



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
612 EAST LAMAR BLVD, SUITE 400  
ARLINGTON, TEXAS 76011-4125

November 2, 2010

Mr. Edward D. Halpin,  
President and Chief Executive Officer  
STP Nuclear Operating Company  
P.O. Box 289  
Wadsworth, TX 77483

Subject: SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION - NRC INTEGRATED  
INSPECTION REPORT 05000498/2010004 AND 05000499/2010004

Dear Mr. Halpin:

On September 30, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your South Texas Project Electric Generating Station, Units 1 and 2, facility. The enclosed integrated inspection report documents the inspection findings, which were discussed on October 7, 2010, with you and other members of your staff.

The inspections examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents two NRC identified findings of very low safety significance (Green). Both of these findings were determined to involve violations of NRC requirements. Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these findings as noncited violations, consistent with Section 2.3.2.a of the NRC Enforcement Policy. If you contest the violations or the significance of the noncited violations, 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, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the South Texas Project Electric Generating Station, Units 1 and 2, facility. In addition, if you disagree with the crosscutting aspect assigned to any finding 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 Regional Administrator, Region IV, and the NRC Resident Inspector at the South Texas Project Electric Generating Station, Units 1 and 2, facility.

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, and its enclosure, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Wayne Walker, Chief  
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Division of Reactor Projects

Dockets: 50-498  
50-499  
Licenses: NPF-76  
NPF-80

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 05000498, 05000499

License: NPF-76, NPF-80

Report: 05000498/2010004 and 05000499/2010004

Licensee: STP Nuclear Operating Company

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

Location: FM521 - 8 miles west of Wadsworth  
Wadsworth, Texas 77483

Dates: July 1 through September 30, 2010

Inspectors: T. Buchanan, Reactor Inspector  
J. Dixon, Senior Resident Inspector  
B. Tharakan, CHP, Resident Inspector

Approved By: Wayne Walker, Chief, Project Branch A  
Division of Reactor Projects

## SUMMARY OF FINDINGS

IR 05000498/2010004, 05000499/2010004; 07/01/2010 – 09/30/2010; South Texas Project Electric Generating Station, Units 1 and 2, Integrated Resident and Regional Report; Operability Evaluations.

The report covered a 3-month period of inspection by resident inspectors and an in office review announced baseline inspection by a regional based inspector. Two Green noncited violations of very low safety significance were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The crosscutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Cross Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### A. NRC-Identified Findings and Self-Revealing Findings

#### Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green noncited violation of Technical Specification 3.7.4 because the licensee had one independent loop of essential cooling water inoperable for longer than the allowed outage time of 7 days. Specifically, on October 27, 2009, the licensee failed to initiate actions to evaluate and repair a through-wall leak in the 30-inch essential cooling water return line from the Unit 2 train C component cooling water heat exchanger, as required by American Society of Mechanical Engineers Boiler and Pressure Vessel Code, and in accordance with guidance contained in NRC Generic Letter 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping." The inspectors questioned the licensee's reportability review and determined there was firm evidence that the through-wall leak caused the Unit 2 train C essential cooling water system to be inoperable for a period of 11 days instead of 8 days as initially concluded by the licensee. The licensee's corrective actions were: (1) the leak was repaired, (2) a revised licensee event report was submitted, (3) training was provided to personnel performing these evaluations, and (4) procedures were updated to require that these types of evaluations must be performed.

The finding was more than minor because the through-wall leak could have challenged the structural integrity of the piping and it was associated with the Mitigating Systems Cornerstone attribute of configuration control and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors performed the initial significance determination using NRC Inspection Manual 0609, Attachment 0609.04, dated January 10, 2008, "Phase 1



– Initial Screening and Characterization of Findings,” because it affected the Mitigating Systems Cornerstone while the plant was at power, and determined a Phase 2 was required because it involved an actual loss of safety function of a single train. A Region IV senior reactor analyst performed a Phase 2 significance determination and found that the finding was potentially greater than Green. The senior reactor analyst then performed a bounding Phase 3 significance determination and found the finding to be of very low safety significance. The dominant core damage sequences included: seismic initiated loss of offsite power, failure of the essential cooling water train C, failure of the train A and B standby diesel generators, failure to recover offsite power and a standby diesel generator in 4 hours, and an event initiated reactor coolant pump seal loss-of-coolant accident. Remaining mitigation equipment that helped to limit the significance of the finding included the remaining functional essential cooling water trains and the turbine-driven auxiliary feedwater pump. In addition, this finding had human performance crosscutting aspects associated with resources in that the licensee did not ensure that training of personnel about the requirements for properly characterizing Class 3 piping leaks was adequate to assure nuclear safety [H.2(b)](Section 1R15).

