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

September 10, 2021

LICENSEE: Southern Nuclear Operating Company, Inc.

FACILITY: Vogtle Electric Generating Plant, Units 1 and 2

SUBJECT: SUMMARY OF AUGUST 25, 2021, PUBLIC PRE-SUBMITTAL 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-0084)

On August 25, 2021, an observation 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 pre-submittal meeting was for SNC to describe its plan to submit a license amendment request (LAR) to change a Technical Specification (TS) related to the main steam isolation valves (MSIVs) for Vogtle Electric Generating Plant, Units 1 and 2 (Vogtle). SNC proposed to submit a LAR to revise TS 3.7.2, "Main Steam Isolation Valves (MSIVs)." SNC proposed to revise Vogtle's TS 3.7.2 to remove one of the two MSIV systems from the Limiting Condition for Operation (LCO). SNC proposed to eliminate one of the two MSIVs in each steam line. This is a follow-up pre-submittal meeting to the pre-submittal meeting held on the same topic on March 12, 2021 (Agencywide Document and Access Management System (ADAMS) Accession No. ML21074A030).

A list of attendees is provided as an Enclosure.

On August 12, 2021 (ADAMS Accession No. ML21224A202), the meeting was noticed on the NRC public webpage.

The SNC presented slides contained in ADAMS Accession No. ML21230A284.

Introduction

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

The SNC staff discussed the following topics: (1) current design, (2) proposed design, (3) proposed TS, (4) technical topics, (5) probabilistic risk assessment (PRA) risk insights, and (6) milestones.

SNC stated that there have been 6 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 the 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, American Society of Mechanical Engineers (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 1he 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 0-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.
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

Plant	Event Date	LER #	Power	ADAMS #	Cause
					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 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.

SNC stated that each MSIV is a bi-directional gate valve composed of a valve body, which is welded into the system pipeline. The license 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.

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 eliminate existing outboard MSIV function. SNC said it plans to retain the outboard valve with capability for manual closure. The licensee stated that the outboard valve will not receive steam line isolation (SLI) signal. SNC said that it will retain both existing MSIV bypass valves. The licensee stated that it would change actuation of the MSIV closure to include both actuation trains on each inboard MSIV. SNC said that the MSIV bypass actuation would not change, as both valves will remain in the steam line.

SNC stated that all main steam shutoff valves downstream of the MSIVs, the turbine stop valves, and the control valves would be considered to be functional. The licensee said that each MSIV actuator is designed to accomplish its function with a single active component failure.

Proposed TS

SNC said that the proposed LCO 3.7.2 would be changed to replace two MSIV systems per steam line with four MSIVs and associated actuators and bypass valves; the licensee stated that it would reflect one MSIV per steam line (four steam lines total). SNC stated that the current “REQUIRED ACTION” “B” and “D” in TS 3.7.2 would be deleted. SNC asserted that REQUIRED ACTION “B” and “D” in TS 3.7.2 would not be needed with only one MSIV per steam line. The licensee stated that it would add actuator “CONDITION” to TS 3.7.2 in accordance with TSTF-504, “Revised the MSIV and MFIV Specs to Provide Actions for Actuator Trains.” SNC said that it would add a bypass valve “CONDITION” to TS 3.7.2. The licensee stated that the existing “SURVEILLANCE REQUIREMENT” in TS 3.7.2 would be updated to

reflect the proposed LCO. SNC stated that it would add a "SURVEILLANCE REQUIREMENT" in TS 3.7.2 for actuators. SNC said that its proposed changes would be generally consistent with TSTF-504 and NUREG-1431, "Standard Technical Specifications, Westinghouse Plants, Revision 4.0, Volume 1, Specifications" April 2012 (ADAMS Accession No. ML12100A222).

Technical Topics

SNC stated that each MSIV is a bi-directional gate valve composed of a valve body, which is welded into the system pipeline. The licensee said that the MSIV design function would not be changed. SNC said that the actuators would be replaced with a new design system media actuator. The licensee stated that two redundant train-oriented steam line isolation signals (SLI-A, SLI-B) would be 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 stated that the actuation signals would not be changed.

