

V. C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1 SUBSEQUENT LICENSE RENEWAL APPLICATION

ACRS Committee Meeting
March 6, 2025



Agenda

- Introductions
- V.C. Summer Site Overview
- Subsequent License Renewal Application
- Technical Topics
- Closing Remarks

Introductions

Beth Jenkins, VCSNS Site Vice President

James Holloway, Vice President Nuclear Engineering & Fleet Support

Brenda Brown, Director – Nuclear Engineering – VCSNS

Calvin Pugh, SLR Director

Richard Burtt, Manager – Nuclear Site Engineering – VCSNS

Keith Miller, SLR Supervisor

Chuck Tomes, SLR Technical Lead

Pratt Cherry, SLR Mechanical Lead

Site Layout



Legend

- Protected Area Fence
- +++ Railroad
- Building/Structure
- Site Boundary/Exclusion Area Boundary



V.C. Summer Overview

<u>Station Milestones</u>	<u>Year</u>
Initial License (2775 MWt)	1982
4.5% Uprate Approved (2900 MWt)	1996
Renewed License Issued	2004
Entered Period of Extended Operation	2022
Current License Expiration	2042

V.C. Summer Overview

- Westinghouse 3-loop PWR
- Refueling frequency – 18 months
- Regulatory Status
 - Reactor Oversight Process Actions Matrix Column 1
 - All ROP indicators are Green
- Recent capacity factors:

Year	Capacity Factor
2020	91.07
2021	82.69
2022	101.52
2023	88.82
2024	87.46

V.C. Summer Overview

Significant Plant Upgrades Since Initial License Renewal

- Fire Protection Piping & Valve Replacement Campaign
- Service Water Chemical Treatment Optimization
- Emergency Feedwater/Service Water Cured-In-Place-Pipe Liner Installation
- Main Transformer Replacement
- Electro-Hydraulic Control Digital Installation
- Service Water Cavitation Mitigation
- EDG Fuel Oil Piping Upgrade
- Safety-Related Chiller Replacements

Subsequent License Renewal Application

- Project Team Experience
 - V.C. Summer SLR is the 3rd Dominion SLR project performed by this team
 - Team also has experience from SLR projects with other utilities and initial license renewal projects
- Industry Involvement
 - Participant in peer reviews of other SLRAs
 - Active participant in the NEI License Renewal Task Force

Subsequent License Renewal Application

- Regulatory and Industry Guidance
 - Focused on consistency with NUREG-2191, NUREG-2192, NRC Interim Staff Guidance, and NEI 17-01
- Benchmarking
 - Recent SLR applications and correspondence (e.g., Supplements, RAIs) reviewed for insights
 - Built on Surry and North Anna SLR experience (e.g., leveraged Fleet programs, incorporated lessons learned from NRC reviews)
 - Conducted a peer review of our SLRA

Subsequent License Renewal Application

- Aging Management Reviews
 - High AMR consistency for SLR (>99% of AMR items use Notes A through E)
- Operating Experience
 - 10 years of station operating experience reviewed for aging-related insights
 - License renewal self-assessment performed in 2021
 - NRC IP 71003 inspection identified no findings or violations (2022)
- Aging Management Programs
 - 49 programs for SLR

Subsequent License Renewal Application

AMP Category	AMPs Consistent with GALL	AMPs Consistent with Enhancement	AMPs with Exceptions	AMPs with Exceptions and Enhancements	Plant Specific AMPs
Existing 40	13	22	2	3	0
New 9	9	0	0	0	0
Total 49					

Technical Topics

Service Water
Pond

EDG
Performance

Primary Shield
Wall & Reactor
Vessel Supports

Service Water Pond



Service Water Pond Aging Management

- Dams and embankments inspected for erosion, movement, surface cracks, sloughing, rip-rap failures, weed and brush control, animal burrows, etc – annually
- Dam elevation, alignment, and slope surveys are conducted – every 5 years
- Sedimentation – bottom elevation surveys (two) were conducted – enhancement to conduct on periodic basis
- Federal Energy Regulatory Commission dam inspection – every 3 years

