UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

February 7, 2022

Ms. Cheryl A. Gayheart
Regulatory Affairs Director
Southern Nuclear Company, Inc.
3535 Colonnade Parkway
Birmingham, AL 35243

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNITS 1&2 – INTEGRATED INSPECTION REPORT 05000424/2021004 AND 05000425/2021004

Dear Ms. Gayheart:

On November 30, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Vogtle Electric Generating Plant, Units 1&2. On January 19, 2022, the NRC inspectors discussed the results of this inspection with Mr. Drayton Pitts and other members of your staff. The results of this inspection are documented in the enclosed report.

One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violation or the significance or severity of the violation documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC Resident Inspector at Vogtle Electric Generating Plant, Units 1&2.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC Resident Inspector at Vogtle Electric Generating Plant, Units 1&2.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

Alan J. Blamey

Digitally signed by Alan J. Blamey
Date: 2022.02.07 06:18:48 -05'00'

Alan J. Blamey, Chief
Reactor Projects Branch 2
Division of Reactor Projects

Docket Nos. 05000424 and 05000425
License Nos. NPF-68 and NPF-81

Enclosure:
As stated

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers:	05000424 and 05000425
License Numbers:	NPF-68 and NPF-81
Report Numbers:	05000424/2021004 and 05000425/2021004
Enterprise Identifier:	I-2021-004-0016
Licensee:	Southern Nuclear Company, Inc.
Facility:	Vogtle Electric Generating Plant, Units 1&2
Location:	Waynesboro, GA
Inspection Dates:	October 01, 2021 to December 31, 2021
Inspectors:	B. Caballero, Senior Operations Engineer D. Mas-Penaranda, Project Engineer T. Morrissey, Senior Construction Inspector C. Safouri, Senior Resident Inspector R. Smith, Senior Resident Inspector M. Toth, Senior Project Engineer
Approved By:	Alan J. Blamey, Chief Reactor Projects Branch 2 Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Vogtle Electric Generating Plant, Units 1&2, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information.

List of Findings and Violations

Failure to Follow Procedures Results in Unit 1 Train A Safety Injection Pump Inoperability			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000424,05000425/2021004-02 Open/Closed	[H.3] - Change Management	71111.12
A self-revealed Green finding and associated Non-cited Violation (NCV) of 10 Code of Federal Regulations (CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and Technical Specification (TS) 3.5.2, Condition A, when the licensee failed to perform activities affecting quality in accordance with an approved procedure appropriate for the circumstance and operated in a condition prohibited by TS. Specifically, the licensee performed lubrication sampling of the Unit 1 train A safety injection (1A SI) pump while the pump was running, which did not follow NMP-ES-074-006, section 2.1, which states, "DO NOT use drop tube method to collect oil sample from a GEARBOX that is in operation/running," and ultimately resulted in the inoperability of the system from September 6, 2021, to September 29, 2021.			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
URI	05000424,05000425/2021004-01	SI Pump Room Unsealed Penetrations During Internal Flooding.	71111.06	Open
LER	05000424/2021001-00	LER 2021-001-00 for Vogtle Electric Generating Plant, Unit 1, Train A Safety Injection Pump inoperability causes the unit to operate in a Condition Prohibited by Technical Specifications	71111.12	Closed
LER	05000425/2020-001-00	LER 2020-001-00 for Vogtle Electric Generating Plant Unit 2, Transformer failure leads to main generator trip and subsequent reactor trip	71153	Closed

PLANT STATUS

Unit 1 began the inspection period in Mode 5 as part of the refueling outage (1R23) and returned to rated thermal power on October 10, 2021. On December 15, 2021, the unit down powered to 85 percent due to a condenser sodium excursion. The unit was returned to rated thermal power on December 20, 2021, and remained at or near rated thermal power for the remainder of the inspection period.