- Green. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criteria V, “Instructions, Procedures, and Drawings,” for the failure to follow Procedure 0PGP03-ZO-9900, “Operability Determinations and Functionality Assessments,” Revision 1. On August 4, 2010, the Unit 2 isolation valve cubicle room temperature exceeded 104°F for longer than 8 hours, reached a peak recorded temperature of 109°F. Per Technical Requirements Manual Specification 3.7.13, when the temperature of the isolation valve cubicle exceeds 104°F for longer than 8 hours then an evaluation must be performed to determine continued operability of the affected equipment. The inspectors determined that the previous prompt operability determinations concluded that the maximum recorded temperature had been 108°F and that the time allowed at this temperature was roughly 150 hours. The inspectors’ review of the control room logs determined that both of these conditions were exceeded, 109°F and over 250 hours, therefore, a new prompt operability determination needed to be performed to ensure continued operability of the equipment, not only from an environmental qualification standpoint, but also from a high energy line break accident scenario. The licensee’s corrective actions included performing a new prompt operability determination to ensure continued operability of the affected equipment.

The finding was more than minor because, if left uncorrected, it could have led to a more significant safety concern because systems that may be inoperable may not be recognized and it was associated with the Mitigating Systems Cornerstone attribute of configuration control and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors performed the significance determination using the NRC Inspection Manual 0609, Attachment 0609.04, dated January 10, 2008, “Phase 1 – Initial Screening and Characterization of Findings,” because it

affected the Mitigating Systems Cornerstone while the plant was at power. The finding was determined to be of very low safety significance because it was not a design or qualification deficiency, it did not result in the loss of a system safety function, it did not represent the loss of a single train for greater than technical specification allowed outage time, it did not represent a loss of one or more non-technical specification risk significant equipment for greater than 24 hours, and it did not screen as potentially risk significant due to seismic, flooding, or severe weather. In addition, this finding had human performance crosscutting aspects associated with decision-making in that the licensee did not make safety-significant decisions using a systematic process, specifically, not implementing roles and authorities as designed and obtaining interdisciplinary input and reviews [H.1(a)](Section 1R15).

**B. Licensee-Identified Violations**

Violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers (condition report numbers) are listed in Section 4OA7.

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 100 percent rated thermal power and remained there until August 20 when the unit experienced a turbine/reactor trip during solid state protection system surveillance testing as a result of a human performance error. The unit went critical on August 21, achieved 100 percent rated thermal power on August 23, and essentially remained there for the duration of the inspection period.

Unit 2 began the inspection period at 100 percent rated thermal power and essentially remained there for the duration of the inspection period.

### 1. REACTOR SAFETY

#### Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

#### 1R01 Adverse Weather Protection (71111.01)

##### .1 Readiness for Impending Adverse Weather Conditions

##### a. Inspection Scope

On July 1, 2010, the inspectors reviewed the licensee's overall preparations/protection for thunderstorms with potential tornados and high winds in the vicinity of the facility due to the landfall of Hurricane Alex. The inspectors walked down the transformer yard, protected area, safety injection, and auxiliary feedwater system because their safety-related functions could be affected, or required, as a result of high winds or tornado-generated missiles or the loss of offsite power. The inspectors evaluated the plant staff's preparations against the site's procedures and determined that the staff's actions were adequate. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the UFSAR and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant-specific procedures. The inspectors also reviewed a sample of corrective action program items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the corrective action program in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one readiness for impending adverse weather condition sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings were identified.

.2 Readiness to Cope with External Flooding

a. Inspection Scope

On September 21, 2010, the inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The evaluation included a review to check for deviations from the descriptions provided in the UFSAR for features intended to mitigate the potential for flooding from external factors. As part of this evaluation, the inspectors checked for obstructions that could prevent draining, checked that the roofs did not contain obvious loose items that could clog drains in the event of heavy precipitation, and determined that barriers required to mitigate the flood were in place and operable. Additionally, the inspectors performed an inspection of the protected area to identify any modification to the site that would inhibit site drainage during a probable maximum precipitation event or allow water ingress past a barrier. The inspectors also reviewed the abnormal operating procedure for mitigating the design basis flood to ensure it could be implemented as written. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one external flooding sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings were identified.

