



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

May 7, 2021

Mr. G. T. Powell
President and CEO
STP Nuclear Operating Company
P.O. Box 289
Wadsworth, TX 77483

SUBJECT: SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION, UNITS 1
AND 2 – INTEGRATED INSPECTION REPORT 05000498/2021001
AND 05000499/2021001

Dear Mr. Powell:

On March 31, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at South Texas Project Electric Generating Station, Units 1 and 2. On April 22, 2021, the NRC inspectors discussed the results of this inspection with you 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 and was determined to be Severity Level IV. One Severity Level IV violation without an associated finding is documented in this report. We are treating these violations as Non-Cited Violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

Additionally, in the preceding six months the NRC issued three Severity Level IV traditional enforcement violations associated with impeding the regulatory process, as described in NRC Inspection Report 05000498,05000499/2020004, dated January 26, 2021, and in this report. While the NRC did note that the identified issues appear to show a gap in the stations process for determining whether prior NRC approval was required for changes being made, the NRC determined that the examples were dated and not representative of current plant performance. Based on this the NRC is not currently planning to perform Inspection Procedure 92723, "Follow up Inspection for Three or More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12-Month Period."

If you contest the violations or the significance or severity of the violations 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 IV; the Director, Office of Enforcement; and the NRC Resident Inspector at South Texas Project Electric Generating Station, Units 1 and 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 IV; and the NRC Resident Inspector at South Texas Project Electric Generating Station, Units 1 and 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,

/RA/

Jeffrey E. Josey, Chief
Reactor Projects Branch A
Division of Reactor Projects

Docket Nos. 05000498 and 05000499
License Nos. NPF-76 and NPF-80

Enclosure:
As stated

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SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION, UNITS 1 AND 2 –
 INTEGRATED INSPECTION REPORT 05000498/2021001 AND 05000499/2021001 –
 DATED MAY 7, 2021

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000498 and 05000499

License Numbers: NPF-76 and NPF-80

Report Numbers: 05000498/2021001 and 05000499/2021001

Enterprise Identifier: I-2021-001-0002

Licensee: STP Nuclear Operating Company

Facility: South Texas Project Electric Generating Station, Units 1 and 2

Location: Wadsworth, TX

Inspection Dates: January 1, 2021 to March 31, 2021

Inspectors: G. Kolcum, Senior Resident Inspector
C. Stott, Resident Inspector

Approved By: Jeffrey E. Josey, Chief
Reactor Projects Branch A
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 South Texas Project Electric Generating Station, Units 1 and 2, in accordance with the Reactor Oversight Process (ROP). 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 Update the Updated Final Safety Analysis Report			
Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Severity Level IV NCV 05000498,05000499/2021001-01 Open/Closed	Not Applicable	71111.06
The inspectors identified a Severity Level IV Non-Cited Violation (NCV) of 10 CFR Part 50.71(e), “Maintenance of Records,” for the licensee’s failure to update the Updated Final Safety Analysis Report (UFSAR). Specifically, the licensee failed to update sections of the UFSAR to reflect operator actions required for continued operation of the essential cooling water system (ECWS) during a design basis accident (DBA).			

Failure to Receive Commission Approval for Changes to Mitigate Internal Flooding of Essential Cooling Water Intake Structure			
Cornerstone	Significance/Severity	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green Severity Level IV NCV 05000498,05000499/2021001-02 Open/Closed	[H.13] - Consistent Process	71111.06
The inspectors identified a Green finding and associated Non-Cited Violation of 10 CFR Part 50 Appendix B, Criterion III, “Design Control,” and with an associated Severity Level IV violation of 10 CFR Part 50.59(c)(2)(ii), “Changes, Tests and Experiments,” for the licensee’s failure to verify the adequacy of the design of the essential cooling water intake structure (ECWIS) with respect to internal flooding. Specifically, the licensee failed to adequately account for the effects of leakage allowed in the ECWIS pump bays. The licensee also failed to receive Commission approval for the establishment of an administrative limit for allowed leakage that resulted in more than a minimal increase in the likelihood of occurrence of a malfunction of the ECWS.			