Unit 2 began the inspection period at rated thermal power. On November 18, 2021, the unit was down powered to 92 percent to perform main turbine valves stroke test. The unit was returned to rated thermal power on November 19, 2021, and remained at or near rated thermal power for the remainder of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed activities described in IMC 2515, Appendix D, "Plant Status," conducted routine reviews using IP 71152, "Problem Identification and Resolution," observed risk significant activities, and completed on-site portions of IPs. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Seasonal Extreme Weather Sample (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of seasonal cold temperatures for the following systems:

auxiliary feedwater system (AFW)
nuclear service cooling water (NSCW) system

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (1 Sample)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

(1) Unit 2 train B NSCW system due to train B NSCW pump 6 out of service for planned maintenance, on November 2, 2021

Complete Walkdown Sample (IP Section 03.02) (1 Sample)

(1) The inspectors evaluated system configurations during a complete walkdown of the Unit 2 train A and train B component cooling water (CCW) system, on November 6, 2021

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (2 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

(1) Fire Zones 140A/B/C/E, Unit 1 containment building, on October 4, 2021
(2) Fire Zones 4/5/9/10, Unit 2 containment spray and residual heat removal pump rooms, on November 7, 2021

71111.06 - Flood Protection Measures

Inspection Activities - Internal Flooding (IP Section 03.01) (2 Samples)

The inspectors evaluated internal flooding mitigation protections in the:

(1) Unit 1 train B safety injection (SI) pump room, on December 14, 2021
(2) Unit 1 train A and train B centrifugal charging pump rooms, on December 20, 2021

71111.07A - Heat Sink Performance

Annual Review (IP Section 03.01) (1 Sample)

The inspectors evaluated readiness and performance of:

(1) Unit 2 train A CCW heat exchanger, on October 19, 2021

71111.11A - Licensed Operator Requalification Program and Licensed Operator Performance

Requalification Examination Results (IP Section 03.03) (1 Sample)

(1) On October 22, 2021, the licensee completed the annual requalification operating tests required to be administered to all licensed operators in accordance with Title 10 of the *Code of Federal Regulations* 55.59(a)(2), "Requalification Requirements," of the NRC's "Operator's Licenses." During the week of November 29, 2021, the inspector performed an in-office review of the overall pass/fail results of the individual and crew operating tests in accordance with Inspection Procedure (IP) 71111.11, "Licensed Operator Requalification Program." These results were compared to the thresholds established in Section 3.02, "Requalification Examination Results of IP 71111.11.

The inspectors reviewed and evaluated the licensed operator failure rates for the

requalification annual tests, which the licensee completed administering on October 22, 2021.

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

(1) The inspectors observed and evaluated licensed operator performance in the control room during Mode 3 heatup and subsequent mode transitions following the refueling outage (1R23), on October 5, 2021

Licensed Operator Requalification Training/Examinations (IP Section 03.02) (1 Sample)

(1) The inspectors observed and evaluated simulator training on the execution of prompt operator actions, loss of instrument air event, and security event, on November 2, 2021

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (3 Samples)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:

(1) Lubrication sampling practices of SI pumps following Unit 1 train A SI pump failure, on September 16, 2021
(2) Unit 1 train B emergency diesel generator unavailability performance criterion exceeded, on October 18, 2021
(3) Unit 2 turbine plant sampling valve, 2-HV-9453, a(1) retraction evaluation, on October 27, 2021

Quality Control (IP Section 03.02) (1 Sample)

The inspectors evaluated the effectiveness of maintenance and quality control activities to ensure the following SSC remains capable of performing its intended function:

(1) Unit 2 train A CCW pump #1 following outboard bearing replacement with commercial grade dedication parts, on August 24, 2021

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (1 Sample)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

(1) Unit 1 train A SI pump lube oil starvation failure and extent of condition investigation, on September 16, 2021

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (2 Samples)

The inspectors evaluated the following post-maintenance test activities to verify system operability and functionality:

(1) Unit 1 train A SI pump repair following lube oil starvation failure, on September 16, 2021
(2) Unit 1 train B SI motor cooler NSCW strainer modification, on November 30, 2021

71111.20 - Refueling and Other Outage Activities

Refueling/Other Outage Sample (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated refueling outage 1R23 from October 1, 2021, to October 7, 2021. The inspectors completed inspection procedure Sections 03.01.d through 03.01.e.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (2 Samples)

