



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

November 2, 2017

Mr. G. T. Powell
Executive Vice President and
Chief Nuclear Officer
STP Nuclear Operating Company
P.O. Box 289
Wadsworth, TX 77483

SUBJECT: SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION – NRC
INTEGRATED INSPECTION REPORT 05000498/2017003 AND
05000499/2017003

Dear Mr. Powell:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your South Texas Project Electric Generating Station, Units 1 and 2, facility. On October 5, 2017, 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.

The NRC inspectors did not identify any finding or violation of more than minor significance.

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,

/RA/

Nicholas H. Taylor, Branch Chief
Project Branch B
Division of Reactor Projects

Docket Nos.: 50-498 and 50-499
License Nos.: NPF-76 and NPF-80

Enclosure:
Inspection Report 05000498/2017003
and 05000499/2017003
w/ Attachments:
1. Supplemental Information
2. Request for Information

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION – NRC INTEGRATED
INSPECTION REPORT 05000498/2017003 AND 05000499/2017003 NOVEMBER 2, 2017
OCTOBER

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ADAMS ACCESSION NUMBER: ML17311A653

SUNSI Review: By:DLP/dll
 ADAMS: Yes No
 Non-Publicly Available
 Publicly Available
 Non-Sensitive
 Sensitive
 Keyword: NRC-002

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000498; 05000499

License: NPF-76; NPF-80

Report: 05000498/2017003; 05000499/2017003

Licensee: STP Nuclear Operating Company

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

Location: FM 521 - 8 miles west of Wadsworth
Wadsworth, Texas 77483

Dates: July 1 through September 30, 2017

Inspectors: A. Sanchez, Senior Resident Inspector
N. Hernandez, Resident Inspector
R. Azua, Senior Reactor Inspector
H. Freeman, Senior Reactor Inspector
J. Josey, Senior Resident Inspector
J. Melfi, Project Engineer
J. Rollins, Senior Physical Security Inspector

Approved By: Nicholas H. Taylor
Chief, Project Branch B
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000498/2017003, 05000499/2017003; 07/01/2017 – 09/30/2017; South Texas Project Electric Generating Station, Units 1 and 2; Integrated Inspection Report

The inspection activities described in this report were performed between July 1 and September 30, 2017, by the resident inspectors at the South Texas Project and inspectors from the NRC's Region IV office. The significance of inspection findings is indicated by their color (i.e., Green, greater than Green, White, Yellow, or Red), determined using Inspection Manual Chapter 0609, "Significance Determination Process," dated April 29, 2015. Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014. Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," dated July 2016.

No findings were identified.

PLANT STATUS

Unit 1 and Unit 2 began the inspection period at 100 percent power and remained there for the entire inspection period.

On August 25, 2017, Hurricane Harvey, a category four hurricane, made landfall in Rockport, Texas, approximately 100 miles west of the site. Both units maintained full power operations through the storm. The NRC Region IV office dispatched four inspectors to the South Texas Project to oversee licensee response and actions to the storm, and were physically sequestered inside the protected area from August 25 through September 2, 2017.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

On August 10, 2017, the inspectors completed an inspection of the station's readiness for impending adverse weather conditions. The inspectors reviewed plant design features, the licensee's procedures to respond to high winds due to a tornado spotted on the owner controlled area, and the licensee's implementation of these procedures. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant.

On August 25, 2017, the inspectors completed an inspection of the station's readiness for impending adverse weather conditions. The inspectors reviewed plant design features, the licensee's procedures to respond to high winds, tropical storms, and hurricanes (Harvey), and the licensee's implementation of these procedures. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant.

These activities constituted two samples of readiness for impending adverse weather conditions, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walk-Down

a. Inspection Scope

The inspectors performed partial system walk-downs of the following risk-significant systems:

- July 20, 2017, Unit 1, train B essential cooling water while train A essential cooling water was out of service for emergent maintenance
- July 24, 2017, Unit 1, train A essential cooling water while train B essential cooling water was out of service for planned maintenance
- August 8, 2017, Unit 1, train C emergency diesel generator while the train D turbine-driven auxiliary feedwater pump was out of service for planned maintenance
- August 14, 2017, Unit 1, train C essential cooling water systems while train A essential cooling water system was out of service for planned maintenance
- August 31, 2017, Unit 1 and Unit 2, main cooling reservoir following Hurricane Harvey

The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the systems. They visually verified that critical portions of the systems and trains were correctly aligned for the existing plant configuration.

