SLRA Section B2.1.19), which is based on the requirements 10 CFR Part 50, Appendix H. The relevant OpE and associated rRPV surveillance data are summarized in RPV surveillance reports that are generated in accordance with the reporting requirements in 10 CFR Part 50, Appendix H.

SLRA TLAA Section 4.2.6, Low Temperature Overpressure Protection

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using these keywords: "ltop," "overpress," "ferri," "rpv," , "rv," and "vessel." The staff also reviewed condition reports and associated corrective action reports (if any) referenced in the audit portal for SLRA TLAA 4.2.6, "Low Temperature Overpressure Protection."

The staff did not identify any OpE associated with SLRA TLAA 4.2.6 based on the keyword search performed by the staff.

However, the staff acknowledges that OpE related to the applicant's TLAA on low temperature overpressure protection (LTOP) is generated through the applicant's implementation of its reactor vessel materials surveillance program (RVMSP, refer to SLRA Section B2.1.19), which is based on the requirements 10 CFR Part 50, Appendix H. The relevant OpE and associated RPV surveillance data are summarized in RPV surveillance reports that are generated in accordance with the reporting requirements in 10 CFR Part 50, Appendix H.

SLRA TLAA Section 4.3.1, Transient Cycle Projections for 80 Years

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "fatigue," "cycl," "transient," "design cycle," "fatigue cracking," "CUF," and "usage factor." No significant plant-specific operating experience associated with the TLAA Section 4.3.1, "Transient Cycle Projections for 80 Years," was noted by the staff during its review.

SLRA TLAA Section 4.3.2, ASME Code, Section III, Class 1 Fatigue Analyses

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "fatigue," "cycl," "transient," "design cycle," "fatigue cracking," "CUF," and "usage factor." No significant plant-specific operating experience associated with the TLAA Section 4.3.2, "ASME Code, Section III, Class 1 Fatigue Analyses," was noted by the staff during its review.

SLRA TLAA Section 4.3.3, ANSI B31.1 Allowable Stress Analyses

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "cycle," "thermal cycle," "cyclic," "fatigue crack," "cumulative," and "CUF." No significant plant-specific operating experience associated with the TLAA Section 4.3.3, "ANSI B31.1 Allowable Stress Analyses," was noted by the staff during its review.

SLRA TLAA Section 4.3.4, Environmentally-Assisted Fatigue

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "environmental," "EAF," "fatigue cracking," and "CUF." No significant plant-specific operating experience associated with the TLAA Section 4.3.4, "Environmentally-Assisted Fatigue," was noted by the staff during its review.

SLRA TLAA Section 4.3.5, Reactor Vessel Internals Fatigue Analyses

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "fatigue," "cycl," "transient," "design cycle," "fatigue cracking," "CUF," and "usage factor." No significant plant-specific operating experience associated with the TLAA Section 4.3.5, "Reactor Vessel Internals Fatigue Analyses," was noted by the staff during its review.

SLRA TLAA Section 4.6, Containment Liner Plate, Metal Containments, and Penetrations Fatigue Analysis

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "bellows," "containment," "crack," "damage," "fatigue," "leak," "liner," "penetration," and "weld."

No significant plant-specific operating experience associated with the SLRA Section 4.6, Containment Liner Plate, Metal Containments, and Penetrations Fatigue Analysis, was noted by the staff during its review.

SLRA TLAA 4.7.1, Crane Load Cycle Limits

Audit Activities. The staff conducted an independent search of the applicant's operating experience database using keywords: "crane," "bridge," "block," "column," "girder," "roller," "fatigue of crane," "structural support," and "trolley."

The table below lists the documents that were reviewed by the staff and were found relevant to the Crane Load Cycle Limits. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed		
Document	Title	Revision / Date
CR0005071	U2 manipulator crane mast barely rotates in clockwise direction	11/30/2006
CR0022590	U1 turbine crane malfunction bridge brake lock up	10/16/2007
CR0331474	Polar crane hook tram measurements don't match the procedure	04/20/2009
CR0387958	Polar crane festoon cables are degrade	07/15/2010
CR0508372	Overhaule polar crane drive wheels	03/18/2013
CR0498759	Polar crane drive wheel needs replacing on U2	12/01/2012
CR0527990	Structural bolt found missing during crane PM	10/20/2013
CR0546964	U2 Polar crane malfunction while lowering the RX hood	04/29/2014
CR0565746	IN 14-12 Crane & Heavy Lft Issue Identified During NRC Inspections	11/19/2014

SLRA TLAA Section 4.7.2, Reactor Coolant Pump Flywheel Fatigue Crack Growth Analyses

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "fatigue," "cycl," "transient," "design cycle," "fatigue cracking," "CUF," "flywheel," and "usage factor." No significant plant-specific operating experience associated with the 4.7.2, "Reactor Coolant Pump Flywheel Fatigue Crack Growth Analyses," was noted by the staff during its review.

