



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

August 11, 2022

EA-22-058

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 05000498/2022002 AND 05000499/2022002 AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION INSPECTION REPORT 07201041/2022002 AND EXERCISE OF ENFORCEMENT DISCRETION**

Dear Mr. Powell:

On June 30, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at South Texas Project Electric Generating Station, Units 1 and 2. On July 21, 2022, 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.

Two findings of very low safety significance (Green) are documented in this report. Two of these findings involved violations of NRC requirements. We are treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

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.

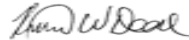
If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies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

In addition, the NRC identified a violation of Title 10 of the *Code of Federal Regulations* (10 CFR) 72.212(b)(6) associated with tornado hazard protection. Because this violation was

identified during the discretion period covered by Enforcement Guidance Memorandum 22-001, "Enforcement Discretion for Noncompliance of Tornado Hazard Protection Requirements at Independent Spent Fuel Storage Installations," and because the licensee was implementing compensatory measures and plans to take the necessary actions to restore compliance, the NRC is exercising enforcement discretion by not issuing an enforcement action for the violation and is allowing continued independent spent fuel storage installation handling operations.

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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,



Signed by Deese, Richard  
on 08/11/22

Richard W. Deese,  
Acting Chief, Projects Branch A  
Division of Operating Reactor Safety

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

Enclosure:  
As stated

cc w/ encl: Distribution via LISTSERV

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION, UNITS 1 AND 2 –  
 INTEGRATED INSPECTION REPORT 05000498/2022002 AND 05000499/2022002 AND  
 INDEPENDENT SPENT FUEL STORAGE INSTALLATION INSPECTION REPORT  
 07201041/2022002 AND EXERCISE OF ENFORCEMENT DISCRETION– AUGUST 11, 2022

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

Docket Numbers: 05000498; 05000499 and 07201041

License Numbers: NPF-76 and NPF-80

Report Numbers: 05000498/2022002; 05000499/2022002 and 07201041/2022002

Enterprise Identifier: I-2022-002-0009 and 1-2022-001-0002

Licensee: STP Nuclear Operating Company

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

Location: Wadsworth, TX

Inspection Dates: April 1, 2022, to June 30, 2022

Inspectors: L. Brookhart, Senior Spent Fuel Storage Inspector  
S. Hedger, Senior Emergency Preparedness Inspector  
G. Kolcum, Senior Resident Inspector  
S. Lichvar, Project Engineer  
C. Stott, Resident Inspector

Approved By: Richard W. Deese, Acting Chief  
Projects Branch A  
Division of Operating Reactor Safety

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. 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 Provide Adequate Test Procedures for Replacement Essential Chiller Temperature Current Modules			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000498,05000499/2022002-01 Open/Closed	[P.2] - Evaluation	71152A
The inspectors identified a Green finding and associated non-cited violation (NCV) of Technical Specification (TS) 6.8.1.a, for the licensee’s failure to properly preplan and implement adequate written procedures as required by Regulatory Guide 1.33, “Quality Assurance Program Requirements (Operation),” revision 2, appendix A, section 9, “Procedures for Performing Maintenance.” Specifically, written procedures were not adequate for testing of replacement temperature current modules for the safety-related essential chillers. Several temperature current modules were tested using procedure 0PTP04-ZM-0107, “Functional Testing of York Temperature Current Controller Modules,” revision 1, which failed to include steps to adequately test components of the modules which caused temperature drifting issues of the chilled water from the essential chillers.			

Failure to Identify Conditions Adverse to Quality Within Essential Cooling Water System			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000498,05000499/2022002-02 Open/Closed	[H.12] - Avoid Complacency	71152S
The inspectors identified a Green finding and associated non-cited violation (NCV) of 10 CFR Appendix B, Criterion XVI, “Corrective Action,” for the licensee’s failure to identify and correct multiple examples of conditions adverse to quality. Specifically, the licensee failed to identify out-of-tolerance essential cooling water expansion joints and failed to identify degraded essential cooling water throttle valves that provide cooling to the emergency diesel generators.			

### Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
EDG	EA-22-058	Enforcement Action EA-22-058: Tornado Hazards Protection at Independent Spent Fuel Storage Installations (EGM 22-001)	60855	Closed

## PLANT STATUS

Unit 1 and Unit 2 began the inspection period at rated thermal power and remained there for the entire 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," 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 hurricane season for the following systems:
  - Emergency diesel generator the week of June 13, 2022
  - Essential cooling water pond the week of June 13, 2022

### 71111.04 - Equipment Alignment

#### Partial Walkdown Sample (IP Section 03.01) (7 Samples)

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

- (1) Unit 2, train A control room ventilation on April 8, 2022
- (2) Unit 2, train C control room ventilation on April 8, 2022
- (3) Unit 2, loops A, B, and C narrow range temperature indications on April 9, 2022
- (4) Unit 1, offsite power lineup on April 13, 2022
- (5) Unit 2, offsite power lineup on April 13, 2022
- (6) Unit 2, train A essential cooling water system while train B was out of service during the week of May 9, 2022
- (7) Unit 1, train A essential chiller while train C was out of service on May 27, 2022

