



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

March 19, 2021

LICENSEE: Southern Nuclear Operating Company, Inc.

FACILITY: Vogtle Electric Generating Plant, Units 1 and 2

SUBJECT: SUMMARY OF MARCH 12, 2021, PUBLIC MEETING WITH SOUTHERN NUCLEAR OPERATING COMPANY, INC., REGARDING A PROPOSED LICENSE AMENDMENT REQUEST TO CHANGE THE TECHNICAL SPECIFICATION RELATED TO MAIN STEAM ISOLATION VALVES FOR VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2 (EPID NO. L-2021-LRM-0026)

On March 12, 2021, an Observation meeting formally known as a Category 1 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of Southern Nuclear Operating Company, Inc. (SNC, the licensee). The purpose of the meeting was for SNC to describe its plan to submit a license amendment request (LAR) to change the Technical Specification (TS) related to the main steam isolation valves (MSIVs) for Vogtle Electric Generating Plant, Units 1 and 2 (Vogtle). SNC plans to submit a LAR to revise TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," that would propose to eliminate one of the two MSIVs in each steam line.

A list of attendees is provided as an Enclosure.

On February 19, 2021 (Agencywide Document and Access Management System (ADAMS) Accession No. ML21050A058), the meeting was noticed on the NRC public webpage.

The SNC presented slides are located in ADAMS Accession No. ML21067A761.

### Introduction

The NRC staff opened the meeting with introductory remarks and an introduction of the attendees.

The SNC staff discussed the following topics: (1) current design, (2) proposed design, (3) proposed TS, (4) technical topics, and (5) milestones.

SNC stated that there have been six trips at Vogtle since 2012, due to the inadvertent closure of one MSIV in a steam line. SNC plans to change the licensing basis and design from two MSIV systems per steam line to one MSIV system per steam line. The licensee said that this proposed change will reduce number of components that could cause inadvertent closure of MSIVs, reduce single point vulnerabilities, and will be consistent with other pressurized-water reactors (PWRs).

The following are the 6 Vogtle trips due to MSIVs since 2012.

Plant	Event Date	LER #	Power	ADAMS #	Cause
Vogtle, Unit 1	10/8/2012	2012-005	10%	ML12339A190	Loop 2 and 3 outboard MSIVs were closed but indicated open. Follow up ultrasonic testing (UT) identified stem length discrepancies on both MSIVs. Following valve disassembly, it was identified the valve stems were sheared above the T-head. Westinghouse representatives were consulted and conveyed to the site the material used for the MSIV stems, ASME SA564 Gr. 630 condition H1075, is susceptible to embrittlement when exposed to temperatures above 500°F. Metallurgy analysis was performed on the sheared stems validating that thermal embrittlement was the failure mechanism. The failure analysis concluded the stem fracture was a sudden failure which occurred during the opening of the valves. UT and visual inspections were performed on the remaining 6 MSIV stems for Unit 1 with no significant stem fractures detected.
Vogtle, Unit 1	4/12/2014	2014-002	28%	ML14156A521	The direct cause of the event was a failed O-ring on the Loop 1 Train B MSIV lower manifold-to-cylinder mating surface resulting in a loss of hydraulic oil pressure. The root cause was misalignment of the lower manifold-to-cylinder mating surface during valve reassembly.
Vogtle, Unit 2	3/14/2015	2015-001	100%	ML15133A299	Loop 3 outboard MSIV spuriously closed. The sudden closure of the steam isolation valve caused a rapid pressure reduction in the remaining three [steam generators] SGs due to increased steam flow resulting in a Reactor Protection System (RPS) actuation due to rate compensated Low Main Steam Line Pressure Safety Injection and Steam Line Isolation.

Plant	Event Date	LER #	Power	ADAMS #	Cause
Vogtle, Unit 1	2/3/2017	2017-001	100%	ML17093A605	Loop 1 Outboard MSIV began drifting closed due to hydraulic oil leak.
Vogtle, Unit 2	3/30/2019	2019-001	30%	ML19148A469	The number 4 MSIV unexpectedly closed due to the failure of a control relay coil. The cause of the event was a failure of a control relay coil due to infant mortality.
Vogtle, Unit 2	7/19/2019	2019-002	100%	ML19247C285	The Loop 2 'B' MSIV failed closed. This failure was the result of a Honeywell LSYHC3K microswitch failure in the MSIV control circuitry due to water intrusion and subsequent corrosion of the microswitch wires. When this microswitch failed, it caused one of the MSIV dump solenoid valves to open which closed the MSIV.