These activities constituted five partial system walk-down samples, as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

.2 Complete Walk-Down

a. Inspection Scope

On July 27, 2017, the inspectors performed a complete system walk-down inspection of the Unit 2, train A auxiliary feedwater system. The inspectors reviewed the licensee's procedures and system design information to determine the correct auxiliary feedwater system lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, in-process design changes, temporary modifications, and other open items tracked by the licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

These activities constituted one complete system walk-down sample, as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Quarterly Inspection

a. Inspection Scope

The inspectors evaluated the licensee's fire protection program for operational status and material condition. The inspectors focused their inspection on five plant areas important to safety:

- July 17, 2017, make-up demineralizer building, Fire Area 99, Fire Zone Z920
- July 20, 2017, Unit 2, auxiliary feedwater pump rooms, trains A, B, C, and D; Fire Areas 48, 49, 50, and 51, Fire Zones Z400, Z401, Z402, and Z403
- July 21, 2017, Unit 2, electrical auxiliary building, train B 125 Vdc battery room, Fire Area 02, Fire Zone Z002
- July 24, 2017, Unit 1, electrical auxiliary building motor generator room, Fire Area 04, Fire Zone Z054
- July 25, 2017, Unit 2, turbine generator building, 13.8 kV switchgear room and cable vault, Fire Area 90, Fire Zone Z710

For each area, the inspectors evaluated the fire plan against defined hazards and defense-in-depth features in the licensee's fire protection program. The inspectors evaluated control of transient combustibles and ignition sources, fire detection and suppression systems, manual firefighting equipment and capability, passive fire protection features, and compensatory measures for degraded conditions.

These activities constituted five quarterly inspection samples, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

.2 Annual Inspection

a. Inspection Scope

On August 21, 2017, the inspectors completed their annual evaluation of the licensee's fire brigade performance. This evaluation included observation of two fire drills:

- July 12, 2017, unannounced drill, fire in the Unit 1, train A cable spreading room coupled with a personnel injury
- August 2, 2017, announced drill, fire in the Unit 2, train B emergency diesel generator control panel due to the A phase overcurrent breaker overheating

During these drills, the inspectors evaluated the capability of the fire brigade members, the leadership ability of the brigade leader, the brigade's use of turnout gear and

fire-fighting equipment, and the effectiveness of the fire brigade's team operation. The inspectors also reviewed whether the licensee's fire brigade met NRC requirements for training, dedicated size and membership, and equipment.

These activities constituted one annual inspection sample, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

On August 1, 2017, the inspectors completed an inspection of the station's ability to mitigate flooding due to internal causes. After reviewing the licensee's flooding analysis, the inspectors choose two plant areas containing risk-significant structures, systems, and components (SSCs) that were susceptible to flooding:

- Unit 1, auxiliary feedwater pump rooms
- Unit 2, auxiliary feedwater pump rooms

The inspectors reviewed plant design features and licensee procedures for coping with internal flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether operator actions credited for flood mitigation could be successfully accomplished.

In addition, on September 28, 2017, the inspectors completed an inspection of underground vaults susceptible to flooding, to observe their condition following Hurricane Harvey. The inspectors selected seven underground vaults that contained risk-significant or multiple-train cables whose failure could disable risk-significant equipment:

- Unit 1, train A, A0XYAB KEM53
- Unit 1, train B, B0XYAB KEM52
- Unit 1, train C, C0XYAB KEM52
- Unit 1, train C, C0XYAB KEM51
- Unit 2, train B, B0XYAB KEM55
- Unit 2, train B, B0XYAB KEM56
- Unit 2, auxiliary feedwater storage tank valve pit

The inspectors observed the material condition of the cables and splices contained in the underground vaults and looked for evidence of cable degradation due to water intrusion. The inspectors verified that the cables and vaults met design requirements.

These activities constituted completion of one flood protection measures sample and one bunker/manhole sample, as defined in Inspection Procedure 71111.06.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

On September 21, 2017, the inspectors completed an inspection of the readiness and availability of risk-significant heat exchangers. The inspectors observed performance tests for the Unit 1, trains A, B, and C component cooling water heat exchangers and reviewed the data from a performance test for these heat exchangers. Additionally, the inspectors walked down the Unit 1 component cooling water heat exchangers to observe its performance and material condition, and verified that they were correctly categorized under the Maintenance Rule and was receiving the required maintenance.

These activities constituted completion of one heat sink performance annual review sample, as defined in Inspection Procedure 71111.07.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

.1 Review of Licensed Operator Requalification

a. Inspection Scope

On July 19, 2017, the inspectors observed simulator training for an operating crew. The inspectors assessed the performance of the operators and the evaluators' critique of their performance.

These activities constituted completion of one quarterly licensed operator requalification program sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

On August 9, 2017, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was in a period of heightened risk due to maintenance on the letdown heat exchanger outlet temperature controller, CC-TV-4494, which required manual control of letdown temperature.

In addition, the inspectors assessed the operators' adherence to plant procedures, including the conduct of operations procedure and other operations department policies.

These activities constituted completion of one quarterly licensed operator performance sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

Routine Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed two instances of degraded performance or condition of safety-significant SSCs:

- August 17, 2017, Unit 1 and Unit 2, auxiliary feedwater systems
- August 28, 2017, Unit 2, pressurizer pressure backup heater breaker for group 2A following a failure to open

The inspectors reviewed the extent of condition of possible common cause SSC failures and evaluated the adequacy of the licensee's corrective actions. The inspectors reviewed the licensee's work practices to evaluate whether these may have played a role in the degradation of the SSCs. The inspectors assessed the licensee's characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

These activities constituted completion of two maintenance effectiveness samples, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed two risk assessments performed by the licensee prior to changes in plant configuration and the risk management actions taken by the licensee in response to elevated risk:

- August 7, 2017, Unit 1, planned maintenance on auxiliary feedwater pump 14 to lubricate, clean, and inspect the terry turbine and auxiliary feedwater regulating valve
- September 17, 2017, Unit 2, planned maintenance work week in which the emergency transformer was out of service from Hurricane Harvey

The inspectors verified that these risk assessments were performed timely and in accordance with the requirements of 10 CFR 50.65 (the Maintenance Rule) and plant procedures. The inspectors reviewed the accuracy and completeness of the licensee's

risk assessments and verified that the licensee implemented appropriate risk management actions based on the result of the assessments.