### 71111.05 - Fire Protection

#### Fire Area Walkdown and Inspection Sample (IP Section 03.01) (6 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 1, electrical auxiliary building train B cable spreading/power cabling area on April 19, 2022
- (2) Unit 2, electrical auxiliary building train B cable spreading/power cabling area on April 19, 2022
- (3) Unit 1, electrical auxiliary building train A qualified display processing system room on April 20, 2022
- (4) Unit 2, electrical auxiliary building train A qualified display processing system room on April 20, 2022
- (5) Unit 1, essential chiller and component cooling water pump rooms on June 1, 2022
- (6) Fire pump house on June 27, 2022

#### 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) Unit 2, electrical auxiliary building the week of April 11, 2022

#### 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 Units 1 and 2 south bus lockout on April 13, 2022.

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

- (1) The inspectors observed and evaluated an operations crew respond to various plant alarm scenarios on June 1, 2022.

#### 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, startup feedwater pump 14 the week of April 20, 2022
- (2) Units 1 and 2, switchyard south bus maintenance on May 6, 2022
- (3) Unit 1, 250VDC battery charger the week of May 9, 2022

#### 71111.13 – Maintenance Risk Assessments and Emergent Work Control

##### Risk Assessment and Management Sample (IP Section 03.01) (6 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, standby transformer maintenance the week of April 11, 2022
- (2) Unit 1, planned white risk due to maintenance during the week of April 11, 2022
- (3) Switchyard south bus maintenance on April 13, 2022
- (4) Unit 2, switchyard south bus maintenance on May 6, 2022
- (5) Unit 2, planned yellow risk due to maintenance during the week of May 9, 2022
- (6) Unit 1, planned yellow risk due to maintenance during the week of May 30, 2022

#### 71111.15 – Operability Determinations and Functionality Assessments

##### Operability Determination or Functionality Assessment (IP Section 03.01) (8 Samples)

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

- (1) Unit 2, train B control room ventilation on April 7, 2022
- (2) Unit 2, loop D hot leg narrow range temperature element failed low on April 10, 2022
- (3) Unit 2, secondary containment level switch reads low on April 14, 2022
- (4) Units 1 and 2, switchyard south bus lockout on 345 kV bus due to insulator failures on April 13, 2022
- (5) Fire pump 1 water sample the week of May 2, 2022
- (6) Unit 2, qualified display processing system channel D alarms on May 8, 2022
- (7) Unit 1, qualified display processing system alarm on May 10, 2022
- (8) Unit 1, incore detector drive unit F on June 16, 2022

#### 71111.19 – Post-Maintenance Testing

##### Post-Maintenance Test Sample (IP Section 03.01) (7 Samples)

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

- (1) Unit 2, circulating water pump 23 on April 8, 2022
- (2) Unit 2, secondary sump level switch on April 14, 2022
- (3) Unit 1, FLEX spent fuel makeup pump 15 on April 14, 2022
- (4) Unit 1, 250VDC battery charger 1 on April 23, 2022
- (5) Unit 1, 250VDC battery charger 1 on April 30, 2022
- (6) Unit 2, train B essential cooling water traveling screen on June 13, 2022
- (7) Unit 1, train B control room envelope HVAC on June 16, 2022

#### 71111.22 – Surveillance Testing

The inspectors evaluated the following surveillance testing activities to verify system operability and/or functionality:

##### Surveillance Tests (other) (IP Section 03.01) (4 Samples)



- (1) Unit 2, containment spray valve position verification on April 9, 2022
- (2) Unit 2, emergency core cooling system valve checklist on April 9, 2022
- (3) Unit 1, train B emergency diesel generator 24-hour load test on April 10, 2022
- (4) Unit 2, train D auxiliary feedwater pump on June 2, 2022

Inservice Testing (IP Section 03.01) (1 Sample)

- (1) Unit 2, train B essential cooling water pump inservice test on April 10, 2022

FLEX Testing (IP Section 03.02) (1 Sample)

- (1) Unit 1, train A FLEX diesel test on May 19, 2022

71114.06 – Drill Evaluation

Drill/Training Evolution Observation (IP Section 03.02) (1 Sample)

The inspectors evaluated:

- (1) the licensee's simulator-based licensed operator training evolution that involved a tornado, loss of offsite power, steam generator tube leak, and an Alert notification on June 8, 2022.