Additional Tracking Items

None.

PLANT STATUS

Unit 1 began the inspection period at rated thermal power and on February 15, 2021 tripped on loss of main feedwater during cold weather. Unit 1 returned to full power on February 18, 2021.

Unit 2 began the inspection period at rated thermal power and commenced a reactor shutdown on March 19, 2021, to begin refueling outage 2RE21 and remained in refueling outage 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 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.

Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the Coronavirus Disease 2019 (COVID-19), resident inspectors were directed to begin telework and to remotely access licensee information using available technology. During this time, the resident inspectors performed periodic site visits each week; conducted plant status activities as described in IMC 2515, Appendix D, "Plant Status"; observed risk-significant activities; and completed on-site portions of IPs. In addition, resident and regional baseline inspections were evaluated to determine if all or portions of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on-site. The inspections documented below met the objectives and requirements for completion of the IP.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Impending Severe Weather Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the adequacy of the overall preparations to protect risk -significant systems from impending severe weather ice storm on February 14, 2021.

External Flooding Sample (IP Section 03.03) (1 Sample)

- (1) The inspectors evaluated that flood protection barriers, mitigation plans, procedures, and equipment are consistent with the licensee's design requirements and risk analysis assumptions for coping with external flooding in the Units 1 and 2 ECWIS.

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (5 Samples)

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

- (1) Unit 2, train A containment spray system on January 12, 2021
- (2) Unit 1, train B auxiliary feedwater on February 16, 2021
- (3) Unit 1, trains A, B, and C essential cooling water screen wash on February 19, 2021
- (4) Unit 1, trains A, B, and C essential cooling water motor control center on February 26, 2021
- (5) Unit 1, trains A, B, and C essential cooling water strainer on February 9, 2021

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

- (1) The inspectors evaluated system configurations during a complete walkdown of the Unit 1 essential cooling water pumphouse the week of February 1, 2021.

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (5 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) Unit 2, train B essential cooling water intake structure pump room on January 11, 2021
- (2) Unit 2, train B emergency diesel generator on January 12, 2021
- (3) Unit 2, train C component cooling water and essential chiller room on February 24, 2021
- (4) Fire pumphouse on February 25, 2021
- (5) Unit 2, containment on March 22, 2021

71111.06 - Flood Protection Measures

Inspection Activities - Internal Flooding (IP Section 03.01) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

- (1) Units 1 and 2, essential cooling water system intake structure

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 Unit 1 trip on February 15, 2021.

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

- (1) The inspectors observed and evaluated an operations crew respond to a degraded condition that resulted in a site area emergency on February 3, 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) Unit 1, electrical auxiliary building air supply/exhaust fan damper circuit
- (2) Units 1 and 2, essential cooling water seals on March 22, 2021
- (3) Units 1 and 2, essential cooling water strainer/traveling screens on March 23, 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) Units 1 and 2, essential cooling water pump seals on March 22, 2021

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

- (1) Unit 2, train B containment spray when maintenance personnel went into the wrong cabinet (for Unit 2, train B component cooling water) on January 12, 2021
- (2) Unit 2, yellow risk for work on train C essential cooling water aluminum bronze piping replacement during the week of February 21, 2021
- (3) Unit 1, unplanned risk due to qualified display parameter system A2 communications card failure on February 22, 2021

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (5 Samples)

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

- (1) Unit 1, train B essential cooling water pipes with two possible through-wall leaks around the component cooling water heat exchanger on January 3, 2021
- (2) Unit 2, train C engineering safety features actuation system after failure of test circuit power source on January 23, 2021

- (3) Unit 2, train A emergency diesel generator crack found on exhaust bellows on January 29, 2021
- (4) Unit 1, auxiliary feedwater storage tank level on February 15, 2021
- (5) Units 1 and 2, ECWIS due to internal flooding from normal operations on March 16, 2021