The inspectors also observed portions of three emergent work activities that had the potential to affect the functional capability of mitigating systems:

- July 19, 2017, Unit 1, emergent maintenance for a ground on train A essential cooling water pump discharge valve 0121
- July 24 through August 20, 2017, Unit 2, emergent maintenance to rebuild centrifugal charging pump 2B due to high pump vibrations
- August 18, 2017, Unit 2, emergent maintenance on train B, qualified display processing system to repair a failed self-health card, which required entry into the licensee's Configuration Risk Management Program

The inspectors verified that the licensee appropriately developed and followed a work plan for these activities. The inspectors verified that the licensee took precautions to minimize the impact of the work activities on unaffected SSCs.

The inspectors also reviewed the licensee's action for implementing the Configuration Risk Management Program for determining and implementing the risk-informed allowed outage time for the emergent maintenance to repair the qualified display processing system, in Unit 2, on August 18, 2017.

These activities constituted completion of five maintenance risk assessments and emergent work control inspection samples, as defined in Inspection Procedure 71111.13.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed eight operability determinations that the licensee performed for degraded or nonconforming SSCs:

- July 26, 2017, operability determination of Unit 1 solid state protection system following failure of one of two 15 Vdc power supplies in logic cabinet R
- August 8, 2017, operability determination of the Unit 1 reactor coolant leak detection system following the containment normal sump discharge flow totalizer meter giving a false indication of a rising level in the sump
- September 1, 2017, operability determination of the Unit 1 and Unit 2 emergency diesel generator flood panels that exhibited leakage during heavy rains associated with Hurricane Harvey

- September 15, 2017, operability determination of the Unit 2, train B reactor containment fan cooler (21B) due to a failure of the backdraft damper failing to close
- September 19, 2017, operability determination of Unit 2, train D 125 volt Class 1E battery due to corrosion identified on 16 cells
- September 20, 2017, operability determination of the Unit 1, train B reactor containment fan cooler (12B) due to a failure of the backdraft damper to fully close
- September 20, 2017, operability determination of Unit 2, train B qualified display processing system cabinet due to a broken door handle following maintenance
- September 27, 2017, operability determination of Unit 2, train C degraded automatic recirculation valve flange due to corrosion

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded SSC to be operable, the inspectors verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of operability. The inspectors verified that the licensee had considered the effect of other degraded conditions on the operability of the degraded SSC.

These activities constituted completion of eight operability review samples, as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed eight post-maintenance testing activities that affected risk-significant SSCs:

- July 27, 2017, Unit 2, pressurizer heater backup group 2A supply breaker following breaker replacement
- August 7, 2017, Unit 1, main generator circuit breaker following solenoid and air regulating valve replacement
- August 8, 2017, Unit 1, train D auxiliary feedwater pump following preventative maintenance
- August 8, 2017, Unit 1, steam generator 1D power operated relief valve following preventative maintenance

- August 20, 2017, Unit 2, centrifugal charging pump 2B following corrective maintenance to replace the pump rotating element
- August 21, 2017, Unit 2, train B qualified display processing system following replacement of the communications board
- September 1, 2017, Unit 1, train A low head safety injection following corrective maintenance to replace a failed breaker
- September 9, 2017, Unit 2, train C auxiliary feedwater pump following corrective maintenance to replace a failed 3A auxiliary relay

The inspectors reviewed licensing- and design-basis documents for the SSCs and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected SSCs.

These activities constituted completion of eight post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed five risk-significant surveillance tests and reviewed test results to verify that these tests adequately demonstrated that the SSCs were capable of performing their safety functions:

In-service tests:

- July 20, 2017, Unit 2, train D turbine-driven auxiliary feedwater pump
- August 10, 2017, Unit 1, train D turbine-driven auxiliary feedwater pump

Other surveillance tests:

- July 26, 2017, Unit 1, train B emergency diesel generator surveillance test
- August 1, 2017, Unit 2, train B emergency diesel generator surveillance test
- September 8, 2017, Unit 2, train B reactor containment fan cooler backdraft damper test

The inspectors verified that these tests met technical specification requirements, that the licensee performed the tests in accordance with their procedures, and that the results of the test satisfied appropriate acceptance criteria. The inspectors verified that the licensee restored the operability of the affected SSCs following testing.