71114.08 – Exercise Evaluation – Scenario Review

Inspection Review (IP Section 02.01 – 02.04) (1 Sample)

- (1) The inspectors reviewed the licensee's preliminary exercise scenario that was submitted to the NRC on May 18, 2022, (ADAMS Accession No. ML22139A276) for the exercise scheduled to occur on July 20, 2022. The inspectors discussed the preliminary scenario with Mr. G. Cramer, Manager, Emergency Preparedness, and other members of the emergency preparedness staff on June 7, 2022. The inspectors' review does not constitute NRC approval of the scenario.

**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 (April 1, 2021, through March 31, 2022)
- (2) Unit 2 (April 1, 2021, through March 31, 2022)

BI01: Reactor Coolant System (RCS) Specific Activity Sample (IP Section 02.10) (2 Samples)

- (1) Unit 1 (April 1, 2021, through March 31, 2022)
- (2) Unit 2 (April 1, 2021, through March 31, 2022)

BI02: RCS Leak Rate Sample (IP Section 02.11) (2 Samples)

- (1) Unit 1 (April 1, 2021, through March 31, 2022)
- (2) Unit 2 (April 1, 2021, through March 31, 2022)

#### 71152A - Annual Follow-up Problem Identification and Resolution

##### Annual Follow-up of Selected Issues (Section 03.03) (1 Sample)

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

- (1) Unit 1, train C essential chiller temperature control module issues

#### 71152S – Semiannual Trend Problem Identification and Resolution

##### Semiannual Trend Review (Section 03.02) (1 Sample)

- (1) The inspectors reviewed the licensee's corrective action program for potential adverse trends in essential cooling water issues that might be indicative of a more significant safety issue.

### **OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL**

#### 60855 – Operation of an Independent Spent Fuel Storage Installation (ISFSI)

The inspectors performed a review of the licensee's independent spent fuel storage installation (ISFSI) activities to verify compliance with requirements of the Certificate of Compliance 72-1032, License Amendment 2, and the HI-STORM FW Final Safety Analysis Report (FSAR), revision 5. The inspectors reviewed selected procedures, corrective action reports, and records to verify ISFSI operations were compliant with the Certificate's technical specifications, requirements in the FSAR, and NRC regulations.

##### Operation Of an ISFSI (1 Sample)

- (1) Inspectors evaluated the licensee's dry cask storage operations from June 13-17, 2022, during an on-site inspection. The STP ISFSI consisted of one concrete pad that was designed to hold 90 HI-STORM FW Version XL overpacks each containing a Multi-Purpose Canister with 37 fuel assemblies (MPC-37). At the time of the routine inspection, the ISFSI pads contained a total of 20 overpacks and the licensee was in the process of loading canister 21.

During the on-site inspection, the inspectors evaluated and observed the following activities:

- loading and verification of spent fuel into canister 21
- walkdown of the ISFSI pad
- heavy load lifts using the cask handling crane to place the canister lid, while under water in spent fuel pool cask loading pit
- canister welding and non-destructive testing activities
- canister hydrostatic pressure testing
- canister drying

- canister helium backfill
- transfer cask lift using fuel building crane to accomplish stack-up activity

The inspectors reviewed and evaluated the following documentation during the inspection:

- fuel selection evaluations for the canisters loaded since the last NRC ISFSI inspection (canisters 2 – 21)
- radiation surveys for radiological dose at the owner-controlled boundary to verify compliance with the requirements of 10 CFR 72.104 for years 2019 – 2021
- selected ISFSI-related condition reports issued since the last NRC ISFSI inspection
- quality assurance program implementation, including recent audits, surveillances, receipt inspection, and quality control activities related to ISFSI operations
- compliance to technical specifications for operational surveillance activities and FSAR required annual maintenance activities
- documentation of annual maintenance activities for the site’s cask handling crane, vertical cask transporter, and special lifting devices
- selected licensee design changes and program changes to the ISFSI performed under the site’s 10 CFR 72.48 program
- changes that had been made by the licensee to the site’s 10 CFR Part 72.212 Evaluation report since the last inspection, from revision 0 to 2.

## INSPECTION RESULTS

Enforcement Discretion	Enforcement Action EA-22-058: Tornado Hazards Protection at Independent Spent Fuel Storage Installations (EGM 22-001)	60855
<p><u>Description:</u> Upon issuance of U.S. NRC Enforcement Guidance Memorandum (EGM) 22-001 (ML22087A496), dated April 15, 2022, the licensee performed an assessment of all outdoor dry cask storage activities that were not explicitly analyzed for tornado hazards in the system’s FSAR. Two configurations were identified by the licensee where transport activities did not have a related tornado wind and hazard analysis consistent with the cask’s design basis requirements. These situations occurred during outside operations when the HI-STORM FW overpack was on the low-profile transporter with the HI-STORM FW overpack lid bolts not engaged and when the Vertical Cask Transporter carried the overpack using the HI-STORM FW lifting brackets.</p> <p>The Holtec HI-STORM FSAR Section 2.2, <i>HI-STORM FW Design Loading</i>, which includes Section 2.2 iv. <i>Short Term Operations</i>, “normal operation evolutions necessary to support fuel loading or unloading activities,” describes the general design criteria for the cask system. This includes all off-normal condition loads, environmental phenomena, and accident conditions. Specifically, FSAR Section 2.2.3.e. <i>Environmental Phenomena and Accident Condition Design Criteria – Tornado</i>, describes that the FW system must withstand pressures, wind loads, and missiles generated by a tornado while maintaining kinematic stability and continued integrity of the canister and must be demonstrated. Tornado hazards are evaluated in the FSAR section 3.1.2.1.e., <i>Design Criteria and Applicable Loads – Tornado</i>, Tornado</p>		