**1R04 Equipment Alignments (71111.04)**

Partial Walkdown

a. Inspection Scope

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

- July 30, 2010, Unit 1, component cooling water train C
- September 29, 2010, Unit 1, containment spray system train A
- September 30, 2010, Unit 2, auxiliary feedwater system train B

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could affect the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, technical specification requirements, administrative technical specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could

have rendered the systems incapable of performing their intended functions. The inspectors also inspected accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

**1R05 Fire Protection (71111.05)**

Quarterly Fire Inspection Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- September 25, 2010, Unit 1, qualified display processing system and engineered safety features load sequencer trains A, B, and C, Fire Zones Z017, Z073, and Z072
- September 25, 2010, Unit 2, qualified display processing system and engineered safety features load sequencer trains A, B, and C, Fire Zones Z017, Z073, and Z072
- September 28, 2010, Unit 2, fire area 6, which includes electrical auxiliary building heating, ventilation, and air conditioning equipment room trains A, B, and C, Fire Zones Z061, Z062, and Z063; outside air intake, Fire Zone Z097; equipment removal, Fire Zone Z019; and heating, ventilation, and air conditioning equipment, Fire Zone Z085
- September 30, 2010, Unit 1, fire area 6, which includes electrical auxiliary building heating, ventilation, and air conditioning equipment room trains A, B, and C, Fire Zones Z061, Z062, and Z063; outside air intake, Fire Zone Z097; equipment removal, Fire Zone Z019; and heating, ventilation, and air conditioning equipment, Fire Zone Z085

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four quarterly fire protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

**1R11 Licensed Operator Requalification Program (71111.11)**

a. Inspection Scope

On August 12, 2010, the inspectors observed a crew of licensed operations personnel in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operator performance
- Crew's clarity and formality of communications
- Crew's ability to take timely actions in the conservative direction
- Crew's prioritization, interpretation, and verification of annunciator alarms
- Crew's correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors

- Crew's ability to identify and implement appropriate technical specification actions and emergency plan actions and notifications

The inspectors compared the crew's performance in these areas to pre-established operator action expectations and successful critical task completion requirements.

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

b. Findings

No findings were identified.

**1R12 Maintenance Effectiveness (71111.12)**

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk-significant systems:

- August 18, 2010, Units 1 and 2, standby diesel generators
- September 1, 2010, Units 1 and 2, qualified display processing system
- September 28, 2010, Units 1 and 2, 480 Vac motor control centers

The inspectors reviewed events such as where ineffective equipment maintenance has resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices
- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance
- Charging unavailability for performance
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or -(a)(2)
- Verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1)

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed licensee personnel's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- July 12, 2010, Unit 1, train C component cooling water, standby diesel generator 13, refueling water storage tank, generator stator cooling water filter 12 replacement, and Unit 2 train B auxiliary feedwater and control rod surveillance
- August 5, 2010, Unit 2, large train A work week with an emergent failure of the train B standby diesel generator 22 sequencer resulting in multiple cross train equipment being removed from service and entering the configuration risk management program
- September 3, 2010, Units 1 and 2, large Unit 1 train B work week, and Unit 2 train A work week with solid state protection system train B main feedwater regulating valve gray boot connector inspections/replacements as a result of failed surveillance testing

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable,



to verify risk analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings were identified.

**1R15 Operability Evaluations (71111.15)**

a. Inspection Scope

The inspectors reviewed the following issues:

- August 3, 2010, Units 1 and 2, contaminated system leak testing surveillance tests since June 2008 did not incorporate the leakage correction factor to allow the corrected leakage rate to be compared to the allowed leakage rate
- August 3, 2010, Unit 2, standby diesel generator sequencer B trouble alarm due to inability to auto test during a train A work week which could have resulted in two of three trains being inoperable
- August 30, 2010, Unit 2, new ultrasonic feedwater flow measurement computer with incorrect constants results in exceeding rated thermal power
- September 30, 2010, Unit 2, essential cooling water system train C return line vent valve leak
- September 30, 2010, Unit 2, isolation valve cubicle high temperature

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and UFSAR to the licensee personnel's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five operability evaluations inspection samples as defined in Inspection Procedure 71111.15-05.

b. Findings

See Section 4OA7 for a licensee-identified violation associated with the ultrasonic feedwater flow measurement computer.