These activities constituted completion of five surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security

4OA1 Performance Indicator Verification (71151)

.1 Safety System Functional Failures (MS05)

a. Inspection Scope

For the period of April 2016 through May 2017, the inspectors reviewed licensee event reports, maintenance rule evaluations, and other records that could indicate whether safety system functional failures had occurred. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, and NUREG-1022, "Event Reporting Guidelines: 10 CFR 50.72 and 50.73," Revision 3, to determine the accuracy of the data reported.

These activities constituted verification of the safety system functional failures performance indicator for Unit 1 only, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index: High Pressure Injection Systems (MS07)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of July 2016 through June 2017 to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for high pressure injection systems for Units 1 and 2, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index: Heat Removal Systems (MS08)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of July 2016 through June 2017 to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for heat removal systems for Unit 2 only, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.4 Reactor Coolant System Specific Activity (BI01)

a. Inspection Scope

The inspectors reviewed the licensee's reactor coolant system chemistry sample analyses for the period of April 2016 through May 2017 to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the reactor coolant system specific activity performance indicator for Unit 1 only, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.5 Reactor Coolant System Identified Leakage (BI02)

a. Inspection Scope

The inspectors reviewed the licensee's records of reactor coolant system identified leakage for the period of April 2016 through May 2017 to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the reactor coolant system leakage performance indicator for Unit 1 only, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

Throughout the inspection period, the inspectors performed daily reviews of items entered into the licensee's corrective action program and periodically attended the licensee's condition report screening meetings. The inspectors verified that licensee personnel were identifying problems at an appropriate threshold and entering these problems into the corrective action program for resolution. The inspectors verified that the licensee developed and implemented corrective actions commensurate with the significance of the problems identified. The inspectors also reviewed the licensee's problem identification and resolution activities during the performance of the other inspection activities documented in this report.

b. Findings

No findings were identified.

.2 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors selected one issue for an in-depth follow-up:

- On September 28, 2017, the inspectors completed a review of an NRC-identified transient combustible issue in the fuel handling building, associated with the emergency core cooling systems common penetration space. The licensee was previously tracking the transient combustibles in accordance with site Procedure OPGP03-ZF-0019, "Control of Transient Fire Loads and Use of Combustible and Flammable Liquids and Gases," Revision 14, but had not included the material in the appropriate appendix following implementation of OPGP03-ZF-0019, "Control of Transient Fire Loads and Use of Combustible and Flammable Liquids and Gases," Revision 15. The inspectors reviewed the fire hazards analysis and toured other areas of the site to evaluate the extent of condition.

The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews and compensatory actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to correct the condition.

These activities constituted completion of one annual follow-up sample, as defined in Inspection Procedure 71152.

b. Findings

No findings were identified.

.3 2016 Problem Identification and Resolution Follow-up Inspection (71152B)

a. Inspection Scope

From August 7 through 9, 2017, the NRC conducted a follow-up inspection to evaluate the effectiveness of the licensee's corrective actions, to address the chilled work environment within the South Texas Project (STP) security department. The chilled work environment was first documented in NRC Inspection Report 05000498/2016009; 05000499/2016009, when inspectors found a significant number of security officers that shared a perception that the raising of nuclear safety or security concerns to their employer, or the NRC, was being suppressed or discouraged.

During this inspection, the NRC interviewed approximately 50 members of the G4S Regulated Security Solutions (RSS) contract security force, including four lieutenants, during focus groups and individual interviews. The inspectors also met with licensee management to discuss the corrective actions that had been taken to address the chilled work environment in the STP security department. Finally, the inspectors met with the STP employee concerns program and G4S "Safe to Say" personnel in order to assess the effectiveness of these programs, and to identify the volume and types of concerns that were being raised using these avenues.

Since the chilled work environment was identified by the NRC, the licensee had made several personnel changes in security management, at the site, in both the STP organization and the G4S/RSS organization. The licensee trained all security officers regarding expectations for establishing and maintaining a safety conscious work environment, and trained them in the use of the corrective action program software. Finally, the licensee had made progress in hiring and training new security officers to address security overtime and scheduling issues, and had developed a strategic plan to address the condition of the bullet resistant enclosures and response post facilities at the site. With regard to the bullet resistant enclosures and individual response post facilities, the licensee had already replaced the air conditioners, improved their cleanliness, and replaced the chairs.

Interviews with security officers revealed that the morale within the security organization had improved. The officers were aware of the management changes that had occurred and indicated that the new managers seemed to be interested in correcting adverse working conditions that had existed for some time. However, this was tempered by the fact that they felt it was too soon to conclude whether management was committed to the changes over the long term. All of the officers interviewed indicated a willingness to see if these new STP and G4S/RSS managers would be able to effect change, but were reserving judgement on their effectiveness.

In conclusion, the inspectors noted that the licensee had taken several actions to address the underlying problems that were causing the chilled work environment in the STP security department. The inspectors determined, based upon interviews, that security personnel felt comfortable raising nuclear and non-nuclear safety concerns without the fear of retaliation, and with a greater degree of confidence that their concerns would be addressed. The inspectors concluded that the licensee's corrective actions had been effective in addressing the chilled work environment in the security department. However, the inspectors concluded that continued management attention

and follow through with the corrective action plan is needed to ensure that the safety conscious work environment in the security department continues to improve.

b. Findings

No findings were identified.