Wind and Missile Impact, Section 3.4.4.1 *Safety Analysis*, and Section 12.2.6.1, *Tornado Analysis*. These sections of the FSAR do not include an analysis for tornado hazards when the overpack was on the low-profile transporter with the HI-STORM FW overpack lid bolts not engaged and when the Vertical Cask Transporter carried the overpack using the HI-STORM FW lifting brackets.

Corrective Actions: The licensee followed the guidance actions as described in the EGM. The issue was entered into the corrective action program (CAP) and the licensee established additional measures to mitigate tornado hazards, through procedures, during periods of ISFSI handling operations. These actions included, restricting outdoor dry cask storage activities during periods of adverse weather, establishing meteorological criteria, designating staff to monitor weather during ISFSI handling operations, describing actions to take in the event of severe weather necessary to place the cask in an analyzed condition, minimizing the duration of ISFSI handling operations during which ISFSI important to safety structures, systems, and components (SSCs) are in an unanalyzed condition, documentation that required weather checks are complete prior to the start of ISFSI handling operations, and documenting in the CAP a request for the Certificate of Compliance (CoC) holder to request an amendment within six months of the date of the EGM or implement physical design modifications and/or perform evaluations that demonstrate important to safety SSCs are designed to withstand the effects of natural phenomena, including tornadoes and tornado-generated missiles prior to the expiration date of the EGM (April 15, 2024).

Corrective Action References: CR 22-4002

Enforcement:

Significance/Severity: This violation was dispositioned in accordance with the traditional enforcement process using Section 2.3 of the NRC's Enforcement Policy. This issue was determined by inspectors to be of more than minor safety significance, since if left uncorrected, the deficiency could lead to a more significant safety concern. Consistent with the guidance in the NRC Enforcement Manual, Part 1, Section 1.2.6.D if a violation does not fit an example in the Enforcement Policy Violation Examples, it should be assigned a severity level: (1) commensurate with its safety significance; and (2) informed by similar violations addressed in the Violation Examples. The violation was evaluated to be similar to a Severity Level IV violation in Enforcement Policy Section 6.5.d.2.

Violation: Title 10 CFR 72.212(b)(6), states, in part, that the general licensee must review the Safety Analysis Report referenced in the CoC or amended CoC and the related NRC Safety Evaluation Report, prior to use of the general license, to determine whether or not the reactor site parameters, including analyses of earthquake intensity and tornado missiles, are enveloped by the cask design bases considered in these reports.

Contrary to the above from February 2019 to April 15, 2022, the licensee failed to determine whether or not reactor site parameters including analyses of tornado missiles were enveloped by the cask design bases. Specifically, the licensee failed to perform an analysis consistent with FSAR section 2.2 to demonstrate the HI-STORM FW cask system would maintain kinematic stability and continued integrity of the canister during short term operations, such as, when the overpack was on the low-profile transporter with the HI-STORM FW overpack lid bolts not engaged and when the Vertical Cask Transporter carried the overpack using the HI-STORM FW lifting brackets.

Basis for Enforcement Discretion: In general, the NRC has extensive history analyzing severe weather events including tornado hazard scenarios using probabilistic methods (or risk assessments) in licensing on a case-by-case basis to assess specific plant features to prevent a release of radioactivity exceeding regulatory limits. For ISFSIs, such methods can be employed, supported by analysis, to demonstrate that tornado hazards will not impair the capability of SSCs important to safety to perform their intended design functions.

The Office of Nuclear Reactor Regulation (NRR) completed a generic risk analysis of potential tornado missile protection non-compliances to examine the risk significance of tornado hazard scenarios (Agencywide Documents Access and Management System (ADAMS) at Accession No. ML14114A556). In this case, the generic bounding risk analysis performed by NRR concluded that a tornado missile scenario is of low-risk significance at power reactor sites, due in part to the low probability of wind speeds exceeding 75 miles per hour (less than  $4 \times 10^{-4}$  per year). This generic analysis did not specifically address ISFSI handling operations but there are several key insights in the analysis that may apply to a risk assessment for this issue. Specifically, rather than evaluate site-specific configurations, the NRR generic analysis used bounding assumptions regarding tornado and high winds initiating event frequencies (IEFs) coupled with bounding assumptions for missile strike area to develop conservative estimates of core-damage frequency. This generic analysis assumes that plants are in a condition vulnerable to a tornado for a full reactor-year worth of exposure time.