(1) 14721D-1, emergency core cooling system (ECCS) subsystem flow balance and checkvalve refueling inservice test, on August 15, 2021
(2) 14666-1, Train A diesel generator and engineered safety features actuation system (ESFAS) test, on September 25, 2021

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (2 Samples)

(1) Unit 1 (October 1, 2020 through September 30, 2021)
(2) Unit 2 (October 1, 2020 through September 30, 2021)

MS06: Emergency AC Power Systems (IP Section 02.05) (2 Samples)

(1) Unit 1 (October 1, 2020 through September 30, 2021)
(2) Unit 2 (October 1, 2020 through September 30, 2021)

MS10: Cooling Water Support Systems (IP Section 02.09) (2 Samples)

(1) Unit 1 (October 1, 2020 through September 30, 2021)
(2) Unit 2 (October 1, 2020 through September 30, 2021)

71152 - Problem Identification and Resolution (PI&R)

Semiannual Trend Review (IP Section 02.02) (1 Sample)

(1) The inspectors reviewed the licensee's corrective action program for potential adverse trends in Unit 1 train B CCW pump #2 oil level that might be indicative of a more significant safety issue.

Annual Follow-up of Selected Issues (IP Section 02.03) (2 Samples)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

(1) Part 21 associated with Barton differential pressure transmitters hydrostatic pressure testing, condition report (CR) 10824781.
(2) Unit 1 loop 1 accumulator tank leakage, CR 10801613.

71153 - Follow Up of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (2 Samples)

The inspectors evaluated the following licensee event reports (LERs):

(1) LER 05000425/2020-001-00, Transformer failure leads to main generator trip and subsequent reactor trip (ADAMS Accession No. ML21008A571): The inspectors determined that it was not reasonable to foresee or correct the cause discussed in the LER therefore no performance deficiency was identified. The inspectors did not identify a violation of NRC requirements.
(2) LER 05000424/2021-001-00, Unit 1 Train A Safety Injection Pump inoperability causes the unit to operate in a Condition Prohibited by Technical Specifications (ADAMS Accession No. ML21319A348): The inspection conclusions associated with this LER are documented in this report under Inspection Results Section 71111.12.

INSPECTION RESULTS

Unresolved Item (Open)	SI Pump Room Unsealed Penetrations During Internal Flooding URI 05000424,05000425/2021004-01	71111.06

Description: NRC inspectors are reviewing flood information related to an issue of concern associated with internal flood analyses for the safety injection (SI) pump rooms. During on-site walkdowns of the Unit 1 train B SI pump room on December 14, 2021, NRC inspectors identified an open wall penetration approximately 3-4" in diameter near the top of the room's watertight door, which was also below the maximum calculated flood height of 135 inches (11.25') per Calculation X6CXC-30. By means of an extent of condition comparison, NRC inspectors and licensee staff identified additional open penetrations in the 1A, 2A, and 2B SI pump room walls. These additional open penetrations varied in both location and number for each pump room and can be summarized by the following:

- 1A SI pump room: 2 unsealed or inadequately rated for flood protection
  - 1-2108-Z1-1392-B and 1-2108-Z1-1572-B
- 2A SI pump room: 2 unsealed or inadequately rated for flood protection

- 2-2108-Z1-1488-B and 2-2108-Z1-1490-B
- 2B SI pump room: 5 unsealed or inadequately rated for flood protection
  - 2-2108-Z1-1080-B, 2-2108-Z1-1081-B, 2-2108-Z1-1082-B, 2-2108-Z1-0480-B, and 2-2108-Z1-0481-B

10 CFR Part 50, Appendix B, Criterion III, “Design Controls,” requires in part, that “design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program." Additionally, the Vogtle Electric Design Manual (VEGP) Design Control Number DC-1003, "Flooding-Interdiscipline," outlines internal flooding requirements including, in part, the following information:

- Watertight doors shall be used to prevent flooding of safety-related equipment if other simpler means are not feasible; e.g., curbed doorways. The flooding hazard shall be assessed by analysis per section 4.0 of this document. (Section 3.1.12)
- Penetrations through walls of safety-related rooms or areas should be designed to withstand the design flood levels on either side of the walls to prevent leakage through the penetration. Penetrations which do not increase flood levels on either side of walls, by means of communication, need not be sealed against water. (Section 3.1.16)

NRC inspectors identified that the original room drawings and approved internal flood calculations for the SI pump rooms did not include the unsealed penetrations or account for their impact during internal flooding scenarios. This unresolved item (URI) is being opened to determine whether the unsealed flood penetrations were the result of a more-than-minor licensee performance deficiency, and whether or not a regulatory requirement was violated.

Planned Closure Actions: NRC inspectors will review all applicable information related to the flood analyses associated with the on-site SI pump rooms to determine whether a performance deficiency exists. Additionally, NRC inspectors will coordinate these results with a Region II Senior Reactor Analyst to determine overall significance of the issue through the NRC's ROP.

Licensee Actions: Licensee staff have completed an initial assessment of the internal flood analyses for the SI pump rooms and determined the SI pumps remained operable with the identified open penetrations. Additionally, a work authorization was created and implemented to formally seal the penetration at the 17" level for the 2B SI pump room. The licensee is still evaluating the impact of the penetrations in the additional rooms.

Corrective Action References: Condition Report (CR) 10847097

Failure to Follow Procedures Results in Unit 1 Train A Safety Injection Pump Inoperability			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000424,05000425/2021004-02 Open/Closed	[H.3] - Change Management	71111.12
A self-revealed Green finding and associated Non-cited Violation (NCV) of 10 Code of Federal Regulations (CFR) Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” and Technical Specification (TS) 3.5.2, Condition A, when the licensee failed to			

perform activities affecting quality in accordance with an approved procedure appropriate for the circumstance and operated in a condition prohibited by TS. Specifically, the licensee performed lubrication sampling of the Unit 1 train A safety injection (1A SI) pump while the pump was running, which did not follow NMP-ES-074-006, section 2.1, which states, “DO NOT use drop tube method to collect oil sample from a GEARBOX that is in operation/running,” and ultimately resulted in the inoperability of the system from September 6, 2021, to September 29, 2021.

Description: On September 16, 2021, while Unit 1 was in Mode 6, the 1A SI pump was started while performing a surveillance 14721D-1, “ECCS Subsystem Flow Balance and Checkvalve Refueling Inservice Test.” Shortly after the 1A SI pump start, the system operator saw smoke emit from the pump outboard bearing and local temperature indicator for the bearing rise, and promptly secured the pump and the licensee subsequently declared it inoperable. Upon investigation and disassembly, the licensee discovered the worm gear, which drives the gear-driven lube oil pump, catastrophically damaged. The preliminary cause was attributed to a piece of foreign material (FM), a small piece of plastic, lodged between two gears which was assumed to have prevented or inhibited gear rotation, and subsequent failure of the worm gear which resulted in lube oil starvation (Condition Report (CR) 10828893). The licensee replaced several damaged parts (i.e., the wiped bearings) and performed a flush of the lube oil system.

On September 25, 2021, during post maintenance testing following repairs, a similar event occurred with bearing temperatures quickly increasing upon pump start followed by prompt securing of the pump. The worm gear was discovered to be catastrophically failed and the bearings were wiped. The licensee began troubleshooting a second time and discovered a small check valve within the lube oil system that the licensee was unaware of and was not on the piping and instrumentation diagrams (P&IDs), however was contained in the vendor manual. Upon disassembly of the check valve, which is located within a union in the lube oil piping, small pieces of FM (plastic), were discovered within the check valve (CR 10830377). This was believed to have resulted in lube oil starvation for the second 1A SI pump failure. Following repairs, the 1A SI pump was successfully restored back to operable on September 29, 2021.