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

SNC stated that Chapter 6 and Chapter 15, Updated Final Safety Analysis Report (UFSAR) analyses have been evaluated/investigated to determine impact of the removal of the closure function of the outboard MSIV. The licensee said that it evaluated the impact to mass and energy release and associated containment response and that SNC observed reverse flow into containment due to single MSIV failure in ruptured loop, and small increases in peak containment temperature and pressure. SNC stated that the UFSAR would be updated to reflect the proposed updated analysis. SNC also said it evaluated the impact to reactor response analysis and stated that there would be no impact. SNC stated that it evaluated the impact to radiological analyses resulting from secondary side transients, and SNC said that it is bounded by the current single failure assumption of stuck open atmospheric relief valve (ARV). SNC stated that it evaluated the SG Tube Rupture Margin to Overfill Analysis, and said that that the analysis is bounded by current single failure assumption of stuck open ARV. SNC stated that it evaluated the impact to environmental qualification (EQ) of equipment, and suggested that there would be increases in peak containment pressure/temperature and those increases would be addressed for impacted equipment.

SNC stated that it would confirm that the main steam piping and support system will continue to withstand the dynamic effects of (1) quick valve closure of the MSIVs and turbine stop valves; and (2) reaction forces of safety, atmospheric, and steam dump valves. The licensee said that the piping containing the MSIVs qualifies as "No Break Zone" piping both before and after MSIV actuator replacement. SNC said that the pipe stress and pipe supports are within allowable load limits. SNC stated that the Seismic Category I design and evaluations are completed for new enclosures and conduits.

SNC stated that it completed its review of the Mechanical systems and determined that (1) the Heating, Ventilation and Air-Conditioning system has margin to accommodate the heat gain due to addition of electrical components/panels, (2) the combustible load of affected fire areas/zones

due to new material/components remain with allowable limits, and (3) Inservice Inspection/Inservice Testing (ISI/IST) program will complete the Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a evaluation for ISI/IST plan changes.

SNC stated that the containment penetrations associated with the secondary side of the steam generators are not subject to General Design Criterion 57. The licensee said that 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. SNC said that the barriers against fission product release to the environment are the SG tubes and the piping associated with the SGs. The licensee said that no changes to the licensing basis for containment isolation would be needed.

SNC stated that there would be redundant power supplies and power trains to operate the MSIVs and MSIV bypass valves to isolate safety and non-safety related portions of the system. SNC said that the impacts of the proposed change in the actuator were evaluated. SNC stated that the battery chargers and 125-volt direct current (DC) battery have adequate margin to accommodate the increase in load for providing power to solenoids. The licensee stated that it would add a short time delay prior to valve stroke in the control circuit surge protection devices. SNC said that it would be accounted for in the valve closure time curve.

SNC stated that the flow of the main steam entering the high-pressure turbine is controlled by four stop valves and four governing control valves.

SNC stated that the turbine bypass 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.

PRA Risk Insights

SNC stated that the proposed LAR would not be a risk-informed LAR. The licensee said it would include PRA insights in the proposed LAR. The licensee said that modification will be assessed per model maintenance procedures for consideration of immediate update or scheduled update. SNC stated that the proposed LAR would include a summary of design change risk significance (i.e., delta core damage frequency (CDF) and delta large early release frequency (LERF) associated with current MSIV configuration versus future modified MSIV configuration), and Risk-Informed Completion Time (RICT) impact for (1) internal events (<1-percent increase in CDF & LERF), (2) internal flooding (<0.1-percent increase in CDF and LERF), (3) fire (<0.1-percent increase in CDF and LERF), and (4) seismic (2.2-percent increase in CDF, 4-percent increase in LERF).

SNC stated that the proposed LAR would include information supporting RICT option for “one MSIV inoperable in MODE 1” condition (current TS has RICT option for “one or more steam line with one MSIV system inoperable in MODE 1”) for (1) PRA success criteria, comparison with Design Basis success criteria, (2) sample RICT calculations using conceptual impact model, (3) total estimated CDF and LERF values from conceptual impact model, (4) review for impact on seismic penalty factor, (5) review for impact on analyses of external hazards, and (6) review for impact on uncertainty analysis.