For ISFSI handling operations, the vulnerable configuration would be typically limited to a few weeks of exposure time per year which would result in additional conservatism to the results documented in the NRR generic analysis. Furthermore, ISFSI handling operations that may lead to loss of confinement of radioactive material due to a missile strike or high winds should be bounded by the assumptions regarding tornado and high winds IEFs. Appropriate administrative controls including compensatory measures would provide defense-in-depth and further reduce the likelihood of occurrence and mitigate loss of confinement events. This defense-in-depth approach should include provisions to (1) preclude ISFSI handling operations during periods of adverse weather or when adverse weather is predicted, and (2) provide compensatory measures to place important to safety SSCs in an analyzed condition or provide physical protection as necessary to maintain confinement of radioactive material during ISFSI handling operations.

In summary, the combination of the low probability of tornado events in conjunction with formally documented administrative controls that (1) restrict initiation of ISFSI handling operations during projected periods of adverse weather and, (2) cease ISFSI handling operations and place important to safety SSCs in a protected configuration or analyzed condition at the outset of adverse weather conditions, form the basis for the exercise of enforcement discretion for ISFSI handling operations. As a further condition of this enforcement discretion, licensees will conduct a site-specific assessment to determine the appropriate corrective actions to ensure that important to safety SSCs will not be adversely impacted by tornado hazards. As such, the exercise of enforcement discretion limited to the conditions of this EGM will not impose significant additional risk to public health and safety.

Since this violation was identified during the discretion period covered by Enforcement Guidance Memorandum 22-001, "Enforcement Discretion for Noncompliance of Tornado Hazard Protection requirements at Independent Spent Fuel Storage Installations," and because the licensee was implementing compensatory measures and has taken or plans to take the necessary actions to restore compliance, the NRC is exercising enforcement

discretion by not issuing an enforcement action for the violation and is allowing continued ISFSI handling operations.

Failure to Provide Adequate Test Procedures for Replacement Essential Chiller Temperature Current Modules

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000498,05000499/2022002-01 Open/Closed	[P.2] – Evaluation	71152A

The inspectors identified a Green finding and associated non-cited violation (NCV) of Technical Specification (TS) 6.8.1.a, for the licensee’s failure to properly preplan and implement adequate written procedures as required by Regulatory Guide 1.33, “Quality Assurance Program Requirements (Operation),” revision 2, appendix A, section 9, “Procedures for Performing Maintenance.” Specifically, written procedures were not adequate for testing of replacement temperature current modules for the safety-related essential chillers. Several temperature current modules were tested using procedure OPTH04-ZM-0107, “Functional Testing of York Temperature Current Controller Modules,” Revision 1, which failed to include steps to adequately test components of the modules which caused temperature drifting issues of the chilled water from the essential chillers.

Description: The essential chillers are credited to supply chilled water to air handling units that provide suitable environments for personnel and class 1E equipment located in the electrical auxiliary, mechanical auxiliary, and fuel handling buildings during upset and faulted conditions.

On June 10, 2021, the licensee noted a high out-of-specification reading for chilled water for essential chiller 12C which read 49.3°F. The chilled water temperature coming from the essential chillers is set to 42°F with an administrative specification up to 48°F even though the chilled water could rise to 52°F before the operators would be required by procedure to call the associated essential chiller inoperable. The licensee was able to use the temperature current module to adjust the chilled water temperature to less than 48°F.

On August 4, 2021, the licensee noted a high out-of-specification reading for chilled water for essential chiller 12C which read 48.5°F. The licensee replaced the temperature current module and tested essential chiller 12C on August 5, 2021.

On August 7, 2021, the licensee again noted that chilled water for essential chiller 12C read 48.1°F. The licensee declared essential chiller 12C inoperable, performed extensive troubleshooting, and noted during troubleshooting that the temperature would hold steady for a period before making a step change up in temperature. As the licensee observed data on testing equipment, the licensee determined that the potentiometers on the temperature current module were sensitive to the vibrations of the chiller. The licensee again replaced the temperature current module on August 12, 2021, before performing more testing and declaring essential chiller 12C operable.

The temperature current module uses a servo system with inputs from the chilled water temperature sensors to modulate the pre-rotation vanes and hot gas valve to obtain the setpoint for chilled water temperature. The temperature current module is located on the side of the essential chiller with knobs on potentiometers that the licensee sets for desired temperature current. The licensee determined that vibrations from the chiller would cause a

drift of the internal setpoints of the temperature current module, thus causing a change to the setpoint and the chiller would start controlling at a new, higher temperature.