The licensee performed an extent of condition investigation of the SI pumps for both units. On October 3, 2021, the 1B SI pump was tagged out and a few pieces of FM were found within the check valve (CR 10831851). On October 5, 2021, the 2B SI pump was tagged out and contained several pieces of small plastic FM, most of which were found in the oil recirculation piping leg just upstream of the lube oil pressure relief valve, with the remainder found upstream of the oil filter (CR 10733667). On October 7, 2021, the 2A SI pump was tagged out which contained a few pieces of plastic FM, all of which were found in the oil recirculation piping leg just upstream of the lube oil pressure relief valve (CR 10833295). The extent of condition investigation of all SI pumps was completed on October 8, 2021. Overall, the amount of FM found in 1B, 2A, and 2B SI lube oil system was less compared to 1A SI lube oil system.

The plastic FM is believed to have been introduced to the lube oil system during oil sampling. There is a nine-month preventative maintenance task to perform lube oil sampling on the SI pumps, where it is performed while the pump is running. The causal analysis conducted under corrective action report (CAR) 282464 concluded that the FM likely originated from the plastic sampling tube, used during oil sampling, inappropriately being sampled from the gearbox while the pumps were running. The duration of FM existing within the SI pump lube system is unknown.

Additionally, during the extent of condition, the licensee discovered that the 2A and 2B SI pumps both did not contain any check valve (CR 10833295 and CR 10832538). The licensee conducted a detailed search of the corrective action program, work orders, and other documentation to determine when or if the check valve was removed. No documented history was found, and it is unknown when the check valve was removed or for how long the 2A and 2B SI pumps have been operated with no check valve installed in the lube oil pump discharge piping. Vogtle engineering, with support of the vendor, determined that the function of the check valve was to maintain the oil supply piping filled with oil so that when an SI pump is started, the delay in providing adequate lubrication to the bearings is reduced. The issue was characterized as a long-term degradation issue where a slight amount of wear is incurred during each pump start, and the licensee returned the 2A and 2B SI pumps back to operable upon completion of lube oil flush.

The 1A SI pump was last run during an inservice test (IST) on September 6, 2021, for approximately 1 hour. An oil sample was taken during this run and analyzed to be acceptable. The 1B SI pump was last run during an IST on August 30, 2021, for approximately 50 minutes. An oil sample was taken during this run and analyzed to be acceptable. Additionally, due to an unrelated issue surrounding accumulator leakage, the 1A and 1B SI pumps were run frequently (in an alternating manner) for a total of 7 hours during the months of June through July for periods of approximately 5-10 minutes. Moreover, during the Unit 1 refueling outage, the 1B SI pump was ran 6 times for a total of 2.65 hours. Lastly, the licensee entered a refueling outage and exited the mode of applicability for SI pump operability on September 12, 2021.

The 2A SI pump was last run during an IST on August 12, 2021, for approximately 20 minutes. An oil sample was taken during this run and analyzed to be acceptable. The 2B SI pump was last run during an IST on August 25, 2021, for approximately 15 minutes. An oil sample was taken during this run and analyzed to be acceptable.

Corrective Actions: The 1A SI pump was repaired, lube oil system was flushed, and returned to service; an extent of condition investigation was performed on all SI pumps on both units; and an interim standing order was put in place to not sample pumps while running until industry benchmarking and subsequent specific guidance has been provided.

Corrective Action References: CAR 282464

Performance Assessment:

Performance Deficiency: Fleet Procedure NMP-ES-074-006, “Fleet Lubrication Instruction,” Version 4.0, states under Section 2.1, Precautions, the following: “DO NOT use drop tube method to collect oil sample from a GEARBOX that is in operation/running. Doing so could cause drop tube to be pulled into the GEARBOX from the vampire pump.” During oil sampling, the licensee inserted a sampling tube into the lube oil gearbox associated with the SI pumps while the pumps were running, which resulted in FM being introduced to the lube oil system and ultimately, the lube oil starvation of the pump outboard bearing resulted in pump failure.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the

availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The performance deficiency did require a detailed risk evaluation because the degraded condition represented a loss of the probabilistic risk assessment function of one train of a multi-train TS system for greater than its TS allowed outage time. The total time the 1A SI pump was determined to be inoperable under applicable modes was 137 hours, which is beyond the TS 3.5.2, Condition A, completion time of 72 hours; TS 3.5.2, Condition B, states if the required action and associated completion time was not met, the unit is required to be in Mode 3 within 6 hours and Mode 4 within 12 hours.