.1 Failure to Repair Essential Cooling Water System Leak within the Technical Specification Allowed Outage Time

Introduction. The inspectors identified a Green noncited violation of Technical Specification 3.7.4 because the licensee had one independent loop of essential cooling water inoperable for longer than the allowed outage time of 7 days without taking the required actions. Specifically, on October 27, 2009, the licensee failed to initiate actions to evaluate and repair a through-wall leak in the 30-inch essential cooling water return line from the Unit 2 train C component cooling water heat exchanger, as required by ASME Code, and in accordance with guidance contained in NRC Generic Letter 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping."

Description. On October 27, 2009, a performance technician performing fire protection system testing observed water accumulating on the floor of the Unit 2 mechanical auxiliary building component cooling water heat exchanger room. Further investigation revealed the water was accumulating under the 30-inch essential cooling water system return line from the train C component cooling water heat exchanger. The initial leakage estimate was 60 drops per minute through a pinhole leak at the base of a 1-inch vent valve, EW-0211. Valve EW-0211 was attached to the top side of the 30-inch essential cooling water system return line. The licensee determined that the essential cooling water system train C was operable based on the condition being bounded by a previous engineering evaluation for a similar condition in 2005. The licensee decided to continue to monitor the leak and schedule repairs for the week of January 18, 2010, which was the next scheduled outage week for essential cooling water train C.

On November 23, 2009, operations personnel monitoring the leak reported the leak had grown to three pinhole leaks and estimated the leak rate to be 0.087 gallons per minute. Again, operations made the determination that the essential cooling water system train C was operable and no new operability assessment was needed based on the condition still being bounded by the 2005 engineering evaluation. On December 15, 2009, the leakage had increased to 0.157 gallons per minute. By December 21, 2009, a total of 10 pinhole leaks were observed spraying water out of the 30-inch pipe at a total rate of approximately 0.26 gallons per minute. At this point, operations shut down train C of essential cooling water to avoid further degradation of the pipe and requested a prompt operability review from engineering. The licensee also performed nondestructive evaluation of the pinholes and confirmed a circumferential through-wall crack that measured 3.75 inches inside diameter and 3.25 inches outside diameter. The licensee declared essential cooling water system train C inoperable on December 22, 2009, and

subsequently performed ASME Code repairs to the pipe, restored operability, and returned train C of essential cooling water to service on December 25, 2009.

The licensee conducted a root cause investigation and a reportability review of the event. The exact cause of the crack initiation could not be determined. The likely cause was a flaw in the heat affected zone of the vent pipe weld. The cause of the crack propagation was determined to be vibration induced cavitation of the flaw due to the throttling of essential cooling water flow. The licensee's reportability review and root cause investigations concluded that train C had been inoperable since December 17, 2009, because pictures taken that day revealed that the crack had exceeded 3 inches in length. The licensee concluded that they would have been required to shut down train C at that point and initiate repairs based on their interpretation of NRC Generic Letter 90-05. Therefore, the licensee initially determined that train C of essential cooling water had been inoperable for a total of 8 days (December 17 to December 25).

The inspectors reviewed the root cause investigation, licensee event report, corrective action documents (including reportability review), pictures, procedures, and interviewed personnel involved with the event. The inspectors questioned the licensee's conclusion that the train was only inoperable for 8 days based on the amount of time elapsed since the initial identification of a problem (October 27, 2009) and rate of increased leakage (approximately a factor of 3 every 3 weeks). Due to the inspectors' questions, the licensee found additional pictures that were taken on December 14, 2009, which showed essentially the same crack length as shown on December 17, 2009. There were no pictures prior to December 14 that showed firm evidence that the crack length had exceeded 3 inches. The inspectors' questions prompted the licensee to revise the licensee event report submittal to indicate that essential cooling water train C was inoperable for 11 days instead of 8 days. The inspectors determined that a performance deficiency existed because the licensee failed to take actions to characterize and repair the flaw as required by 10 CFR 50.55(a) and described in NRC Generic Letter 90-05. NRC Generic Letter 90-05 states that each through-wall leak of ASME Class 2 or 3 piping be evaluated; instead, licensee personnel relied upon a previous engineering evaluation which delayed evaluation of this particular through-wall leak. The inspectors determined, through interviews with licensee staff and by reviewing licensee's root cause evaluation, that the engineering personnel consulted by operations to perform through-wall leak evaluations for Class 3 piping were not adequately trained on the actions described in NRC Generic Letter 90-05. This lack of training resulted in inadequate operability guidance and was the most significant contributor to the finding.