40A3 Follow-up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report 05000498/2016-002-00: Unit 1 Automatic Reactor Trip and Auxiliary Feedwater System Actuation Following Turbine Trip due to Generator Lockout

On May 1, 2016, Unit 1 tripped due to a main generator lockout that ultimately resulted in an automatic turbine trip and an automatic reactor trip. The licensee discovered a deteriorated rubber boot where the main generator phase B enter the isophase bus duct. This degraded protective boot separated and a piece was hanging down and intermittently contacting the generator bushing causing a resistance path to ground, main generator lockout, and turbine trip. The automatic trip was uncomplicated.

The licensee entered the issue into their corrective action program as Condition Report 2016-6008. As part of their corrective actions, the licensee replaced the boot seals on all three phases from the main generator. The licensee determined that the design of the boot seal was less than adequate and implemented Design Change Package 16-6008 to improve the design. During the following Unit 2 Refueling Outage, fall 2016, the boot seals on all three phases from the main generator were replaced.

The inspectors reviewed the licensee event report and related documents regarding the accuracy of the licensee event report and the appropriateness of corrective actions. The inspectors determined the licensee's actions were adequate and appropriate. The licensee event report was reviewed and no findings or violations of NRC requirements were identified. Licensee Event Report 05000498/2016-002-00 is closed.

.2 (Closed) Licensee Event Report 05000498/2015-001-00: Unit 1 Manual Reactor Trip due to Lowering Steam Generator Levels and Valid Auxiliary Feedwater System Actuation Following a Manual Main Turbine Trip

On December 21, 2015, while at approximately 48 percent reactor power and ascending following a refueling outage, Unit 1 operators manually tripped the main turbine due to excessive load swings caused by main turbine governor valve 2 oscillations. The steam dump system initially responded correctly prior to the turbine trip, but then the group one steam dumps failed to operate. The steam dump issue led to a main feedwater isolation due to rising steam generator levels. Operators initiated a manual reactor trip due to lowering steam generator levels. The lowering steam generator level in steam generator A was the result of a steam generator blowdown isolation valve that failed to fully isolate in the main feedwater isolation.

The licensee entered the issue into their corrective action program as Condition Reports 2015-26702, 2015-26719, and 2015-26734. Troubleshooting discovered an intermittent ground on the linear variable differential transmitter (LVDT) caused by a small score in the insulation of the LVDT signal wiring. The spring clips in the group one

steam dump positioner became dislodged due to the violent and rapid demands created by the governor valve swings. The steam generator A blowdown valve failed to fully close due to a closing spring issue. All three of these conditions were resolved prior to reactor start-up and include: complete replacement of the degraded LVDT wire for governor valve 2 and inspection and testing of the other wiring in the other throttle and governor valves, reinstallation of the positioner spring clips and tolerances verified in all steam dumps, and the replacement of the degraded spring in the steam generator A blowdown valve.

The inspectors reviewed the licensee event report and related documents regarding the accuracy of the licensee event report and the appropriateness of corrective actions. The inspectors determined the licensee's actions were adequate and appropriate. The licensee event report was reviewed and no findings or violations of NRC requirements were identified. Licensee Event Report 05000498/2015-001-00 is closed.

These activities constituted completion of two event follow-up samples, as defined in Inspection Procedure 71153

40A6 Meetings, Including Exit

Exit Meeting Summary

On August 10, 2017, regional inspectors presented the Problem Identification and Resolution Follow-up Inspection results to Mr. D. Koehl, President and Chief Executive Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On October 5, 2017, the resident inspectors presented the inspection results to Mr. G. Powell, Executive Vice President and Chief Nuclear Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

D. Abell, Supervisor, Security
R. Aguilera, Manager, Plant Protection/Emergency Response
E. Bernard, G4S/RSS "Safe 2 Say" Representative
J. Berrio, Manager, Operations, Production Support & Programs
J. Bodnar, Manager, Security
C. Bowman, Manager, Nuclear Support
W. Brost, Engineer III
A. Capristo, Executive Vice President and Chief Administrative Officer
R. Cink, Investigator, Employee Concerns Program
J. Connolly, Site Vice President
R. Dunn Jr., Manager, Nuclear Fuel and Analysis
S. Eland, RSS Project Manager
R. Engen, Manager, Design Engineering
S. Flaherty, Manager, Staff Support and Owner Liaison
T. Frawley, Manager, Corporate Projects
C. Gann, Manager, Employee Concerns Program
R. Gibbs, Manager, Operations Division, Unit Operations
R. Gonzales, Senior Licensing Engineer
G. Hildebrandt, Manager, Training
G. Janak, Operations Training Manager
B. Jefferson, Director, Operations
D. Koehl, President and CEO
B. Lane, Manager, Operations Division, Integrated Work Management & Outage
J. Lovejoy, Manager, I&C Maintenance
E. Matejcek, Manager, Mechanical Maintenance
R. McNeil, Manager, Maintenance Engineering
J. Mertink, Manager, Nuclear Oversight
M. Murray, Manager, Regulatory Affairs
M. Page, General Manager, Engineering
C. Pence, Manager, Chemistry
L. Peter, General Manager, Projects
G. Powell, Executive Vice President and Chief Nuclear Officer
D. Rencurrel, Senior Vice President, Operations
M. Ruvalcaba, Manager, Strategic Projects
R. Savage, Engineer, Licensing Consult Specialist
R. Scarborough, Manager, Operations Training Mentor
M. Schaefer, Plant General Manager
R. Stastny, Maintenance Manager
L. Sterling, Supervisor, Licensing
C. Stone, Manager, Health Physics
J. Von Suskil, Owner Rep – NRG South Texas LP
K. Wallis, Manager, Systems/Testing and Programs Engineering
D. Young, G4S Director
D. Zink, Supervising Engineering Specialist