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Unit 1, steam generator feed pump net positive suction high pump trip modification on February 18, 2021

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (6 Samples)

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

- (1) Unit 2, train B auxiliary feedwater pump maintenance on January 11, 2021
- (2) Unit 2, train B residual heat removal system maintenance on January 14, 2021
- (3) Unit 2, train B control room envelope damper maintenance on January 15, 2021
- (4) Unit 2, train A essential cooling water system maintenance on February 1, 2021
- (5) Unit 2, train A emergency diesel generator maintenance on February 4, 2021
- (6) Unit 1, train C FLEX [Diverse and Flexible Coping Strategies] reactor coolant system makeup pump on March 8, 2021

71111.20 - Refueling and Other Outage Activities

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

- (1) (Partial)
The inspectors evaluated Unit 2 refueling outage activities that began on March 19, 2021.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (7 Samples)

- (1) Unit 1, train A residual heat removal system valve operability test on January 1, 2021
- (2) Unit 1, train B residual heat removal system valve operability test on January 1, 2021
- (3) Unit 2, containment spray valve checklist on January 1, 2021
- (4) Unit 2, emergency core cooling system valve checklist on January 1, 2021
- (5) Unit 1, train B emergency diesel generator on January 12, 2021
- (6) Unit 2, train B emergency diesel generator on January 13, 2021

- (7) Unit 1, surveillance for start up to test turbine throttle valve for mode 1 restraint on February 16, 2021

Inservice Testing (IP Section 03.01) (1 Sample)

- (1) Unit 2, train B emergency core cooling system pumps testing on January 12, 2021

Containment Isolation Valve Testing (IP Section 03.01) (1 Sample)

- (1) Unit 1, local leak rate testing of M-69 penetration for spent fuel pool on March 9, 2021

FLEX Testing (IP Section 03.02) (1 Sample)

- (1) FLEX diesel generator 21 run on March 7, 2021

71114.06 - Drill Evaluation

Drill/Training Evolution Observation (IP Section 03.02) (2 Samples)

The inspectors evaluated:

- (1) licensed operator training evolution that involved a reactor coolant leak, loss of emergency bus, and loss of reactor coolant accident which exercised emergency classification levels on February 17, 2021
- (2) licensed operator training evolution that involved a steam generator tube leak, reactor coolant leak, and Alert notification on March 9, 2021

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 03.01) (2 Samples)

- (1) Unit 1 (January 2020, through December 2020)
- (2) Unit 2 (January 2020, through December 2020)

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 03.02) (2 Samples)

- (1) Unit 1 (January 2020, through December 2020)
- (2) Unit 2 (January 2020, through December 2020)

IE04: Unplanned Scrams with Complications Sample (IP Section 03.03) (2 Samples)

- (1) Unit 1 (January 2020, through December 2020)
- (2) Unit 2 (January 2020, through December 2020)

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (IP Section 02.03) (1 Sample)

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

- (1) Units 1 and 2, ECWIS due to internal flooding from normal operations on March 30, 2021