Analysis. The failure to repair the essential cooling water train C return line pipe within the time allowed by technical specifications without applying the configuration risk management program was a performance deficiency. The finding was more than minor because the through-wall leak could have challenged the structural integrity of the piping and it was associated with the Mitigating Systems Cornerstone attribute of configuration control and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors performed the initial significance determination for the inoperable essential cooling water train using the NRC Inspection Manual 0609,

Attachment 0609.04, dated January 10, 2008, "Phase 1 - Initial Screening and Characterization of Findings," because it affected the Mitigating Systems Cornerstone while the plant was at power. The finding screened to a Phase 2 significance determination because it involved an actual loss of safety function of a single train of equipment for greater than its technical specification allowed outage time.

A Region IV senior reactor analyst performed a Phase 2 significance determination using the presolved worksheet from the "Risk Informed Inspection Notebook for South Texas Project Electric Generating Station," Revision 2.01a. The exact history and growth rate of the crack were unknown, so the analyst assumed a bounding exposure period of 1 year. The finding was potentially Yellow, which warranted further review.

The Region IV senior reactor analyst performed a bounding Phase 3 significance determination. From discussions with the inspectors, the analyst determined that the piping would have remained functional for its probabilistic mission time of 24 hours for all events with the possible exception of seismic induced events. Therefore, there was no quantifiable change in risk for internal events. For seismic event initiators, the analyst noted that the through-wall crack (approximately 3 inches long) presented only a small fraction of the total perimeter of the 30-inch diameter pipe. Catastrophic piping failure was not expected even for the most limiting seismic events. However, the crack could grow and leakage could increase to a point where operators would need to secure the train to avoid internal flooding. The analyst conservatively assumed that a seismic event sufficient to cause a loss of offsite power would cause significant crack growth. Less than this level of seismic disturbance would not cause significant crack growth. The "Risk Assessment of Operational Events, Volume 2 – External Events," Revision 1.01, specifies the initiating event frequency for a seismically induced loss of offsite power as  $1.4E-5$ . The analyst used the South Texas Project, Units 1 and 2, Simplified Plant Analysis Risk Model, Revision 3.50, dated September 25, 2009, to calculate the conditional core damage probabilities for: 1) a seismically induced loss of offsite power initiating event without a failed essential cooling water train, and 2) a seismically induced loss of offsite power initiating event with a failed essential cooling water train. For the run with the failed train, the analyst set "fail to run" to a probability of 1.0. The analyst used a cutset truncation of  $1.0E-13$ .

The conditional core damage probability for a seismically initiated loss of offsite power without a loss of an essential cooling water train was  $3.6E-4$ . The conditional core damage probability for a seismically induced loss of offsite power with a loss of an essential cooling water train was  $3.0E-3$ . Therefore, the delta-core damage frequency, assuming a full year of exposure, was:

$$\text{Delta-Core Damage Frequency} = 1.4E-5 * (3.0E-3 - 3.6E-4) = 3.7E-8$$

Since the calculated change in core damage frequency was less than  $1E-6$ , the finding was of very low safety significance (Green). In addition, since the delta-core damage frequency was less than  $1E-7$ , the finding did not represent a significant contributor to the large early release frequency.

The dominant core damage sequence included: seismic initiated loss of offsite power, failure of the essential cooling water train C, failure of the train A and B standby diesel generators, failure to recover offsite power and a standby diesel generator in 4 hours, and an event initiated reactor coolant pump seal loss-of-coolant accident.

Remaining mitigation equipment that helped to limit the significance of the finding included the remaining functional essential cooling water trains and the turbine-driven auxiliary feedwater pump.

In addition, this finding had human performance crosscutting aspects associated with resources in that the licensee did not ensure that training of personnel about the requirements for properly characterizing Class 3 piping leaks was adequate to assure nuclear safety [H.2(b)].

Enforcement. Technical Specification 3.7.4 requires, in part, that three independent essential cooling water system loops shall be operable during Modes 1, 2, 3, and 4. With only two essential cooling water loops operable, within 7 days restore at least three loops to operable status or apply the requirements of the Configuration Risk Management Program, or be in at least hot standby within the next 6 hours. Contrary to the above, from December 14 to December 25, 2009, the licensee operated with one essential cooling water loop inoperable for approximately 11 days, without taking the appropriate actions listed in the technical specification. Since this violation was of very low safety significance and was documented in the licensee's corrective action program as Condition Report 09-17531, it is being treated as a noncited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000499/2010004-01, "Failure to Repair Essential Cooling Water System Leak within the Technical Specification Allowed Outage Time."

