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Attn: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

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NRA/YG: R0
Docket No.: 50-395
License No.: NPF-12

DOMINION ENERGY SOUTH CAROLINA, Inc. (DESC)
VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1
LICENSE AMENDMENT REQUEST LAR-20-142
REQUEST FOR TECHNICAL SPECIFICATION CHANGE
TECHNICAL SPECIFICATION 3.6.4, "CONTAINMENT ISOLATION VALVES"
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (RAI)

By letter dated April 30, 2020 (Agencywide Documents Access and Management System Accession No. ML20121A185), Dominion Energy South Carolina, Inc., (DESC) submitted a license amendment request (LAR) to modify Technical Specifications related to the containment isolation valves for Virgil C. Summer Nuclear Station (VCSNS), Unit No. 1. Specifically, the LAR requested a revision to the action statements associated with Technical Specification (TS) Limiting Condition for Operation (LCO) 3.6.4, "Containment Isolation Valves," to replace the term "valve" with the term "barrier" to encompass all components providing the containment isolation function and specify that actions to address an inoperable containment isolation valve apply to the affected penetration flow path only, rather than all flow paths associated with the penetration.

In an email dated December 7, 2020 from Mr. Vaughn Thomas, the VCSNS NRC Project Manager, to Mr. Yan Gao of Dominion Energy, the NRC staff requested additional information to facilitate their review of the subject LAR. The NRC's request for additional information (RAI) and the DESC's response are provided in the Enclosure to this letter.

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Enclosure

Response to NRC Request for Additional Information

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION
REQUEST FOR TECHNICAL SPECIFICATION CHANGE
TECHNICAL SPECIFICATION 3.6.4, "CONTAINMENT ISOLATION VALVES"
DOMINION ENERGY SOUTH CAROLINA, Inc. (DESC)
VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1

1.0 NRC REQUEST FOR ADDITIONAL INFORMATION (RAI) [6.2]

Background

By letter dated April 30, 2020 (Agencywide Documents Access and Management System Accession No. ML20121A185), Dominion Energy South Carolina, Inc., (Dominion) submitted a license amendment request to modify Technical Specifications related to the containment isolation valves for Virgil C. Summer Nuclear Station (VCSNS), Unit No. 1. Specifically, the licensee proposed to revise the action statements associated with Technical Specification (TS) Limiting Condition for Operation (LCO) 3.6.4, "Containment Isolation Valves," to replace the term "valve" with the term "barrier" to encompass all components providing the containment isolation function and specify that actions to address an inoperable containment isolation valve apply to the affected penetration flow path only rather than all flow paths associated with the penetration.

Title 10, "Energy," of the Code of Federal Regulations (10 CFR), Section 50.36(b) states, in part: "The technical specifications will be derived from the analyses and evaluation included in the safety analysis report, and amendments thereto, submitted pursuant to 10 CFR 50.34." As stated in 10 CFR 50.34, "Contents of Applications; Technical Information," the General Design Criteria (GDC) of Appendix A to 10 CFR Part 50 establishes minimum requirements for the principal design criteria for water-cooled nuclear power plants similar in design to plants for which construction permits have previously been issued by the Commission. Pursuant to 10 CFR 50.34, the facility safety analysis report includes a description of the relation of the design bases to the principal design criteria.

Section 6.2.4 of the VCSNS UFSAR addresses conformance with the General Design Criteria (GDC) of Appendix A to 10 CFR Part 50 related to containment isolation as follows:

The design of isolation barriers for lines penetrating the Reactor Building follows the requirements of General Design Criteria 54 through 57 of 10CFR50, Appendix A.

Guidance for staff review of TSs is contained in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 16.0, "Technical Specifications." The Nuclear Regulatory Commission (NRC) staff has prepared standard technical specifications (STS) for each of the light-water reactor nuclear steam supply systems and associated balance-of-plant equipment systems. The guidance specifies that the staff review whether content and format of proposed TS are consistent with the applicable STS. Where TS provisions depart from

the reference TSs, the staff determines whether proposed differences are justified by uniqueness in plant design or other considerations. The applicable current STS for VCSNS are contained in NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," Revision 4.0.