Milestones

SNC plans to submit the proposed LAR by end of the third quarter of 2021 (July – September 2021). SNC plans to request NRC approval 12 months after the submittal. SNC stated that it plans to implement the proposed LAR during Vogtle, Unit 1, refueling outage (RFO) 1R24, which begins spring 2023, and Vogtle, Unit 2, RFO 2R23, which begins fall 2023.

NRC Questions to SNC

The NRC staff questioned if there is a TS Definition for the Main Steam System, if there were any new signals, if there is credit taken for blowdown inside containment, single failure, closing time of the MSIV, seismic and EQ impacts, and did SNC look at plants with non-return valves.

NRC staff asked the licensee whether the PRA changes associated with the proposed LAR constitute a PRA upgrade or PRA maintenance update, as defined in the PRA Standard, as qualified by Regulatory Guide (RG) 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," March 2009 (ADAMS Accession No. ML090410014). The licensee explained that the PRA changes are not considered a PRA upgrade, and, therefore, do not require a peer review in accordance with RG 1.200. Because the plant and PRA changes associated with the proposed LAR impact the RICT program, the NRC staff requested that the information supporting the RICT program change proposed for the LAR also include a summary of the changes made to the PRA (including any new operator actions).

The NRC staff questioned if the LAR will discuss the impact of the proposed change on the design basis radiological accidents described in the UFSAR. The NRC staff said that it would be beneficial if this information was included.

The NRC staff questioned if SNC will provide a justification in the LAR for crediting the non-safety-related turbine stop valves in safety-related analyses. The NRC staff stated that it would be beneficial if this information was included.

The NRC staff asked whether SNC knew if the second MSIV was included for design or regulatory reasons and whether those reasons would be addressed once the second MSIV was removed from the TSs. The NRC staff suggested the licensee include the original design and licensing basis for the second MSIV requirement and justify the basis for the change.

SNC stated that radiological analyses from secondary side transients are bounded by the current single failure assumption of a stuck open ARV. The NRC staff suggested SNC fully described the logic and justification in the LAR.

The NRC staff suggested SNC include the following in the proposed LAR.

- Provide containment analysis for the main steam line break inside the containment. The analysis should account for any change in the closing time of the main steam isolation valve due to a new actuator.
- Provide the results of the revised main steam line break analysis outside the containment or justify that it is bounded by the current analysis.
- Justify the assertion that there is no change in the reactor response during a design basis loss-of-coolant accident (LOCA), main steam line break inside the containment, and SG tube rupture.

- Provide technical details on reasons for the heat load increase, reasons for adding electrical panels, and discuss how much margin is available in the Heating, Ventilation, and Air-Conditioning (HVAC) system.

Public Questions to NRC

There were no members of the public in attendance.

Closing

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 11:07 am (Eastern time).

Please direct any inquiries to me at 301-415-3100 or John.Lamb@nrc.gov.

/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
AUGUST 25, 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

ATTENDEE	**REPRESENTING**
John G. Lamb	U.S. Nuclear Regulatory Commission (NRC)
Nate Jordan	NRC
Steve Jones	NRC
Brian Wittick	NRC
Bob Pascarelli	NRC
Milton Valentin	NRC
Mark Blumberg	NRC
Todd Hilsmeier	NRC
Joshua Wilson	NRC
Shilp Vasavada	NRC
Ahsan Salman	NRC
Scott Krepel	NRC
Ken Lowery	Southern Nuclear Operating Company (SNC)
Ryan Joyce	SNC
Cheryl Gayheart	SNC
Lyndon Baines	SNC
Jerimiah Gilbreath	SNC
Matthew Horn	SNC
Kyle Shelton	SNC
William Howell	SNC
Corey Martin	SNC
Faramarz Pournia	SNC
Keith Drudy	SNC
Michael Coker	SNC
Pat Furio	Enercon – SNC Contractor
Nathan Raines	Enercon

SUBJECT: SUMMARY OF AUGUST 25, 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-0084) DATED SEPTEMBER 10, 2021

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ADAMS Accession No. PKG ML21230A287
Meeting Notice ML21224A202
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NAME	JLamb	KGoldstein	NJordan	MMarkley	JLamb
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