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

05000498/2016-002-00	LER	Unit 1 Automatic Reactor Trip and Auxiliary Feedwater System Actuation Following Turbine Trip due to Generator Lockout (4OA3.1)
05000498/2015-001-00	LER	Manual Reactor Trip due to Lowering Steam Generator Levels and Valid Auxiliary Feedwater System Actuation Following a Manual Main Turbine Trip (4OA3.2)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Condition Reports (CRs)

17-19852 17-19876 17-19971

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OPGP03-ZV-0001	Severe Weather Plan	21
0POP04-ZO-0002	Natural or Destructive Phenomena Guidelines	54
OPGP03-ZV-0006	Main Cooling Reservoir Emergency Action Plan	0
0POP02-MC-0001	Cooling Water Reservoir Spillway Gates and Blowdown Operation	12

Section 1R04: Equipment Alignment

Condition Reports (CRs)

17-18919	16-8818	16-15346	16-12833	16-15840
16-15532	16-15533	16-15251	16-9466	16-15261
15-14731	16-9893	17-16760	17-18794	17-17314
17-17332	17-14249	17-16446	17-17819	16-8348
16-14637	17-13408	17-15636	17-15719	17-12373
16-16014	16-8375	16-12830	16-14167	17-19803
17-19804	17-19985	17-19997	17-19998	17-19999
17-20000	17-20001			

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
5R289F05038	Essential Cooling Water System	21

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0POP02-AF-0001	Auxiliary Feedwater	46
0POP02-DG-0003	Emergency Diesel Generator 13(23)	69
0POP02-EW-0001	Essential Cooling Water Operations	73

Section 1R05: Fire Protection

Condition Reports (CRs)

17-19203

Fire Drill Numbers

17-03-01 17-02-04 17-02-06 17-03-02

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0DMB99-FP-0920	Fire Preplan for Make-up Demineralizer Building	2
0EAB02-FP-0002	Fire Preplan for Electrical Auxiliary Building Channel II Battery Room	3
0EAB04-FP-0054	Fire Preplan for Electrical Auxiliary Building	3
0IVC49-FP-0400	Fire Preplan Isolation Valve Cubicle Pump Room Train D	2
0IVC49-FP-0401	Fire Preplan Isolation Valve Cubicle Pump Room Train A	3
0IVC49-FP-0402	Fire Preplan Isolation Valve Cubicle Pump Room Train B	4
0IVC49-FP-0403	Fire Preplan Isolation Valve Cubicle Pump Room Train C	4
0PGP03-ZF-0011	STPEGS Fire Brigade	17
0TGB90-FP-0710	Fire Preplan for Turbine Generator Building 13.8KV Switchgear Room and Cable Vault	4

Section 1R06: Flood Protection Measures

Condition Reports (CRs)

12-11658 17-21218 17-21221 17-21222 17-21224

Design Change Notice (DCN)

10-12418

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
5E100E02100	Electrical Class 1E General Arrangement Station Underground Duck Banks	26
3P110C05034	Concrete Class 1E Underground Electrical Raceway Sys. Manhole	14
5E100E02100	Electrical Class 1E General Arrangement Station Underground Duct Banks	26
3P110C05034	Concrete Class 1E Underground Electrical Raceway Sys. Manhole Plan. Sect. & Det. Unit No. 1 & 2	14

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
Calc MC5557	IVC Flooding Analysis	9

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OPGP04-ZA-0307	Preparation of Calculations	7
OPMP05-MH-0001	Manhole Controls Procedure	3
MEG-0101	Penetration Seals	1

Work Authorization Numbers

553153 553146 555931 553151 553142
553152

Section 1R07: Heat Sink Performance

Condition Reports (CRs)

08-7910 10-15780

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0PEP07-EW-0001	Performance Test For Essential Cooling Water Heat Exchangers	8

Work Authorization Number

519596

Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance

Condition Reports (CRs)

17-16588

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
RST 217.20	Open Loop Rupture Scenario	0
LOR 173.08	Addendum 1 Simulator Guide	
0POP02-CV-0004	Chemical and Volume Control System Subsystem	87

Section 1R12: Maintenance Effectiveness

Condition Reports (CRs)

16-15840	16-15532	16-15533	16-15251	17-16760
17-18794	17-17314	17-17332	17-14249	17-16446
17-17819	17-17819	16-8348	17-15182	16-15251
16-9466	16-15261	16-14731	16-13145	16-15532
16-9893	16-14637	16-14230	17-13408	17-13269
17-15636	17-15719	17-12373	17-16223	16-16014
17-18175	16-3503			