RAI 1: Maintenance of One Operable Isolation Barrier

Regulatory Basis:

- In accordance with 10 CFR Part 50, Appendix A, GDC 54—Piping systems penetrating containment. Piping systems penetrating primary reactor containment shall be provided with leak detection, isolation, and containment capabilities having redundancy, reliability, and performance capabilities which reflect the importance to safety of isolating these piping systems.
- In accordance with 10 CFR 50.36(c)(2), limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility, and the licensee shall shutdown the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.

Discussion

Condition A of STS 3.6.3 in NUREG-1431 applies when one or more penetration flow paths with one containment isolation valve (CIV) inoperable and the CIV pressure boundary intact. The associated required action specifies isolation of the affected penetration flow path.

In Section 3.0, "Technical Evaluation," of the Enclosure to the license amendment request, Dominion stated:

A change is being requested to TS 3.6.4 to incorporate the term "penetration flow path" in place of "penetration". The current TS does not differentiate between "penetration" and "penetration flow path". In the event a CIV is inoperable and there are multiple CIVs in the affected penetration, the current TS can be interpreted to require isolation of all valves in the affected penetration, regardless of operability. The proposed change clarifies the station's desire to only isolate the inoperable valve in the affected flow path that is needed to maintain containment integrity.

The proposed TS 3.6.4 action with one or more containment isolation valves inoperable includes the provision to "maintain at least one isolation barrier OPERABLE in the affected penetration(s)...." The staff interprets the intent of this provision as ensuring that no more than one CIV is inoperable in an affected penetration flow path. However, the proposal does not necessarily limit the OPERABLE isolation barrier to the affected flow path because the phrase "affected penetration flow path" was not used in the first part of the action statement and an affected penetration may connect to multiple branch lines, each with a separate isolation barrier. Thus, the proposed provision does not clearly prohibit a temporary loss of isolation function condition for a penetration connected to multiple branch lines, which is inconsistent with the corresponding STS 3.6.3 Condition A.

Request

Propose a TS 3.6.4 action statement that ensures at least one OPERABLE isolation barrier would be present in each penetration flow path affected by an inoperable CIV.

1.1 DESC/VCSNS Response

The proposed TS 3.6.4 action with one or more containment isolation valves inoperable includes the provision to "maintain at least one isolation barrier OPERABLE in the affected penetration(s)....". DESC recognizes that the proposed action statement does not necessarily limit the OPERABLE isolation barrier to the affected flow path. An affected penetration may contain multiple flow paths, each with separate isolation barriers. To clarify the intent of the proposed change, DESC proposes to replace the proposed action statement as follows:

"With one or more of the isolation valve(s) inoperable, maintain at least one isolation barrier OPERABLE in each affected penetration flow path and:"

Sections 2 and 3 provide the revised TS mark-up and clean TS pages, respectively, to accurately reflect the proposed change.

In addition, for information, Section 4 presents the associated revised TS Bases mark-up page.

2.0 REVISED TS MARK-UP PAGE

CONTAINMENT SYSTEMS

3/4.6.4 CONTAINMENT ISOLATION VALVES

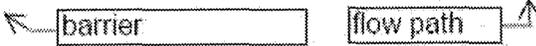
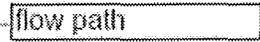
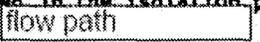
LIMITING CONDITION FOR OPERATION

3.6.4 Each containment isolation valve shall be OPERABLE.*

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one or more of the isolation valve(s) inoperable, maintain at least one isolation valve OPERABLE in each affected penetration that is open and either:

- 
- a. Restore the inoperable valve(s) to OPERABLE status within 4 hours, or
- 
- b. Isolate each affected penetration within 4 hours by use of at least one deactivated automatic valve secured in the isolation position, or
- 
- c. Isolate each affected penetration within 4 hours by use of at least one closed manual valve or blind flange, or
- d. Be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The provisions of Specification 3.0.4 do not apply.

SURVEILLANCE REQUIREMENTS

4.6.4.1 Each containment isolation valve shall be demonstrated OPERABLE prior to returning the valve to service after maintenance, repair, or replacement work is performed on the valve or its associated actuator, control, or power circuit by performance of a cycling test and verification of isolation time.