SNC stated that the MSIV function is to limit blowdown to one steam generator (SG) in the event of a steam line break in order to (1) limit the related effect upon the reactor core within specified fuel design limits, and (2) limit containment pressure to a value less than 90-percent of design pressure. The licensee said that the isolation system provides positive shutoff with minimum leakage during postulated line severance conditions either upstream or downstream of the valves. SNC stated the MSIV safety function will be preserved.

Current Design

SNC stated that the MSIVs, MSIV bypass valves, and piping are designed to prevent uncontrolled blowdown from more than one SG. The licensee said that for main steam line breaks (MSLBs) upstream of an MSIV, uncontrolled blowdown from more than one SG is prevented by the MSIVs in the unaffected steam lines and by the MSIV in the affected line. SNC stated that for MSLBs downstream of an MSIV, blowdown from more than one SG is prevented by the MSIVs on each main steam line. The licensee said that each MSIV and MSIV bypass valve in a steam line is actuated from a separate actuation train (SLI-A or SLI-B).

SNC stated that each MSIV is a bidirectional gate valve composed of a valve body, which is welded into the system pipeline. The licensee said that positive sealing can be maintained in either direction. SNC said that the MSIV bypass valves are used when the MSIVs are closed to permit warming of the main steam lines prior to startup, and the bypass valves are air-operated globe valves. SNC stated that for emergency closure, the valve solenoid, when deenergized, will result in the MSIV bypass valve closure, and the electrical solenoids are energized from a separate Class IE source.

SNC said that the Limiting Condition of Operation (LCO) 3.7.2 states that two MSIV systems per steam line shall be OPERABLE.

### Proposed Design

SNC stated that the proposed design will retain the existing inboard MSIVs – one per steam line, which is a bi-directional gate valve. The licensee said that it will determine the method of eliminating existing outboard MSIV function. SNC said it plans to retain both existing MSIV bypass valves, and it plans to change the actuation of MSIV closure to include both actuation trains on each inboard MSIV. The licensee said that the MSIV bypass actuation would not change, as both valves remain in the steam line.

SNC said that it will assure that, in the event of a postulated break in a main steam line in a PWR plant, the design will preclude the blowdown of more than one SG, assuming a concurrent single active component failure. The licensee stated that in this regard, all main steam shutoff valves downstream of the MSIVs, the turbine stop valves, and the control valves are considered functional. SNC said that each MSIV actuator is designed to accomplish its function with a single active component failure, and the turbine stop valves and turbine bypass valves are assumed to be functional. The licensee said that each inboard MSIV actuator for each steam line will be actuated from two separate trains (SLI-A or SLI-B).

### Proposed TS

SNC said that the proposed LCO 3.7.2 will change to remove the requirement for two MSIV systems per steam line, and one MSIV per steam line is proposed. The licensee stated that the Required Actions and Surveillance Requirements will be updated accordingly to reflect the design change, and the proposes changes generally consistent with NUREG-1431.

### Technical Topics

SNC said that each MSIV is a bidirectional gate valve composed of a valve body, which is welded into the system pipeline, and the MSIV design and installation is not changed. The licensee stated that the two redundant train-oriented steam line isolation signals (SLI-A, SLI-B) are initiated upon receipt of any of the following signals: (1) high steam line pressure rate, (2) low steam line pressure, (3) containment high-2 pressure, and (4) manual actuation. SNC said that the actuation signals will not be changed. The licensee stated that the actuators are being replaced with new design system media actuators. SNC said it will evaluate any impact of the valve closure timing due to a change in actuators.

The licensee said that no single active component failure will result in the failure of more than one MSIV to operate. SNC stated that the MSIV actuator closes the valve assuming a single failure, and the dual paths supply steam for closure. The licensee stated that Train A and B closure signal will be sent to the actuator. SNC stated that the signals are generated from separate instrumentation and powered by separate instrumentation control systems. The licensee stated that the new design will provide the safety function assuming single active failure, and the new design credits operation of turbine stop valves, turbine bypass valves to limit blowdown to only one SG.