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Maintenance Rule Expert Panel Meeting Agenda	August 19, 2017
51-9275786-001	AREVA Engineering Information Record	August 30, 2017

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
SEG-0009	Maintenance Rule Basis Document Guideline	2
OPGP04-ZE-0313	Maintenance Rule Program	7

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Condition Reports (CRs)

17-18814 17-20124

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
9E0EW04 #1, Sheet 1	Elementary Diagram Essential Cooling Water Pumps 1A, 1B & 1C	19
9E0EW04 #1, Sheet 2	Elementary Diagram Essential Cooling Water Pumps – Trains A, B & C Discharge MOV's 0121, 0137, & 0151	12

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OPGP03-ZO-0055	Protected Components	11
0POP01-ZO-0006	Risk Management Actions	24
0PSP03-EW-0017	Essential Cooling Water System Train A Testing	37
OPGP03-ZA-0091	Configuration Risk Management Program	13
OPGP03-ZG-RMTS	Risk-Managed Technical Specifications Program	2
OPGP05-ZE-0001	PRA Analyses/Assessments	3

RICTCAL/RASCAL Sequence Number

2999 2991 3018 3013 2983

Work Authorization Numbers

569033 529088 533470

Section 1R15: Operability Determinations and Functionality Assessments

Condition Reports (CRs)

15-26632	17-19141	17-18999	17-20135	06-9513
06-9461	04-9630	17-20882	17-19073	16-5535
17-20423	17-20435	17-20436		

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
VTD-W351-0061	Three Train Solid State Protection System (TTSSPS) Technical Manual	2
WCAP-8687	Plant Safety Monitoring System (Seismic and Environmental Testing)	March 1983

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0PSP06-DJ-0001	125 Volt Class 1E Battery Monthly Surveillance Test	36
0PSP06-DJ-0002	125 Volt Class 1E Battery Quarterly Surveillance Test	29

Section 1R19: Post-Maintenance Testing

Condition Reports (CRs)

17-18175	17-19295	17-19174	05-1877	17-19752
17-20947	17-20682	17-19606	17-20444	17-14594

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
5R179F05007#2	Chemical and Volume Control System	52
500-N0013231	Pump Assembly	2

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
VTD-P025-0002	Centrifugal Charging Pump (CCP) Operation and Maintenance Manual	9

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0PMP07-AM-0021	QDPS APC B-1 Removal from Service	16
0POP02-CV-0004	Chemical and Volume Control System Subsystem	87
0POP11-CV-0002	Centrifugal Charging Pump 1B(2B) Online Isolation and Restoration	6
0PSP03-SP-009A	SSPS Actuation Train A Slave Relay Test	43
2PSP03-CV-0013	Centrifugal Charging Pump 2B Reference Valves Measurement	0
0PMP05-ZE-0108	Type AR Auxiliary Relay – Maintenance	4
0PSP03-AF-0003	Auxiliary Feedwater Pump 13(23) Inservice Test	38
0PSP03-AF-0007	Auxiliary Feedwater Pump 14(24) Inservice test	49
0PMP04-AF-0003	Auxiliary Feedwater Turbine Trip Throttle Valve Maintenance	31
0PMP04-CV-0003	Centrifugal Charging Pump Maintenance	25
0POP02-AE-0002	Transformer Normal Breaker and Switch Lineup	68
0POP01-ZA-0021	AC Electrical Notes and Precautions	18
0POP09-AN-0001	Main Generator Breaker Local Annunciator Lampbox 1(2)-001 Response Instructions	12
0PSP03-MS-0001	Main Steam System Valve Operability Test	48
0POP01-ZA-0001	Plant Operations Department Administrative Guidelines	50
0PSP03-SP-0008C	SSPS Train C Quarterly Slave Relay Test	24

Work Authorization Numbers

570554	572292	529088	570197	566276
569657	554952	570028	570556	571810

Section 1R22: Surveillance Testing

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0POP02-AF-0001	Auxiliary Feedwater	46
0PSP03-AF-0007	Auxiliary Feedwater Pump 14(24) Inservice Test	49
0PSP03-DG-0002	Standby Diesel 12(22) Operability Test	58

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0PSP03-SP-0006S	Train S Reactor Trip Breaker TADOT	34, 35
0PSP03-SP-0005S	SSPS Logic Train S Functional Test	44

Section 40A1: Performance Indicator Verification

Condition Reports (CRs)

16-962

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
SEG-007	Mitigating System Performance Indicator Collection, Processing, and Maintenance of Data	9

Section 40A2: Problem Identification and Resolution

Condition Reports (CRs)

17-18561	17-15261	17-14667	16-9764	16-9853
16-00891	16-05023	16-10971	17-17674	

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
6S109F00018#1	Main Steam	18
5S109F00016#2	Main Steam	34

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0PEP02-FH-0004	Irradiated Fuel Assembly Reconstitution and Inspection	17
0PGP03-ZO-0047	Fuel Assembly and Fuel Insert Transfer Program	15
0PGP03-ZF-0019	Control of Transient Fire Loads and Use of Combustible and Flammable Liquids and Gases	15