4.6.4.2 Each containment isolation valve shall be demonstrated OPERABLE during the COLD SHUTDOWN or REFUELING MODE AT LEAST ONCE PER 18 MONTHS BY:

- Verifying that on a Phase A containment isolation test signal, each Phase A isolation valve actuates to its isolation position.
- Verifying that on a Phase B containment isolation test signal, each Phase B isolation valve actuates to its isolation position.
- Verifying that on a Reactor Building Purge and Exhaust isolation test signal, each Purge and Exhaust valve actuates to its isolation position.

*Locked or sealed closed valves may be opened on an intermittent basis under administrative control.

3.0 CLEAN TS PAGE

CONTAINMENT SYSTEMS

3/4.6.4 CONTAINMENT ISOLATION VALVES

LIMITING CONDITION FOR OPERATION

3.6.4 Each containment isolation valve shall be OPERABLE. *

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one or more of the isolation valve(s) inoperable, maintain at least one isolation barrier OPERABLE in each affected penetration flow path and:

- a. Restore the inoperable valve(s) to OPERABLE status within 4 hours, or
- b. Isolate each affected penetration flow path within 4 hours by use of at least one deactivated automatic valve secured in the isolation position, or
- c. Isolate each affected penetration flow path within 4 hours by use of at least one closed manual valve or blind flange, or
- d. Be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The provisions of Specification 3.0.4 do not apply.

SURVEILLANCE REQUIREMENTS

4.6.4.1 Each containment isolation valve shall be demonstrated OPERABLE prior to returning the valve to service after maintenance, repair, or replacement work is performed on the valve or its associated actuator, control, or power circuit by performance of a cycling test and verification of isolation time.

4.6.4.2 Each containment isolation valve shall be demonstrated OPERABLE during the COLD SHUTDOWN or REFUELING MODE AT LEAST ONCE PER 18 MONTHS BY:

- a. Verifying that on a Phase A containment isolation test signal, each Phase A isolation valve actuates to its isolation position.
- b. Verifying that on a Phase B containment isolation test signal, each Phase B isolation valve actuates to its isolation position.
- c. Verifying that on a Reactor Building Purge and Exhaust isolation test signal, each Purge and Exhaust valve actuates to its isolation position.

* Locked or sealed closed valves may be opened on an intermittent basis under administrative control.

4.0 REVISED TS BASES MARK-UP PAGE

Insert 1

The containment isolation valves form part of the containment pressure boundary and provide a means for fluid penetrations not serving accident consequence limiting systems to be provided with two isolation barriers that are closed on a containment isolation signal. These isolation barriers are either passive or active (automatic). Manual valves, de-activated automatic valves secured in their closed position, blind flanges, and closed systems are considered passive isolation barriers. Automatic valves designed to close without operator action following an accident are considered active isolation barriers. Two barriers in series are provided for each penetration so that no single credible failure or malfunction of an active component can result in a loss of isolation or leakage that exceeds limits assumed in the safety analyses. One of these barriers may be a closed system. An inoperable valve may be used to isolate the affected penetration per TS 3.6.4.b/c if the valve is in the closed position (i.e. failed closed or stuck closed) and has power removed, if so equipped.

flow paths

flow path

flow path

5.0 NO SIGNIFICANT HAZARDS CONSIDERATION

The proposed response to the RAI has been reviewed against the “No Significant Hazards Consideration Determination Analysis” presented in the original LAR submittal [6.1], and it has been determined that this RAI response has no impact on the conclusions of the previous “No Significant Hazards Consideration Determination Analysis.”

6.0 REFERENCES

- 6.1 Dominion Energy South Carolina (DESC) Virgil C. Summer Nuclear Station (VCSNS) Unit 1 License Amendment Request LAR-20-142, Request for Technical Specification Change, Technical Specification 3.6.4, “Containment Isolation Valves” (ADAMS Accession No. ML20121A185)
- 6.2 Request for Additional Information (ADAMS Accession No. ML20259A347)
- 6.3 Email from Mr. Vaughn Thomas (NRC) to Mr. Yan Gao (DESC), dated December 7, 2020, “Final RAI for Summer LAR - TS 3.6.4”