INSPECTION RESULTS

Failure to Update the UFSAR			
Cornerstone	Severity	Cross-Cutting Aspect	Report Section
Not Applicable	Severity Level IV NCV 05000498,05000499/2021001-01 Open/Closed	Not Applicable	71111.06
<p>The inspectors identified a Severity Level IV Non-Cited Violation of 10 CFR Part 50.71(e), “Maintenance of Records,” for the licensee’s failure to update the UFSAR. Specifically, the licensee failed to update sections of the UFSAR to reflect operator actions required for continued operation of the ECWS during a DBA.</p>			
<p><u>Description:</u> UFSAR section 1.1.1 states, “The Updated Final Safety Analysis Report is submitted as a unique document in compliance with Regulatory Guide (RG) 1.70, ‘Standard Format and Content of Safety Analysis Reports,’ Revision 2 and 10 CFR 50.71(e).” Regulatory Guide 1.70, section 9.2.1, “Station Service Water System,” states that the licensee should “describe ... requirements for normal operation and for operating during and subsequent to postulated accident conditions, including loss of offsite power.” UFSAR section 9.2.1.2.1 describes the design basis of the operation of the ECWS, and states, in part, “The ECWS is designed to ... perform its cooling function following a DBA with either offsite or onsite power available, automatically and without operator action, assuming a single failure.”</p> <p>The inspectors found that the licensee relies on operator actions required for continued operation of the ECWS during DBA scenarios. Specifically, UFSAR Appendix 9A states, “The maximum flooding rate in the essential cooling water intake structure (ECWIS) should be limited to 2.3 gpm, based on allowing 7 days operation before providing temporary drainage.” The phrase “providing temporary drainage” means that operators would be required to pump water out of the ECWIS. This is based on discussions with the licensee since there were not any procedures that the inspectors could reference for providing temporary drainage to the ECWIS. In addition, calculations did not support the claim that the ECWS can operate for seven days with a flooding rate of 2.3 gpm, which equates to 138 gph. At that rate, safety-related equipment would be partially submerged that was never qualified to operate in submerged conditions, including a 480vac motor control center.</p> <p>The operator actions to provide temporary drainage to the ECWIS are also not accounted for in UFSAR chapter 15 for accident analysis. Section 15.0.8.3, “Operator Actions Assumed in Accident Analysis,” states, “If required, manual actions depend on the available safety and non-safety systems, and strategies to mitigate and stabilize plant conditions provided in the emergency operating procedures (EOPs).” The EOPs assume the ECWIS nonsafety-related sump high level switch can be relied upon to alert operators in the control room that the water</p>			

level in the ECWIS pump bays are high. These high-level switches will lose power during a loss of offsite power and cannot be relied upon in that event. During an accident, there are no other means to indicate water levels in the ECWIS from the control room. UFSAR, section 15.0.8.3 continues, "Manual operator actions have been included in the event sections." The inspectors found that manual actions for providing temporary drainage of the ECWIS were not included in any event section of the UFSAR.

Appendix 9A of the UFSAR was added by CN-1910 in 1994. The licensee has submitted several revisions of the UFSAR to the NRC since this change was made. The licensee failed to submit a revision of the UFSAR that reconciles differences between Appendix 9A, section 9.2.1.2.1, and section 15.0.8.3.

Corrective Actions: The licensee entered these issues into their corrective action program.

Corrective Action References: Condition Report 2021-757

Performance Assessment: The inspectors determined this violation was associated with a minor performance deficiency.

Enforcement: The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impedes the NRC's ability to regulate using traditional enforcement to adequately deter non-compliance.

Severity: Using the NRC Enforcement Policy, dated January 15, 2020, the violation was determined to be a Severity Level IV violation in accordance with Section 6.1.d.3 because the lack of up-to-date information in the UFSAR had a material impact on safety or licensed activities.

Violation: Title 10 CFR 50.71(e), "Maintenance of Records," requires, in part, that licensees "shall update periodically, as provided in paragraphs (e)(3) and (4) of this section, the final safety analysis report (FSAR) originally submitted as part of the application for the license, to assure that the information included in the report contains the latest information developed."

Contrary to the above, from September 1994 through March 2021, the licensee failed to update the FSAR, or subsequent UFSAR, to assure that the information included in the report contained the latest information developed. Specifically, operator actions to dewater the ECWIS as stated in UFSAR Appendix 9A are contrary to statements in Section 9.2.1.2.1 that state the ECWS operates without operator actions and statements in Section 15.0.8.3 that state manual operator actions have been included in the event sections.