SLRA AMP TLAA Section 4.7.3, Leak-Before-Break

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "leak before break," "LBB," "leak," "crack," "cast," "rupture," "SCC," and "leak rate."

The table below lists the documents that were reviewed by the staff and were found relevant to TLAA Section 4.7.3., Leak-Before-Break. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
NSAL-11-2	Impact of Change in Lower Radial Key Stiffness Value	06/28/2011
CR432997	Impact of Change in Lower Radial Key Stiffness Value – NSAL-11-2	07/01/2011
CR492143	Additional Systems, Structures and Components Affected by the Issue Addressed by Operability Determination (OD) 000427	10/17/2012
OD000427	Operability Determination Regarding the Impact of Change in Lower Radial Key Stiffness Value	Revision 3
Closure Request for OD000427	Closure Request for the Non-Conforming Condition that Resulted in OD000427	02/19/2015
CA269158	Corrective Action Assignments to Update the Analyses in Response to OD000427	09/17/2013

SLRA Section 4.7.4, Spent Fuel Pool Liner Fatigue Analysis

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "crack," "fatigue," "leak," "liner," "fuel pool," and "weld."

The table below lists the documents that were reviewed by the staff and were found relevant to the SLRA Section 4.7.4, Spent Fuel Pool Liner Fatigue Analysis. These documents were provided by Dominion or were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR479595	Request to generate work order for NDE of the Fuel Building Sump Liner Welds	06/21/2012
CR483122	On-going Spent Fuel Pool Liner Evaluation	07/27/2012
WO38103198062	92 Day Frequ. PT: Spent Fuel Pool Leakage Evaluation	07/09/2012
WO38103256142	Request to generate work order for NDE of the Fuel Building Sump Liner Welds	07/30/2012

SLRA TLAA Section 4.7.6, Reactor Coolant Pump Code Case N-481

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using keywords: "stress corrosion cracking," "fatigue," "embrittlement," and "pump casing." No significant plant specific operating experience associated with the Program Title or TLAA Section 4.7.6, "Reactor Coolant Pump Code Case N-481 " was noted by the staff during its review.

SLRA TLAA Section 4.7.7, Cracking Associated with Weld Deposited Cladding

Audit Activities. The staff conducted an independent search of the Dominion's operating experience database using these keywords: "separations," "cladding," "under-clad," "RPV," and "vessel." The staff also reviewed condition reports and associated corrective action reports (if any) referenced in the audit portal for SLRA TLAA 4.7.7, "Cracking Associated with Weld Deposited Cladding."

The staff did not identify any significant OpE associated with SLRA TLAA 4.7.7 based on the keyword search performed by the staff.

However, the staff acknowledges that OpE related to this TLAA (TLAA on under-clad cracking) is summarized in TLAA References 4.8-89, 4.8-90, and 4.8-91 of the SLRA.

SLRA TLAA Section 147.08, Steam Generator Tube High Cycle Fatigue Evaluation

Audit Activities. The staff conducted an independent search of Dominion's operating experience database using the keyword "steam generator tube."

The table below lists the documents that were reviewed by the staff and were found relevant to the External Surfaces Monitoring of Mechanical Components Program. These documents were identified in the staff's search of Dominion's operating experience database. The staff will document its review of relevant operating experience in the SER.

Relevant Documents Reviewed

Document	Title	Revision / Date
CA3030765	WCAP-18379-P – Surry Units 1 and 2 SG U-Bend Tube Vibration and Fatigue Assessment	05/14/2016
CR1028773 CR489933 CR498535	Nuclear Safety Advisory Letter 12-7 Insufficient Insertion of Anti-Vibration Bars	09/24/2012

SLRA TLAA Section 147.09, Steam Generator Tube Wear Evaluation

Audit Activities. The staff conducted an independent search of Dominion’s operating experience database using the keywords “steam generator tube wear.”

No significant plant-specific operating experience associated with steam generator tube wear was noted by the staff during its review.

SLRA Scoping and Screening, Section 2.3.1.1, Reactor Vessel and Section 2.3.1.3, Reactor Coolant

Audit Activities The staff conducted an independent search of the applicant’s CR database using keywords: “aging,” “break,” “corrosion,” etc.