EDG Performance

- VCSNS received a White performance deficiency identified when the licensee failed to identify and correct a condition adverse to quality for the Emergency Diesel Generator (EDG) fuel oil system that left the system vulnerable to piping cracks and eventually resulted in the failure of the 'A' EDG during testing on November 2, 2022.
 - The direct cause was a circumferential crack formed at the root of the last engaged male fuel oil pipe nipple thread. The crack propagated through-wall 140 degrees during a 24-hour surveillance run.
- VCSNS completed a Root Cause Evaluation (RCE) to further understand the organizational, process, and material aspects of the event.

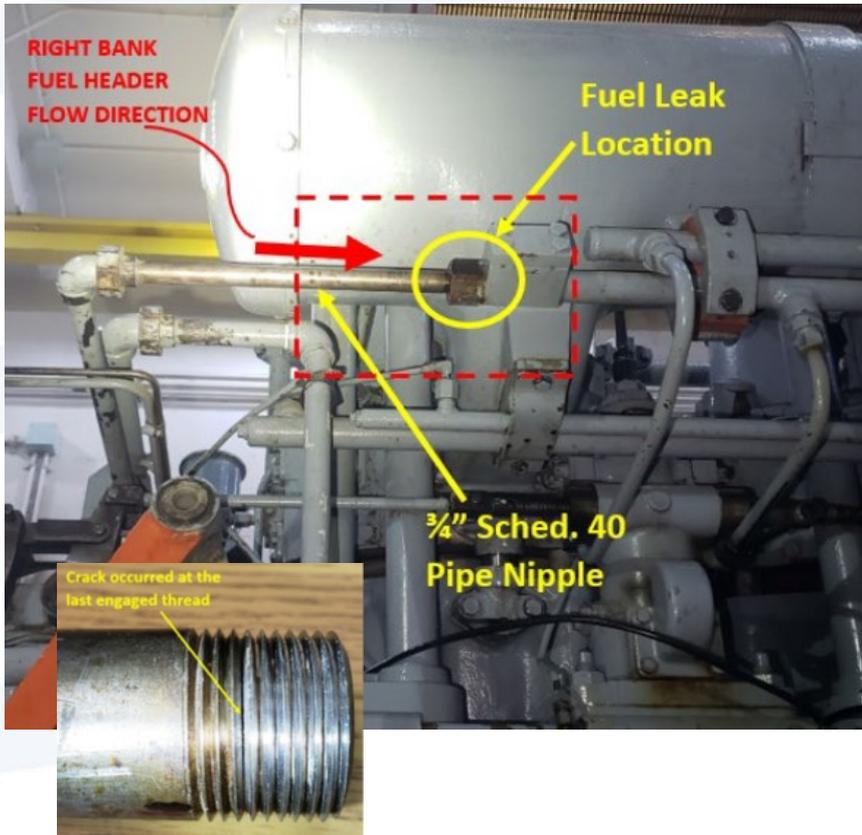
EDG Performance

- VCSNS pursued an EDG fuel oil piping design change, to improve the design margin of the system.
 - Replaced threaded schedule 40 piping with schedule 80, mostly welded joints, flexible hoses and flanged connection.
- Additionally, corrective actions from the RCE were completed to correct organization, equipment, and process issues identified.
 - Corrective Action Program and Plant Health process changes, and the Prevention Culture Model implementation
- All monthly and periodic EDG surveillance runs since the piping modification have been performed satisfactorily.