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

Failure to Receive Commission Approval for Changes to Mitigate Internal Flooding of Essential Cooling Water Intake Structure

Cornerstone	Significance/Severity	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green Severity Level IV NCV 05000498,05000499/2021001-02 Open/Closed	[H.13] - Consistent Process	71111.06

The inspectors identified a Green finding and associated Non-Cited Violation of 10 CFR Part 50 Appendix B, Criterion III, "Design Control," and with an associated Severity Level IV violation of 10 CFR Part 50.59(c)(2)(ii), "Changes, Tests and Experiments," for the licensee's failure to verify the adequacy of the design of the ECWIS with respect to internal flooding. Specifically, the licensee failed to adequately account for the effects of leakage allowed in the ECWIS pump bays. The licensee also failed to receive Commission approval for the establishment of an administrative limit for allowed leakage that resulted in more than a minimal increase in the likelihood of occurrence of a malfunction of the ECWS.

Description: Section 9.2.1.2 of the UFSAR, "Essential Cooling Water System," states that the safety function of the essential cooling pond and the ECW system is to provide cooling water from the ultimate heat sink for up to 30 days following a design basis event. Section 9.2.1.2.1 specifically states, in part, "The ECWS is designed to perform its cooling function following a DBA with either offsite or onsite power available, automatically and without operator action, assuming a single failure." Each unit has three trains of fifty-percent capacity pumps all housed in individual pump bays within the ECWIS.

To prevent external flooding from affecting safety-related equipment, each ECWIS pump bay is watertight from the floor level up to approximately 10½ feet. Protection from internal flooding is provided by a nonsafety-related sump pump and nonsafety-related high-level switch located in a sump in each ECWIS pump bay. During normal operations, the sump pump automatically actuates and pumps water out of the sump and into the ultimate heat sink. The only indication that comes from the nonsafety-related sump high-level switch is a hi-hi ECWIS sump level annunciator in the control room.

UFSAR appendix 9A, "Assessment of the Potential Effects of Through-Wall Cracks in ECWS Piping," was added by Change Notice 1910 of the UFSAR in 1994. Appendix 9A originally read, in part, "The maximum flooding rate in the ECWIS should be limited to 2.5 gpm, based on allowing 7 days operation before providing temporary drainage and while allowing only one-half the design basis flood accumulation." The flooding rate was changed to 2.3 gpm in 2014 by Change Notice 3092. This flooding rate is also repeated in licensee procedure, OPOP02-EW-0001, "Essential Cooling Water Operations," Revision 83. The "design basis flood accumulation" is defined in calculation MC-5216, "Flooding Calc for the Essential Cooling Water Intake Structure (ECWIS)," Revision 2. This level is based on a volume of water that would reach the motor on top of each ECW pump. It is noted for sake of reference that a flooding rate of 2.3 gpm equates to an hourly rate of 138 gph.

After investigation, the inspectors found multiple examples of design control issues associated with the ECWS:

- The inspectors found that there was no formalized calculation for the administrative limit of ECWIS leakage. The licensee failed to account for assumptions in calculation MC-5216 that ignored safety-related components in the room, most notably the safety-related 480vac motor control center that supplies power to the ECW pump discharge valve, traveling screen, and self-cleaning strainer. Even half the "design basis flood accumulation" would submerge the lower portion of the motor control center.
- The inspectors determined that the administrative limit was nonconservative. The accumulated water would be allowed to reach the base of the 480vac motor control center several days before the allowed seven days at the administrative limit of 2.3 gallons per minute. Due to the layout of the ECWIS pump bay with the watertight

entry door being a few feet above the floor level of the room, even opening the door would still submerge the bottom of the motor control center by approximately half a foot of water.