The inspectors noted that the licensee sends off temperature current modules to a vendor to be refurbished after they are replaced. The vendor replaces components within the module and the licensee performs an acceptance test for the entire temperature current module to ensure the module will work under design conditions using procedure OPTH04-ZM-0107, "Functional Testing of York Temperature Current Controller Modules," revision 1. The licensee failed to include steps within procedure OPTH04-ZM-0107 to test the temperature control point potentiometer on more than a single-point verification.

The inspectors also noted that a similar set of temperature current module failures occurred in May and June of 2020. The licensee replaced the essential chiller 12C temperature current module twice in the span of a month due to chilled water temperature drifting upward.

Corrective Actions: The licensee has developed changes to the testing procedure of the temperature current modules in order to ensure all the components are tested and include appropriate hold points to help ensure the temperature setpoint from drifting. The licensee also changed the design of the potentiometers on the temperature current modules which includes a wider range of motion to change temperature settings as well as incorporating a locking mechanism to preclude setpoint drift.

Corrective Action References: Condition Reports (CR) 2020-5599, CR 2020-6310, CR 2020-6368, CR 2020-7507, CR 2021-6580, CR 2021-8442, CR 2021-8518

Performance Assessment:

Performance Deficiency: The licensee failed to properly preplan and implement adequate written procedures as required by Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," revision 2, appendix A, section 9, "Procedures for Performing Maintenance." Specifically, written procedures were not adequate for testing of replacement temperature current modules for the safety-related essential chillers. Several temperature current modules were tested using procedure OPTH04-ZM-0107, "Functional Testing of York Temperature Current Controller Modules," revision 1, which failed to include steps to adequately test components of the modules which caused temperature drifting issues of the chilled water from the essential chillers.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Procedure Quality 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 licensee declared essential chiller 12C inoperable due to temperature drifting issues associated with the temperature current module on multiple occasions.

Significance: The inspectors assessed the significance of the finding using Manual Chapter 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors determined that this finding is of very low safety significance (Green), because it did not represent a loss of a probabilistic risk assessment (PRA) function greater than its allowed technical specification (TS) allowed outage time, a loss of PRA function for two separate technical specification systems for greater than 24 hours, a loss of a PRA system or function defined in the Plant Risk Information e-Book (PRIB) or licensee's PRA for greater

than 24 hours, or loss of the PRA function of one or more non-TS trains of equipment designated as risk-significant in accordance with the licensee’s maintenance rule program for greater than 3 days.

**Cross-Cutting Aspect: P.2 - Evaluation:** The organization thoroughly evaluates issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. There were numerous instances when chilled water temperatures were noted as high-out-of-band associated with essential chiller 12C. The licensee failed to adequately test the necessary components related to temperature control of the essential chillers.

Enforcement:

**Violation:** Technical Specification 6.8.1.a requires, in part, that written procedures shall be established, implemented, and maintained covering activities referenced in Appendix A of Regulatory Guide 1.33, revision 2. Appendix A, Section 9 of Regulatory Guide 1.33 requires that maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures or documented instructions appropriate to the circumstances.

Contrary to the above, from May 2020 to April 2022, for maintenance that can affect the performance of safety-related equipment (testing essential chiller temperature current modules), the licensee failed to properly preplan and perform the activity in accordance with written procedures appropriate to the circumstances. Specifically, procedure OPTH04-ZM-0107, “Functional Testing of York Temperature Current Controller Modules,” revision 1, failed to include steps to test all the components of the modules which caused temperature drifting issues of the chilled water from the essential chillers.

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

**Failure to Identify Conditions Adverse to Quality Within Essential Cooling Water System**

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000498,05000499/2022002-02 Open/Closed	[H.12] - Avoid Complacency	71152S

The inspectors identified a Green finding and associated non-cited violation (NCV) of 10 CFR Appendix B, Criterion XVI, “Corrective Action,” for the licensee’s failure to identify and correct multiple examples of conditions adverse to quality. Specifically, the licensee failed to identify out-of-tolerance essential cooling water expansion joints and failed to identify degraded essential cooling water throttle valves that provide cooling to the emergency diesel generators.

Description: The inspectors identified multiple examples of the licensee failing to identify conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material, and equipment, and nonconformances as stated in 10 CFR 50, Appendix B, Criterion XVI, “Corrective Actions.”

The licensee failed to identify conditions adverse to quality for several out-of-tolerance expansion joints. On November 17, 2021, the inspectors noted that the expansion joint



located at the essential cooling water pump 1A discharge was expanded further than allowed per design documentation. The licensee has scheduled a work activity to place a spacer to return the expansion joint to within design allowances. The essential cooling water supply and discharge pipe expansion joints for emergency diesel generator 11 lube oil cooler were also expanded further than allowed by design. The licensee repositioned the associated essential cooling water piping for the return line expansion joint and replaced the supply side expansion joint. Similar expansion joints were also found out of alignment for emergency diesel generators 13 and 21 lube oil coolers which are scheduled to be corrected.