EDG Performance

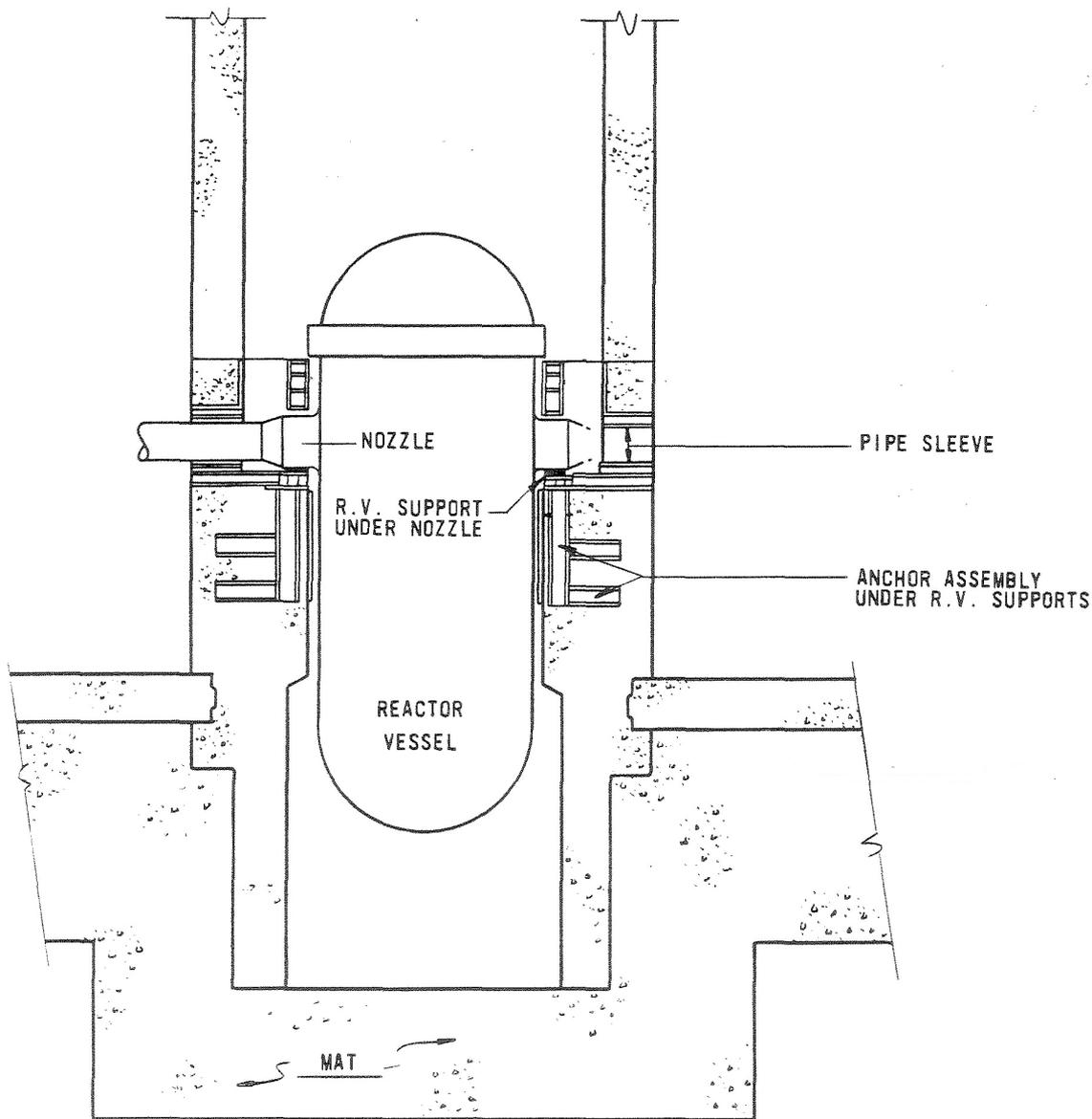
Piping Arrangement – Then

Piping Arrangement - Now



Technical Topics

Primary Shield Wall & RV Supports



V.C. Summer SLR Summary

- Dominion has produced a quality SLR application that has a high degree of consistency with GALL-SLR, and incorporates lessons learned from previous SLRAs
- The V.C. Summer SLRA was developed by the very experienced team that wrote the Surry and North Anna SLRAs
- Dominion Energy will continue to invest in people, program enhancements, and equipment modifications through the SPEO