A detailed risk evaluation was performed by a regional senior reactor analyst using SAPHIRE Version 8.2.5 and NRC Vogtle SPAR model Version 8.60. The conditional analysis included a Bayesian update to the failure likelihood of the SI pumps for both Units 1 and 2 with a one-year exposure time. In addition, the conditional risk associated with the failure of the 1A SI pump was also included. No credit was provided in the analysis for recovery of a failed SI pump. The dominant sequence was a Medium Loss of Coolant Accident initiating event accompanied by a failure of the high-pressure injection and cooldown mitigating functions accompanied by the maintenance unavailability of the B-train of safety-related cooling water. The analysis determined that the estimated increase in Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) was less than 1E-06/year for delta-CDF and less than 1E-07/year for delta-LERF, representing a finding of very low safety significance (Green) for both Units 1 and 2.

Cross-Cutting Aspect: H.3 - Change Management: Leaders use a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority.

Enforcement:

Violation: 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states in part that "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

Vogtle, Units 1 and 2, Technical Specification (TS) 3.5.2, "Emergency Core Cooling Systems (ECCS)," requires two ECCS trains shall be operable in Modes 1 through 3; if a train is inoperable, it shall be returned to operable status within 72 hours or in accordance with the Risk Informed Completion Time Program, otherwise the unit shall be shut down and in Mode 3 within 6 hours and Mode 4 within 12 hours.