The table below lists the documents that were reviewed by the staff and were found relevant to the Scoping and Screening.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR003285	Steam generator tube exhibits corrosion stain at tube end	10/16/2006
CR003441	Erosion was noted on the areas near the SG A hot leg manway	03/26/2009
CR097662	Rust identified on new RCP main flange fasteners	05/03/2008
CR1018125	Circ. Cracks identified in 2-RC-E-1C tubes	11/12/2015
CR424807	S/G riser barrel in “A” SG has a hole from J-nozzle erosion	04/28/2011

CR501750	Work request to support AREVA inspection of reactor	01/07/2013
CR501754	Work request to support AREVA inspection of reactor	01/07/2013
CR547625	Area of deformation and areas of foreign material on Unit 2 lower core plate	05/04/2014
CR579206	Corrosion identified on motor stand for 01-RC-P-1C	05/09/2015

SLRA Scoping and Screening, Section 2.3.1.4, Steam Generator

Audit Activities The staff conducted an independent search of the applicant's CR database using keywords: "aging," "break," "corrosion," etc.

The table below lists the documents that were reviewed by the staff and were found relevant to the Scoping and Screening.

Relevant Documents Reviewed		
Document	Title	Revision / Date
CR456076	License Renewal create WO to inspect piping adjacent to 01-RT-S-1A-FILTER	12/13/2011

SLRA Scoping and Screening, Section 2.3.2.1, Containment Spray

Audit Activities The staff conducted an independent search of the applicant's CR database using keywords: "aging," "break," "corrosion," etc.

The table below lists the documents that were reviewed by the staff and were found relevant to the Scoping and Screening.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR418049	2-CS-4 body to bonnet fasteners have corrosion (rust)	03/17/2011
CR418052	2-CS-25 body to bonnet fasteners have corrosion (rust)	03/17/2011
CR425489	Flange face of 2-CS-132 at 2-CS-LT-200C has radial pitting in gasket seat area	05/02/2011
CR485907	2-CS-MR-18 Refrigeration unit degraded concrete foundation	08/23/2012
CR534531	As found condition, unsat body to bonnet bolting on 02-CS-30	12/06/2013
CR567078	Performed as found License Renewal VT-3 inspection on 1-CS-30	12/09/2014

SLRA Scoping and Screening, Section 2.3.2.2, Recirculation Spray

Audit Activities The staff conducted an independent search of the applicant's CR database using keywords: "aging," "break," "corrosion," etc.

The table below lists the documents that were reviewed by the staff and were found relevant to the Scoping and Screening.

Relevant Documents Reviewed

Document	Title	Revision / Date
CR402181	Degradation found on piping flanges	11/3/2010
CR444870	License Renewal Create WO to inspect 38-02-RS-FE-257B-DETECT	09/27/2011
CR444876	License Renewal Create WO to perform inspection of 38-01-RS-RO-110B-PIPE	09/27/2011
CR451696	License Renewal Create WO to visually inspect of 38-01-RS-ICV-3600-VALVE	11/07/2011

CR454598	License Renewal Create WO to inspect of 38-01-RS-PP-0.75-RS-PIPE-47-ICN9	12/01/2011
CR500599	License Renewal Create WO to externally inspect 38-02-RS-E-2A-2-RS-PT-255A	12/20/2012
CR425084	Surface corrosion on flange downstream of 2-RS-RO-212B-PIPE	04/29/2011
CR002809	Support bracket for 2-RH-MOV-2700 has indications of material loss	10/19/2006

SLRA Scoping and Screening, Section 2.3.2.3, Residual Heat Removal

Audit Activities The staff conducted an independent search of the applicant's CR database using keywords: "aging," "break," "corrosion," etc.

The table below lists the documents that were reviewed by the staff and were found relevant to the Scoping and Screening.

Relevant Documents Reviewed		
Document	Title	Revision / Date
CR002809	Support bracket for 2-RH-MOV-2700 has indications of material loss	10/19/2006
CR099000	NOD questions regarding stress corrosion cracking on RHR components	05/14/2008
CR475847	Crack and voids of grout noted on 1-RH-E-1A Supports	05/19/2012

SLRA Scoping and Screening, Section 2.3.2.4, Safety Injection

Audit Activities The staff conducted an independent search of the applicant's CR database using keywords: "aging," "break," "corrosion," etc.

The table below lists the documents that were reviewed by the staff and were found relevant to the Scoping and Screening.

Relevant Documents Reviewed

Document	Description	Revision / Date
CR003298	SI check valve body seat lower portion eroded on 2-SI-82 check valve	10/22/2006

3. Applicant Personnel Contacted During Audit

Participants	Affiliation
Paul Aitken	Dominion Energy
Eric Blocher	Dominion Energy
Pratt Cherry	Dominion Energy
John Disosway	Dominion Energy
Craig Heah	Dominion Energy
James Johnson	Dominion Energy
Dan Madden	Dominion Energy
Keith Miller	Dominion Energy
John Voss	Dominion Energy

4. Exit Meeting

An exit meeting was held with the applicant on December 19, 2018, to discuss the results of the operating experience audit. The staff may issue requests for additional information to support completion of the staff's SLRA review.