**Advisory Committee on Reactor Safeguards
Virgil C. Summer Nuclear Station, Unit 1
Subsequent License Renewal Application (SLRA)
Safety Evaluation (SE)**

March 6, 2025

Marieliz Johnson, Project Manager
Steve Downey, Reactor Inspector

Presentation Outline

- Virgil C. Summer Nuclear Station (VC Summer), Unit 1 Licensing History
- VC Summer Aging Management Programs (AMPs)
- Specific Technical Areas of Review
- Inspections and Material Condition of the plant
- Conclusion on VC Summer SLRA Review

VC Summer, Unit 1: Licensing History

Initial License Renewal

Unit	Initial License	Initial License Renewal Application	Renewed License	Expiration Date
1	11/12/1982	8/6/2002	4/23/2004	8/6/2042

Subsequent License Renewal

Application Submitted	8/17/2023
Acceptance Determination	10/16/2023
Safety Evaluation	1/21/2025

VC Summer, Unit 1

Aging Management Programs

SLRA - Original Disposition of AMPs

- 49 AMPs in total
- 40 existing programs
 - 14 consistent with GALL-SLR
 - 26 consistent with enhancements and/or exceptions
- 9 new programs
 - All consistent

SE - Final Disposition of AMPs

- 49 AMPs in total
- 40 existing programs
 - 13 consistent with GALL-SLR
 - 27 consistent with enhancements and/or exceptions
- 9 new programs
 - All consistent

Specific Areas of SLRA Review

- Inspection of Water - Control Structures Associated with Nuclear Power Plants AMP
- Biological Shield Wall - Irradiated Concrete and Steel
 - primary shield wall fluence levels
 - inspections of reactor vessel supports

Region II AMP Inspections

License Renewal Inspection Program for Initial Period of Extended Operations

Inspection	Dates	Results
U1 & U2 IP 71003 Phase 1	October 11 – November 5, 2021 ML22026A345	No Findings
Unit 1 IP 71003 Phase 2	January 31 – February 18, 2022 ML22069B079	No Findings
Unit 1 IP 71003 Phase 4	Expected 2027 - 2032	NA

Region II: AMP Inspections

ROP Baseline Inspections

Inspection	Date	Aging Management Program
IP71111.08 ISI	Each outage	Boric Acid Corrosion Surveillance Bottom Mounted Instrumentation Inspection Containment ISI Program – IWE/IWL In-Service Inspection Plan Reactor Vessel Internals Inspection Steam Generator Management Program
IP71111.07 Heat Sink	Annually Triennial: 3Q 2022	Heat Exchanger Inspections Service Water System Reliability and In-Service Testing Program
IP 71111.21N.05 Fire Protection Triennial (FPTI)	3Q 2022	Ensure that selected SSCs are being managed for aging in accordance with the appropriate aging management programs
IP71111.21M Comprehensive Engineering Team Inspection (CETI)	2Q 2024	Ensure that selected SSCs are being managed for aging in accordance with the appropriate aging management programs
IP71111.12 Maintenance Effectiveness	7-8 samples per year	Maintenance Rule Structural Monitoring Program Service Water System Reliability and In-service Testing Program Inspections for Mechanical Components
IP71152 Problem Identification and Resolution (PI&R)	6-10 samples per year	Any applicable AMP based on conditions identified in the licensee's Corrective Action Program

Region II AMP Inspections

Resident Inspector Insight and Inspection Results

- No findings from License Renewal Program inspections
- 2023: White self-revealed finding related to the Emergency Diesel Generator (EDG) fuel oil system that left the system vulnerable to piping cracks and eventually resulted in the failure of the 'A' EDG during testing.



SLRA Review Conclusion

On the basis of its review of the SLRA, the staff determined that the requirements of 10 CFR 54.29(a) have been met for the subsequent license renewal of VC Summer, Unit 1.