- The licensee failed to monitor the leakage from ECW pump packing. When questioned, the licensee said that pump packing is set at 0.25 gallons per minute when new packing is installed and is adjusted when it gets to approximately one gallon per minute by sight of “excessive leakage.” After the inspectors challenged the leakage rates, the licensee found that four of the six pumps had packing leakage above one gallon per minute and one pump exceeded the allowed administrative limit by over half a gallon per minute. The values were:
 - 1A ECW pump at 2.85 gpm
 - 1B ECW pump at 0.5 gpm
 - 1C ECW pump at 2.0 gpm
 - 2A ECW pump at 2.0 gpm
 - 2B ECW pump at 1.2 gpm
 - 2C ECW pump at 0.75 gpm
- The licensee failed to provide procedural guidance to dewater the ECWIS pump bays. The licensee did not train on dewatering the pump bays. The licensee did not have equipment designated as possible sources of motive force to remove the water.
- The inspectors determined the administrative limit for leakage of ECW pump packing did not account for other sources of water that may accumulate such as leakage from the self-cleaning strainer, condensation on discharge piping, possible leakage from dealloying aluminum bronze discharge piping, possible leakage from roof access panels, and possible leakage from the travelling screen booster pump.
- The inspectors brought the preceding information to the attention of the licensee. The licensee agreed that the administrative limit for leakage into the ECWIS was not conservative, but they had not yet measured the leakage of the ECW pumps. The licensee considered the ECW system to remain operable and did not enter the issue into their operability determination process. It was only after further discussions with regional NRC staff that the licensee agreed to measure the ECW pump leakage rates. After the licensee found the actual ECW pump leakage rates higher than expected (and in one case over the administrative limit), they initiated corrective actions to address the issues.

Based on this information, the inspectors concluded that the licensee had failed to verify the adequacy of the design of the ECWIS with respect to internal flooding which could negatively affect the ability of the ultimate heat sink and the ECW system to perform its safety-related function as stated in the UFSAR.

During the evaluation for UFSAR Change Notice 1910, the licensee inappropriately determined that allowing 2.3 gallons of water per minute into the ECWIS for seven days did not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the safety analysis report. The licensee allowed an amount of leakage into the ECWIS pump bays that would have challenged the operation of ECW without receiving Commission approval.

The inspectors determined that the two UFSAR change notices provided the licensee with opportunities to identify that the administrative limit increased the probability of occurrence of a malfunction of equipment important to safety. The licensee failed to adequately review the assumptions in calculation MC-5216, Revision 2, in that the actions prescribed within UFSAR section 9A challenged the ECW train to perform its safety function.

Corrective Actions: The licensee reevaluated the acceptable volume of water allowed in the ECWIS pump bays by creating a new formal calculation and established a program to routinely monitor ECW pump packing leakage.

Corrective Action References: Condition Reports CR-2021-757, CR-2021-901, CR-2021-1000, CR-2021-1005

Performance Assessment:

Performance Deficiency: The licensee's failure to verify the adequacy of the design of the ECWIS with respect to internal flooding is a performance deficiency. Specifically, the licensee failed to adequately account for the effects of leakage allowed in the ECWIS pump bays.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Design Control 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. Specifically, the allowable administrative leakage limit in the ECWIS pump bays would have flooded the safety-related energized 480vac motor-control center (required for ECW system to remain operable) several days earlier than previously evaluated.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors determined that the finding had very low safety significance (Green) because the finding describes a deficiency affecting the design of a mitigating SSC in which it maintained its operability or probabilistic risk assessment (PRA) functionality. It is noted in Manual Chapter 0609, Appendix A, that a 24-hour mission time is standard in PRA applications and should be used as a general rule in the SDP for mitigating SSCs. Therefore, this finding did not represent a condition that affected the PRA functionality of the ECW system per the significance determination process.

Cross-Cutting Aspect: H.13 - Consistent Process: Individuals use a consistent, systematic approach to make decisions. Risk insights are incorporated as appropriate. Specifically, the licensee failed to re-evaluate if the administrative limit for leakage into the ECWIS pump bays remained appropriate until further discussions with regional staff lead them to take leakage measurements from the ECW pumps.