Contrary to the above, sometime between August 22, 2013 (estimated) and September 6, 2021, the licensee failed to accomplish activities affecting quality in accordance with procedures for lubrication sampling of the SI pumps, which rendered the 1A SI pump inoperable under applicable modes for 137 hours, which is greater than the TS allowed outage time, and the unit had not been placed in Mode 3 and Mode 4 within the required times.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On January 19, 2022, the inspectors presented the integrated inspection results to Mr. Drayton Pitts and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Corrective Action Documents	Condition Reports	10836230, 10837239	
	Corrective Action Documents Resulting from Inspection	Condition Reports	10848171	
	Miscellaneous	NMP-GM-025	Site Certification for Winter Readiness	11/15/2021
	Procedures	11901-1	Heat Tracing System Alignment	10/18/2021
		11901-2	Heat Tracing System Alignment	10/17/2021
		17104-1	ARP for Heat Tracing Panel 1NCQARHT	18.1
		17104-2	ARP for Heat Tracing Panel 2NCQARHT	18.0
		NMP-GM-025	Seasonal Readiness Process	8.0
71111.04	Corrective Action Documents Resulting from Inspection	Condition Reports	10839617, 10839691, 10839744, 10839750, 10839751, 10839785	
	Drawings	2X4DB135-2	P & I Diagram Nuclear Service Water System, System Number 1202	29.0
		2X4DB136	P&I Diagram - Component Cooling Water System - System No. 1203	24.0
		2X4DB137	P&I Diagram - Component Cooling Water System - System No. 1203	21.0
		2X4DB149-1	Flow Diagram - Cooling Water System - Systems 1202, 1203, 1217	5.0
		2X4DB149-2	Flow Diagram - Cooling Water System - Systems 1202, 1203, and 1217	4.0
	Miscellaneous	1X4AF01-00136	Instruction Manual Component Cooling Water and Auxiliary Component Cooling Water	35.0
	Procedures	11715-2	Component Cooling Water System Alignment	12.1
		13150B-2	Train B Nuclear Service Cooling Water System	16
71111.05	Corrective Action Documents	Condition Reports	10842398	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Resulting from Inspection			
	Procedures	92704-2	Zone 4 - Auxiliary Building - Level D, Containment Spray Pump "A" Fire Fighting Preplan	2.0
		92705-2	Zone 5 - Auxiliary Building - Level D, Containment Spray Pump "B" Fire Fighting Preplan	3.0
		92709-2	Zone 9 - Auxiliary Building - Level D Fire Fighting Preplan	2.2
		92710-2	Zone 10 - Auxiliary Building Level D Fire Fighting Preplan	2.2
		92840A-1	Zone 140A - Containment Building - Levels A, B, 1, and 3 East Fire Fighting Preplan	4.1
		92840B-1	Zone 140B - Containment Building - Levels A, B, 1, 2, and 3 Fire Fighting Preplan	5.1
		92840C-1	Zone 140C - Containment Building - Levels A, B, 1 and 3 Steam Generator Compartment Fire Fighting Preplan	4.1
		92840E-1	Zone 140E - Containment Building - Levels A, 1 and 2 Fire Fighting Preplan	1.1
71111.06	Calculations	X6CXC-30	Flooding Analysis Auxiliary Building	07/19/1993
	Corrective Action Documents Resulting from Inspection	Condition Reports	10846893, 10849573, 10852053	
	Miscellaneous	REA 97-VAA632	Door Database	06/30/1998
		REA 99-VAA650	Door Database Update	09/03/1999
		VEGP Design Manual, Design Control Number DC-1003	Flooding - Interdiscipline	11.0
		X6CXC-26	Flooding Analysis Auxiliary Building Level C	9
71111.07A	Corrective Action Documents	Condition Reports	10423905, 10836215, 10837460	
	Corrective Action Documents Resulting from Inspection	Condition Reports	10845900	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Miscellaneous		2A CCW HX Fluid Temperatures, 11/7-11/12/2021	
		AX4AE01-00109	Instruction Manual for CCW and ACCW Heat Exchangers	7.0
		ELV-1212	VEGP Response to Generic Letter 89-13 Service Water System Problems Affecting Safety-Related Equipment	01/25/1990
		EPRI 1022980	Guidance for an Effective Heat Exchanger Program	09/2011
	NDE Reports		2A CCW HX Post-Plugging Map 11-2021 from ECT Report	
			2A CCW Heat Exchanger ECT Report	10/19/2021
		2X4DR024-019	2A CCW HX Pre-Plugging Map 2021	1
	Procedures	30025-C	Periodic Analysis Scheduling Program	100
		35363-C	Chemistry Control of the NSCW System	9.3
		38363-2	Chemical Addition to the Unit Two NSCW	12.0
		83305-C	Heat Exchanger Testing/Maintenance Program	7.11
		83306-C	CCW and ACCW Heat Exchanger Testing	8
		83306-C	CCW and ACCW Heat Exchanger Testing	11.1
		NMP-ES-012-GL05	Heat Exchanger Program Eddy Current Testing (ECT) Strategic Plan for Plant Vogtle	1.0