SNC stated that the Updated Final Safety Analysis Chapter 15 and Chapter 6 analyses will be evaluated/investigated to determine impact, if any, of the removal of the closure function of the outboard MSIV. Specifically, the licensee said that it will evaluate (1) the impact to mass and energy release and associated containment response regarding reverse flow into containment due to single MSIV failure in the ruptured loop, (2) the impact to reactor response analysis regarding the bounded by the current single failure of a train of engineered safety feature for

boration and the stuck highest worth rod cluster control assembly, (3) the impact to radiological analyses resulting from secondary side transients regarding the bounded by current single failure assumption of stuck open atmospheric relief valve, and SG tube rupture margin-to-overfill, and (4) the impact to environmental qualification (EQ) of equipment.

SNC said that it will confirm that the main steam piping and support system will continue to withstand the dynamic effects (seismic/pipe rupture) of (1) quick valve closure of the MSIVs and turbine stop valves, and (2) the reaction forces of safety, atmospheric, and steam dump valves. The licensee stated that it will determine if the analyses for high energy line breaks (HELBs) outside of containment are affected, and it will determine impacts to pipe stress, pipe support, civil, and seismic calculations. SNC stated that it will evaluate the need for new supports and structural evaluations for new enclosures and conduits.

SNC said that the mechanical systems review is needed to determine the impacts of (1) heating, ventilation, air-conditioning/heat gain due to addition of electrical components/panels, (2) Fire Protection/combustibles due to new material/components, and (3) inservice inspection/inservice testing program.

SNC stated that the current licensing basis has the following:

- The containment penetrations associated with the secondary side of the SGs are not subject to General Design Criterion (GDC) 57,
- The valves associated with these penetrations do not receive a containment isolation signal and are not credited with effecting containment isolation in the safety analyses,
- The barriers against fission product release to the environment are the SG tubes and the piping associated with the SGs, and
- No changes to the licensing basis for containment isolation are needed.

SNC stated that redundant power supplies and power trains operate the MSIVs and MSIV bypass valves to isolate safety- and non-safety-related portions of the system. The licensee said that the impacts of the change in the actuator will be evaluated. SNC also stated that the impacts to 125-volt direct current battery and battery chargers for providing power to the solenoids will be evaluated. The licensee said that the impact of valve closure timing due to addition of control circuit surge protection devices will be evaluated.

SNC said that the flow of the main steam entering the high-pressure turbine is controlled by four stop valves and four governing control valves, and each 28-inch stop valve is controlled by an electrohydraulic actuator, so that the stop valve is either fully open or fully closed. The licensee said that the function of the stop valves is to shut off the steam flow to the turbine, when required, and the stop valves are closed within 0.3 seconds by actuation of the emergency trip system devices. SNC stated that these devices are independent of the electronic flow control logic. The licensee said that a reactor trip is one of the actuation signals for the turbine stop valves, and a reactor trip signal is generated following a MSLB. SNC said that the turbine stop valves are closed when the unit is in MODE 2 or below, and the turbine stop valves are designed to close against full steam pressure supplied to the turbine.

SNC stated that the turbine bypass valve system consists of a manifold connected to the main steam lines upstream of the turbine stop valves and of lines from the manifold with regulating valves to each condenser shell. The licensee said that the system is designed to directly bypass 40-percent of the valve-wide-open main steam flow to the condenser. SNC said that the turbine bypass valves fail in the closed position on loss of instrument air or electrical supply to a valve, and the valves are capable of going from the fully open to the fully closed position within 5 seconds after de-energization of the solenoid valves over the pressure range of 100 to 1185 pounds per square inch gauge. The licensee stated that the position switches are provided on the bypass valves, and fully open and fully closed position signals are transmitted to the main control room.

### Milestones

SNC plans to submit the proposed LAR by end of the third quarter of 2021 (July to September 2021). SNC plans to request NRC approval prior to Vogtle, Unit 2, refueling outage (RFO) 2R22, which begins March 5, 2022. SNC said it plans to implement the proposed MSIV change during Vogtle, Unit 2, RFO 2R22, and Vogtle, Unit 1, RFO 1R24, which begins March 13, 2023.