In addition, the licensee failed to identify conditions adverse to quality for three essential cooling water throttle valves supplying cooling water to the emergency diesel generators jacket water system. Emergency diesel generators 12, 22, and 23 each have a throttle valve to control the flow rate of essential cooling water to the jacket water heat exchanger for the associated diesel. On January 13, 2022, the inspectors noted that each valve indicated nearly shut even though the valve line-ups performed had required a throttled position. The valves are set after a flow balance is performed for the individual diesels. The licensee uses strap-on ultrasonic flow meters to determine when the valves are in position to provide sufficient flow per design requirements. After the valves are in the required position, they are left with a locking device in place. The control room cannot determine how much flow is routed to each diesel generator jacket water heat exchanger, lube oil heat exchanger, or intercooler loads between flow balance tests. The operators know only how much overall flow is going to each diesel. The licensee did not initiate condition reports for the throttle valves which indicated closed. The licensee determined these essential cooling water throttle valves to each jacket water system was in fact degraded and not just a valve indicator issue.

The inspectors reviewed the results of essential cooling water flow balance tests as performed by preventive maintenance work orders dating back to October 2017. The inspectors found examples of the as-found flow balance tests would produce results that did not meet acceptance criteria required by the preventive maintenance work order. The licensee did ensure to return the flow rates within acceptance criteria bands before returning the system to service but failed to write condition reports for the as-found conditions. The licensee determined the degradation is caused by erosion of the disk-to-seat interface.

Corrective Actions: For the essential cooling water expansion joints, the licensee has performed an evaluation and has completed or scheduled to replace or adjust a total of five expansion joints. For the essential cooling water throttle valves for the emergency diesel generator loads, the licensee has scheduled to replace the three essential cooling water throttle valves that the inspectors found in upcoming train work outages, along with two others previously found by the licensee.

Corrective Action References: CR 2020-6368, CR 20 21-8518, CR 2021-12337, CR 2021-12450, CR 2022-451, CR 2022-452, CR 2022-453, CR 2022-498, CR 2022-499, CR 2022-721, CR 2022-784, CR 2022-5508

Performance Assessment:

Performance Deficiency: The failure to identify and correct conditions adverse to quality is a performance deficiency. Specifically, the licensee failed to identify out-of-tolerance essential cooling water expansion joints and failed to identify degraded essential cooling water throttle valves that provide essential cooling water to the emergency diesel generators.

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. Specifically, the licensee failed to identify multiple conditions adverse to quality concerning essential cooling water expansion joints and essential cooling water throttle valves. Out-of-tolerance expansion joints can result in increased stresses which can reduce component life. Degraded essential cooling water throttle valves are relied on to provide adequate cooling to the emergency diesel generator jacket water heat exchanger, lube oil heat exchanger, and turbocharger intercooler. These locked and independently-verified butterfly throttle valves are adjusted to ensure flow rates are within the required design flows. Degradation of these valves can lead to flows outside of acceptance criteria which could challenge operability of the emergency diesel generators.

Significance: The inspectors assessed the significance of the finding using Manual Chapter 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors determined that this finding is of very low safety significance (Green), because it did not represent a loss of a probabilistic risk assessment (PRA) function greater than its allowed technical specification (TS) allowed outage time, a loss of PRA function for two separate TS systems for greater than 24 hours, a loss of a PRA system or function defined in the Plant Risk Information e-Book (PRIB) or licensee's PRA for greater than 24 hours, or loss of the PRA function of one or more non-TS trains of equipment designated as risk-significant in accordance with the licensee's maintenance rule program for greater than 3 days.

Cross-Cutting Aspect: P.1 - Identification: The organization implements a corrective action program with a low threshold for identifying issues. Individuals identify issued completely, accurately, and in a timely manner in accordance with the program. Specifically, the above listed examples detail how the licensee failed to identify issues at a low threshold.

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected.

Contrary to the above, from October 2017 to January 2022, the licensee failed to establish measures to assure conditions adverse to quality were promptly identified and corrected. Specifically, the licensee failed to identify out-of-tolerance essential cooling water expansion joints and failed to identify degraded essential cooling water throttle valves that provide cooling to the emergency diesel generators.

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 June 7, 2022, the inspectors presented the emergency preparedness exercise scenario review inspection results to Mr. G. Cramer, Manager, Emergency Preparedness, and other members of the licensee staff.

- On June 22, 2022, the inspectors presented the ISFSI Spent Fuel Loading inspection results to Mr. G. T. Powell, President & CEO and other members of the licensee staff.
- On July 21, 2022, the inspectors presented the integrated inspection results to Mr. G. T. Powell and other members of the licensee staff.

## DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
60855	Corrective Action Documents	CR-YYYY-NNNN	2022-4002, 2022-0691, 2022-1126, 2019-4530, 2019-1653	
60855	Miscellaneous	10 CFR 72.212	ISFSI 10 CFR 72.212 Evaluation Report, NRC Docket 72-1041	2
60855	Miscellaneous	CoC 72-1032	Certificate of Compliance 72-1032, Holtec HI-STORM FW License, Amendment 2	
60855	Miscellaneous	FSAR	Holtec HI-STORM FW	5
60855	Procedures	0DCS03-ZO-0001	HI-STORM Transport Operations	9
60855	Procedures	0DCS03-ZO-0003	MPC Loading Operations	13
60855	Procedures	0DCS03-ZO-0004	MPC Closure Operations	10
60855	Procedures	0DCS03-ZO-0005	MPC Transfer Operations	13
60855	Procedures	0DCS03-ZO-0008	DCS Abnormal Response	3
71111.01	Procedures	0POP02-EW-0001	Essential Cooling Water Operations	85
71111.01	Procedures	5Q159-MB-1023	Standby Diesel Generator System	4
71111.01	Procedures	5R289-MB-01006	Essential Cooling Water System	9
71111.04	Corrective Action Documents	CR-YYYY-NNNN	2022-3566, 2022-5258	
71111.05	Procedures	0-EAB31-FP-0047	Cable Spreading/Power Cabling Area Train B, Elevation 60'	7
71111.05	Procedures	0-EAB76-FP-0017	QDPS Train A, Elevation 10' -0" to 19' -03"	3
71111.05	Procedures	0MAB02-FP-0128	Fire Preplan Mechanical Auxiliary Building CCW Pump and Chiller, Train A	4
71111.05	Procedures	0MAB27-FP-0139	Fire Preplan Mechanical Auxiliary Building CCW Pump and Chiller, Train C	4
71111.05	Procedures	0MAB29-FP-0140	Fire Preplan Mechanical Auxiliary Building CCW Pump and Chiller, Train B	3
71111.06	Work Orders	Work Authorization Number	619991	
71111.15	Corrective Action	CR-YYYY-NNNN	2022-3566, 2022-3737, 2022-3717, 2022-4263, 2022-4569,	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Documents		2022-4487, 2022-5849, 2022-3510	
71111.15	Procedures	0PSP03-RA-8033	Containment Radiation Monitoring System Valve Operability Test	11
71111.15	Work Orders	Work Authorization Number	642221, 651211	
71111.19	Corrective Action Documents	CR-YYYY-NNNN	2022-4077, 2022-4273, 2022-5692, 2022-5891	
71111.19	Procedures	0POP02-CW-0001	Circulating Water System Pump Operation	93
71111.19	Work Orders	Work Authorization Number	637187, 621928, 629916, 616134, 602538, 669465, 621864, 542200, 638625	
71111.22	Corrective Action Documents	CR-YYYY-NNNN	2022-4892, 2022-5108	
71111.22	Procedures	0PSP03-SI-0017	Containment Spray Valve Checklist	7
71111.22		0PSP03-DG-0017	Standby Diesel 12(22) Twenty-Four Hour Load Test	59
71111.22		0PSP03-EW-0018	Essential Cooling Water System Train B Testing	59
71111.22		0PSP03-SI-0014	ECCS Valve Checklist	21
71111.22		0PSP03-AF-0007	Auxiliary Feedwater Pump 14(24) Inservice Test	60
71111.22	Work Orders	Work Authorization Number	640797	
71114.06	Procedures	0ERP01-ZV-IN01	Emergency Classification	11
71114.06	Procedures	0ERP01-ZV-IN02	Notifications to Offsite Agencies	36
71114.06	Procedures	0POP05-EO-E000	Reactor Trip or Safety Injection	26
71114.08	Miscellaneous	NOC-AE-22003893	South Texas Project Units 1 and 2; Docket Nos. STN 50-498, STN 50-499; 2022 NRC/FEMA Evaluated Exercise Scenario Manual	05/18/2022
71114.08	Procedures	0ERP01-ZV-IN01	Emergency Classifications	11
71114.08	Procedures	0ERP01-ZV-IN07	Offsite Protective Action Recommendations	18
71151	Procedures	0PAP01-ZA-0101	Plant Procedure Writer's Guide	8

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71151	Procedures	0PGP03-ZA-0010	Performing and Verifying Station Activities	41
71151	Procedures	0PGP03-ZA-0090	Work Process Program	44
71151	Procedures	0PGP05-ZN-0007	Preparation and Submittal of NRC Performance Indicators	9
71152	Corrective Action Documents	CR-YYYY-NNNN	2020-5599, 2020-6310, 2020-6368, 2020-7507, 2021-6580, 2021-8442, 2021-8518, 2021-12337, 2021-12450, 2022-451, 2022-452, 2022-453, 2022-498, 2022-499, 2022-721, 2022-784, 2022-5508, 2022-5509, 2022-5514, 2022-5533, 2022-5632, 2022-5659, 2022-5715, 2022-5723, 2022-5728	