Work Authorization Numbers

418260	566756	553935	553937
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Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion

Condition Reports (CRs)

16-6008	12-28709	16-6763	15-26702	15-26734
16-1997	15-26717	15-26719		

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
6S109F00018#1	Main Steam	18
5S109F00016#2	Main Steam	34

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Design Change Package 16-6008-26, Isophase Bus Duct Modification for Unit 1 & Unit 2	February 27, 2017
	Event Notification 51897	May 1, 2016
PMI-EM-GM-0004	Main Generator Grounding Transformer Neutral Bus And Generator Isophase Bus Inspection	

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0PAP01-ZA-0104	Plant Operations Review Committee	13
0PGP03-ZO-0022	Post-Trip Review	10
0POP04-MS-0001	Excessive Steam Demand	13
0PMP08-ZI-0025	Pneumatic/Spring Control Valve or Damper Calibration	40
0POP05-E0-ES01	Reactor Trip Response	27
0POP04-TM-0003	Turbine Trip Below P-9	21
0PSP10-ZG-0003	Shutdown Margin Verification – Modes 3, 4, and 5	13
0PEP07-SG-0005	Steam Generator Water Level Control Test	6

Work Authorization Numbers

533585	530291	530425	530439
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**Request for Information (Third Quarter)
Integrated Inspection Report 2017-003
South Texas Project**

Inspection Report: 05000498/2017003; 05000499/2017003
Inspection Dates: July 1 – September 30, 2017
Inspection Procedure: Integrated Inspection Procedures
Lead Inspector: Alfred Sanchez, Senior Resident Inspector

**Information Requested Prior to June 29, 2017
AUXILIARY FEEDWATER SYSTEM**

The following information should be provided in electronic format (Certrec IMS preferred), to the attention of Alfred Sanchez by **June 29, 2017**, to facilitate the reduction in the items to be selected for a final list during inspection preparation. The specific items selected from the lists shall be available and ready for review on the day indicated in this request. *Please provide requested documentation electronically in “pdf” files, Excel, or other searchable formats, if possible. The information should contain descriptive names, and be indexed and hyperlinked to facilitate ease of use. Information in “lists” should contain enough information to be easily understood by someone who has knowledge of pressurized water reactor technology. If requested documents are large and/or only hard copy formats are available, please inform me and provide subject documentation.

1. A list of auxiliary feedwater (AFW) system licensee contacts with phone numbers.
2. Any pre-existing evaluation or list of AFW system components and associated calculations with low design margins.
3. A list of high risk AFW system maintenance rule systems/components and functions, based on engineering or expert panel judgment.
4. A list of AFW system related operating experience evaluations for the last 3 years.
5. A list of all AFW system time-critical operator actions in procedures.
6. Complete copies of normal operating, abnormal operating, emergency operating, surveillance, and alarm response procedures associated with the AFW system
7. A list of permanent and temporary modifications related to the AFW system sorted by component.
8. A list of current AFW system related “operator work arounds/burdens.”
9. A list of the AFW system design calculations, which provide the design margin information for components.

10. List of AFW system root cause evaluations associated with component failures or design issues initiated/completed in the last 5 years.
11. A list of any AFW system common-cause failures of components in the last 3 years.
12. An electronic copy of the AFW system Design Bases Documents and any open, pending, or recently completed changes. Although not an exhaustive list, please include any open, pending, or recently completed (last 3 years) changes to temporary modifications, permanent modifications, engineering change packages, and/or procedure change packages. Specifically, please include any open, pending, or recently completed changes to emergency operating, abnormal operating, normal operating, alarm response, system alignment, surveillance, or other procedure.
13. An electronic copy of the System Health notebook for the AFW system.
14. A copy of AFW system related audits completed in the last 2 years.
15. A list of AFW system motor operated valves (MOVs) in the program, design margin, and risk ranking.
16. A list of AFW system air operated valves (AOVs) in the valve program, design margin, and risk ranking.
17. AFW system structure, system, and components' maintenance rule category, scoping, unavailability data, unreliability data, functional failure evaluations, (a)(1) determinations, (a)(1) goals, and any supporting basis documentation.
18. Copies of surveillance packages (last four performances) for all four trains of AFW systems on both Units.
19. An Excel spreadsheet of AFW system related probabilistic risk assessment (PRA) human action basic events or risk ranking of operator actions from your site specific PSA sorted by risk achievement worth (RAW) and Fussell-Vesely (FV). Provide copies of your human reliability worksheets for these items.
20. In so far as there are recent or pending changes, please provide an Excel spreadsheet of AFW system related equipment basic events (with definitions), including importance measures sorted by RAW and FV from your internal events PRA. Include basic events with RAW value of 1.3 or greater.
21. In so far as there are recent or pending changes, and if you have an external events or fire PSA model, provide the information requested in items 19-20 for external events and fire, as it relates to the AFW system.
22. In so far as there are recent or pending changes, please provide a copy of the South Texas Project IPEEE changes, if available electronically.