Enforcement: The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is

necessary to address this violation which impedes the NRC's ability to regulate using traditional enforcement to adequately deter non-compliance. Specifically, the licensee allowed an amount of leakage into the ECWIS pump bays that would have challenged the operation of the trains of ECW without receiving Commission approval.

Violation: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," 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.

Contrary to the above, from September 1994 to January 2021, the licensee did not appropriately verify the adequacy of the design change for accounting for internal flooding in the ECWIS by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. Specifically, the licensee failed to provide adequate design evaluations for the ECWIS from various sources during operation of ECW pumps. The calculation to support the UFSAR Change Notice 1910 was not documented and contained a flaw in the assumptions for the volume of water that could occupy the ECWIS pump bays without affecting the operability of the ECW train. This was exacerbated by the fact that the flow rate of water continually flowing into the ECWIS pump bays during operation were not being monitored.

Title 10 CFR Part 50.59, "Changes, Tests, and Experiments," Section (c)(2) states in part, "A licensee shall obtain a license amendment pursuant to Sec. 50.90 prior to implementing a proposed change, test, or experiment if the change, test, or experiment would: ... (ii) result in more than a minimal increase in the likelihood of occurrence of a malfunction of a SSC important to safety previously evaluated in the FSAR (as updated)."

Contrary to the above, from September 1994 to January 2021, the licensee failed to obtain a license amendment prior to implementing a change that resulted in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the FSAR (as updated). Specifically, the change made to allow a nonconservative administrative limit of leakage into the ECWIS pump bays resulted in more than a minimal increase in the likelihood of occurrence of a malfunction of the trains of ECW.

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 April 22, 2021, the inspectors presented the integrated inspection results to G. T. Powell and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Procedures	0PGP03-ZO-0045	CenterPoint Energy Real Time Operations Emergency Operating Plan	3
		0PGP03-ZV-0001	Severe Weather Plan	22
		0PGP03-ZV-0004	Freezing Weather Plan	8
		0POP01-ZO-0004	Extreme Cold Weather Guidelines	40
		0POP03-ZG-0002	STP Coordinator Operations	7
		0POP04-AE-0005	Offsite Power System Degraded Voltage	15
		0POP04-ZO-0002	Natural or Destructive Phenomena Guidelines	59
71111.04	Procedures	0POP01-ZO-0011	Operability, Functionality, and Reportability Guidance	16
		0PGP03-ZX-0002	Condition Reporting Process	53
		0PGP04-ZA-0002	Condition Report Engineering Evaluation	28
		0PMP04-AF-0003	Auxiliary Feedwater Turbine Trip Throttle Valve Maintenance	39
		0PMP04-EW-0001	Essential Cooling Water Pump Maintenance	30
		0PMP04-EW-0001A	Essential Cooling Water Pump Maintenance (Product-Lubricated Bearing Design)	8
		0POP01-ZQ-0022	Plant Operations Shift Routines	84
		0POP02-CS-0001	Containment Spray Standby Lineup	17
		0POP02-EW-0001	Essential Cooling Water Operations	85
		0PSP03-AF-0007	Auxiliary Feedwater Pump 14(24) Inservice Test	59
		5R289MB01006	Essential Cooling Water System	9
		5S149MB01016	Auxiliary Feedwater System	6
71111.05	Corrective Action Documents	CR-YYYY-NNNN	2020-12638, 2021-440, 2021-1911	
	Procedures	2ECW57-FP-0604	Fire Preplan Essential Cooling Water Intake Structure Pump Room Train B	5
	Work Orders	Work Authorization Number	644916	
71111.06	Calculations	MC-5216	Flooding Calc for the Essential Cooling Water Intake Structure (ECWIS)	2