### NRC Questions to SNC

The NRC staff questioned if the high energy line break (HELB) analysis downstream of the MSIVs is bounding the existing analysis or if SNC would be performing a re-analysis. SNC said that evaluation still needs to be done. The NRC staff asked why Vogtle has 2 MSIVs in each steam line. SNC stated that it would include that information in the proposed LAR. The NRC staff questioned the TS Required Actions and Surveillance Requirements changes since Vogtle has risk-informed completion times. SNC said that evaluation still needs to be done. The NRC staff asked about the outboard MSIV signal being from Train B. SNC said the inboard MSIV would have signals from both Train A and Train B. The NRC staff questioned if some analyzes take credit for two MSIVs in each steam line. SNC said that evaluation still needs to be done. The NRC asked if the Advisory Committee on Reactor Safeguards (ACRS) should review this LAR. ACRS has authority to review anything in its purview. The NRC staff plans to forward the LAR to ACRS after it is submitted. The NRC staff questioned what is the risk impact of the proposed LAR and if the proposed LAR creates "special circumstances" as related to Appendix D of Standard Review Plan 19.2, "Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance" (ADAMS Accession No. ML071700658). The licensee stated that evaluation still needs to be done. The NRC asked if allowed MSIV leakage is higher for each valve because here are two valves in each steam line and if MSIV leakage may need to be more limiting for single MSIV operation. SNC said that evaluation still needs to be done. The NRC staff asked about GDC 57 as related to the MSIV. SNC stated that the containment penetrations associated with the secondary side of the SGs are not subject to GDC 57. The NRC asked about the other signals that go to the MSIVs as related to GDC 57, "Closed Systems Isolation Valves." SNC said that evaluation still needs to be done. The NRC staff questioned when the proposed LAR would be submitted. SNC said it is planning to submit it by September 30, 2021. The NRC staff questioned when SNC needed the proposed LAR to be completed. SNC stated that Vogtle needs it by March 5, 2022. The NRC staff pointed out that is essentially a 5-month completion request for a complicated change. The NRC staff stated that it may be a challenge to complete the review within 5 months and that SNC should have a contingency plan if the NRC is not able to complete its review within 5 months.

Public Questions to NRC

There were no members of the public in attendance.

Closing

SNC stated that it would request another pre-submittal meeting in a few months.

The NRC staff made no regulatory decisions during the meeting.

Once received, the NRC staff will perform a thorough review of the proposed LAR and make any regulatory decisions in writing in a timely manner.

Public Meeting Feedback forms were available, but no comments were received.

The meeting adjourned at 10:58 am (Eastern time).

Please direct any inquiries to me at 301-415-3100.

***/RA/***

John G. Lamb, Senior Project Manager  
Plant Licensing Branch, II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-424 and 50-425

Enclosure: List of Attendees

cc w/encls: Distribution via Listserv

LIST OF ATTENDEES

MARCH 12, 2021, PUBLIC MEETING WITH SOUTHERN NUCLEAR COMPANY  
REGARDING A PROPOSED LICENSE AMENDMENT REQUEST TO CHANGE THE  
TECHNICAL SPECIFICATION RELATED TO THE MAIN STEAM ISOLATION VALVES  
VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2

<u>ATTENDEE</u>	<u>REPRESENTING</u>
John G. Lamb	U.S. Nuclear Regulatory Commission (NRC)
Caroline Tilton	NRC
Matt Hamm	NRC
Vic Cusumano	NRC
Steve Jones	NRC
Brian Wittick	NRC
Bob Pascarelli	NRC
Stacey Rosenberg	NRC
Alissa Neuhausen	NRC
Mark Blumberg	NRC
Kevin Hsueh	NRC
Todd Hilsmeier	NRC
Joshua Wilson	NRC
Shilp Vasavada	NRC
Ken Lowery	Southern Nuclear Operating Company (SNC)
Jamie Coleman	SNC
Cheryl Gayheart	SNC
Lyndon Baines	SNC
Jerimiah Gilbreath	SNC
Matthew Horn	SNC
Tom Kindred	SNC
Patricia Furio	Enercon
Janet Caldwell	Enercon
Nathan Raines	Enercon



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**ADAMS Accession Nos.:**

**PKG ML21056A607**

**Meeting Notice ML21050A058**

**Meeting Summary ML21074A030**

**Slides ML21067A761**

OFFICE	DORL/LPL2-1/PM	DORL/LPL2-1/LA	DSS/STSB/BC	DORL/LPL2-1/BC	DORL/LPL2-1/PM
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