		NMP-ES-024-701	Eddy Current Testing of Heat Exchanger Tubing	5.0
	Work Orders		SNC814889, SNC336301, SNC910488	
71111.11Q	Miscellaneous	V-RQ-SG-21602 18028 18037	Lesson Plan Form	10/14/2021
	Procedures	12003-1	Reactor Startup (Mode 3 to Mode 2)	5
		12004-1	Power Operation (Mode 1)	8.0
71111.12	Corrective Action Documents	Condition Reports	10828893, 10829924, 10829977, 10829979, 10830062, 10830377, 10830403, 10830550, 10831851, 10832538, 10832610, 10833213, 10833295, 10833439, 10798047, 10819690, 10827428, 10832569	
		Corrective Action Reports	282464	
		Technical Evaluations	1088188	
	Corrective Action Documents Resulting from Inspection	Condition Reports	10834273	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Miscellaneous		Oil Analysis - Unit 2 CCW #1	08/11/2021
			Temperature Trace for 2A CCW Pumps 1 and 3, Inboard and Outboard Bearings	09/15/2021
		1X6AG02-00016	Instruction Manual for Pacific Pumps Safety Injection Pumps	13.0
		2- LCO-21-00050	2A CCW Pump 1 INOP Due to Damaged Outboard Bearing	
		2-LCO-21-00056	2A CCW Pump 1 INOP Due to Damaged Outboard Bearing	
		MREP20210713	Maintenance Rule Expert Panel Meeting #2021-0713	
		PO# SNG10091953	Warehouse Receipt / Stock Process Sheet	12/11/2014
		SCM-CGDP-042	Farley, Hatch and Vogtle Nuclear Plants Commercial Grade Dedication Plan (Bearing)	27.0
	Procedures	14803A-2	Train A CCW Pumps and Check Valve IST and Response	08/20/2021
		14803A-2	Train A CCW Pumps and Check Valve IST and Response	10/09/2021
		27112-C	Safety Injection Pump Maintenance	10
		NMP-DP-001	Operational Risk Awareness	20.0
		NMP-ES-027	Maintenance Rule Program	10.4
		NMP-ES-074-006	Fleet Lubrication Instruction	4.0
		NMP-MA-009	Foreign Material Exclusion Program	16.2
		NMP-MA-009-001	Foreign Material Exclusion Program Requirements	11.1
		SCM-ENG-006	Accepting Commercial Grade Items for Use as Basic Components	8.2
	Work Orders		SNC1178604, SNC1180555, SNC1172499	
71111.15	Corrective Action Documents	Condition Reports	10828893, 10829924, 10829977, 10829979, 10830062, 10830377, 10830403, 10830550, 10831451, 10831851, 10832538, 10832610, 10833213, 10833295, 10833439, 10834273	
		Corrective Action Reports	282464	
		Technical Evaluations	1093808, 1094635, 1094975, 1094811	
	Corrective Action Documents Resulting from Inspection	Condition Reports	10831451, 10834273	
		Technical Evaluations	1098071	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Miscellaneous	1380-0046-RPT-001	Past Operability Review of Vogtle Unit 1 Safety Injection Pumps	0
		1380-0046-RPT-002	Past Operability Review of Vogtle Unit 2 Safety Injection Pumps	0
		1X6AG02-00016	Instruction Manual for Pacific Pumps Safety Injection Pumps	13.0
	Procedures	20412-C	General Oil Sample Collection	5.2
		NMP-ES-074-006	Fleet Lubrication Instruction	4.0
71111.19	Corrective Action Documents Resulting from Inspection	Condition Reports	10847606	
	Miscellaneous	1X6AG02-00016	Instruction Manual for Pacific Pumps Safety Injection Pumps	13.0
	Procedures	27112-C	Safety Injection Pump Maintenance	10
		83308-C	Testing of Safety-Related NSCW System Coolers	33.3
	Work Orders		SNC1178604, SNC1180555, SNC1149001, SNC1148998	
71111.20	Corrective Action Documents	Condition Reports	10830844	
	Miscellaneous		PQS Schedule Report for Maintenance and Operations for 9/21 - 10/21	
		NMP-AD-016-001-F02	Fatigue Rule Waiver	09/28/2021
71111.22	Procedures	14666-1	Train A Diesel Generator and ESFAS Test	41.3
		14721D-1	ECCS Subsystem Flow Balance and Checkvalve Refueling Inservice Test	2
71152	Corrective Action Documents	Condition Reports	10824781, 10819677, 10772686, 10789625, 10804971, 10805260, 10817917, 10826474, 10801613	
		Corrective Action Reports	279673, 279719	
	Work Orders		SNC1165581, SNC1171219, SNC859606	
71153	Corrective Action Documents	Condition Reports	10753578, 10753583, 10753588, 10753592, 10753938, 10754009, 10754020, 10754032, 10754037, 10754061, 10754064, 10754065, 10754320, 10754321, 10754600, 10754640, 10754658	
		Corrective Action	278594	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		Reports		
	Corrective Action Documents Resulting from Inspection	Condition Reports	10846606	
	Miscellaneous		2A/2B/2C Generator Step-Up Transformer Dissolved Gas Analysis Data	
		2-20-001	Event Recovery Report: Unit 2 Reactor Trip due to Generator Step-Up (GSU) transformer 'B' Failure	11/12/2020
	Work Orders		SNC1129023	