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Corrective Action Documents Resulting from Inspection	CR-YYYY-NNNN	2021-757, 2021-901, 2021-1000, 2021-1005	
	Miscellaneous	Change Notice 3092		
71111.12	Corrective Action Documents	CR-YYYY-NNNN	2019-2357, 2021-2839, 2020-12086, 2019-262	
	Miscellaneous	CREE 19-2357-2		
	Procedures	0PGP03-ZO-0056		
		0POP01-ZQ-0022	Plant Operations Shift Routines	
		0POP07-FR-0006		
	Work Orders	Work Authorization Number	613281	
71111.13	Corrective Action Documents	CR-YYYY-NNNN	2021-374	
	Procedures		Conduct of Operations - Equipment Configuration Management	22
71111.15	Calculations	MC-5216	Flooding Calc for the Essential Cooling Water Intake Structure (ECWIS)	2
		MC-5651	Essential Cooling Water System Failure Modes and Effects Analysis	1
	Corrective Action Documents	CR-YYYY-NNNN	2021-757, 2021-1000, 2021-1028, 2021-945, 2021-1521, 2021-1468, 2021-798, 2019-2357,	
	Engineering Evaluations		19-9047-2	
	Procedures	0PSP03-SP-0007C	SSPS Actuation Train C Master Relay Test	24
	Work Orders	Work Authorization Number	644500, 563912	
71111.18	Corrective Action Documents	CR-YYYY-NNNN	2021-2979	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.19	Corrective Action Documents	CR-YYYY-NNNN	2021-968, 2021-981, 2021-1005	
	Procedures	0PMP07-DG-0001	Standby Diesel Recording M&TE Installation	7
		0PSP03-DG-0001	Standby Diesel 11(21) Operability Test	62
	Work Orders	Work Authorization Number	513011, 584078, 585845, 569535, 616863, 616673	
71111.20	Procedures	0PGP03-ZG-0006	Plant Shutdown from 100% to Hot Standby	78
		0POP03-ZG-0007	Plant Cooldown	96
71111.22	Procedures	00O101-OL-0005	Operations Logs - Diesel Generator	16
		0PEP07-ZE-0001	CLocal Leakage Rate Test Rig Integrity Check	
		0PEP07-ZE-0002	LLRT Rig Operation	
		0PGP03-ZE-0004	Plant Surveillance Program	
		0PGP03-ZX-0002	Condition Reporting Process	
		0PGP0e-ZA-0090	CWork Control Process	
		0PSP01-ZA-0001	Plant Operations Department Administration Guidelines	52
		0PSP03-DG-0002	Standby Diesel 12(22) Operability Test	65
		0PSP03-RH-0009	Residual Heat Removal System Valve Operability Test	17
		0PSP03-RH-0009	Residual Heat Removal System Valve Operability Test	17
		0PSP03-SI-0002	Low Head Safety Injection Pump 1B(2B) Inservice Test	19
		0PSP03-SI-0005	High Head Safety Injection Pump 1B(2B) Inservice Test	23
		0PSP03-SI-0014	CCS Valve Checklist	21
		0PSP03-SI-0017	Containment Spray Valve Checklist	21
		0PSP05-EH-6328	Turbine Throttle Valve Limit Switch Calibration (Z-6328)	15
		0PSP11-ZA-0005	CLocal Leakage Rate Test Calculations, Guidelines, and Program	
	71114.06	Procedures	0ERP01-ZV-IN01	Emergency Classification
0ERP01-ZV-IN02			Notifications to Offsite Agencies	35

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		0POP05-EO-EO00	Reactor Trip or Safety Injection	26
		0POP05-EO-EO10	Loss of Reactor or Secondary Coolant	23
		0POP05-EO-ES13	Transfer to Cold Leg Recirculation	12
71151	Procedures	0PAP01-ZA-0101	Plant Procedure Writer's Guide	8
		0PGP03-ZA-0010	Performing and Verifying Station Activities	41
		0PGP03-ZA-0090	Work Process Program	44
		0PGP05-ZN-0007	Preparation and Submittal of NRC Performance Indicators	9
71152	Corrective Action Documents	CR-YYYY-NNNN	2021-757, 2021-1000	