.2 Failure to Perform Adequate Operability Review of High Temperatures in Isolation Valve Cubicle Room

Introduction. The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings," for the failure to follow Procedure OPGP03-ZO-9900, "Operability Determinations and Functionality Assessments," Revision 1.

Description. On August 4, 2010, during the course of the day, the Unit 2 isolation valve cubicle room temperature exceeded 104°F for greater than 8 hours and reached a peak recorded temperature of 109°F. Per Technical Requirements Manual Specification 3.7.13, when the temperature of the isolation valve cubicle exceeds 104°F for longer than 8 hours then an evaluation must be performed to determine continued operability of the affected equipment. The most limiting isolation valve cubicle room is the train D room as it contains the turbine-driven auxiliary feedwater pump. The equipment that would be affected by the higher temperatures that are required to operate are: auxiliary feedwater pump turbine isolation valve, feedwater isolation valve solenoid valves, feedwater isolation bypass valve solenoid valves, steam generator preheater bypass valve solenoid valves, auxiliary feedwater outside containment isolation valve, and the auxiliary feedwater cross-connect valve close limit switch. The

licensee recognized the high temperature and made the following control room log entry, "This evaluation has been performed and is contained in CREE 05-8880-1 and has been re-evaluated in CR# 10-14376-2. All equipment remains operable in D-Train IVC." This same log entry was used multiple times between June and August 2010 to document that the equipment was still operable. However, the peak of 109°F occurred on multiple days between August 4 and 24, 2010.

The inspectors interviewed station personnel and reviewed both of these condition reports and condition report 08-11351-1, which is also cross referenced for isolation valve cubicle high temperature. The inspectors determined that the previous prompt operability determinations concluded that the maximum recorded temperature had been 108°F and that the time allowed at this temperature was roughly 150 hours. The inspectors' review of the control room logs determined that both of these conditions were exceeded, 109°F and over 250 hours, therefore, a new prompt operability determination needed to be performed to ensure continued operability of the equipment, not only from an environmental qualification standpoint, but also from a high energy line break accident scenario. The inspectors determined that the licensee failed to follow their systematic process for operability determinations and failed to obtain interdisciplinary input to ensure that the evaluation still bounded the actual conditions. The licensee's corrective actions included performing a new prompt operability determination to ensure continued operability of the affected equipment.

Analysis. The failure to request a new prompt operability determination when conditions had changed, as required by the procedure, was a performance deficiency. The finding was more than minor because, if left uncorrected, it could have led to a more significant safety concern because system inoperability may not be recognized in a timely manner and it was associated with the Mitigating Systems Cornerstone attribute of configuration control and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors performed the significance determination using the NRC Inspection Manual 0609, Attachment 0609.04, dated January 10, 2008, "Phase 1 – Initial Screening and Characterization of Findings," because it affected the Mitigating Systems Cornerstone while the plant was at power. The finding was determined to be of very low safety significance (Green) because it was not a design or qualification deficiency, it did not result in the loss of a system safety function, it did not represent the loss of a single train for greater than technical specification allowed outage time, it did not represent a loss of one or more non-technical specification risk significant equipment for greater than 24 hours, and it did not screen as potentially risk significant due to seismic, flooding, or severe weather. In addition, this finding had human performance crosscutting aspects associated with decision-making in that the licensee did not make safety-significant decisions using a systematic process, specifically, not implementing roles and authorities as designed and obtaining interdisciplinary input and reviews [H.1(a)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these procedures. Procedure 0PGP03-ZO-9900,

“Operability Determinations and Functionality Assessments,” Revision 1, Section 4.4.2, “Prompt Operability Determination (POD),” required, in part, if the condition is bounded by a previous operability determination or new information will not change the outcome then a prompt operability is not necessary otherwise perform a prompt operability determination. Contrary to this, on multiple days from August 4 to August 24, 2010, the licensee recorded isolation valve cubicle room temperatures that were not bounded by the previous operability determinations and did not perform a new prompt operability determination. Since this violation was of very low safety significance and was documented in the licensee’s corrective action program as condition reports 10-18686 and 10-20024, it is being treated as a noncited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000498/2010004-02, and 05000499/2010004-02, “Failure to Perform Adequate Operability Review of High Temperatures in Isolation Valve Cubicle Room.”

## **1R18 Plant Modifications (71111.18)**

### Temporary Modifications

#### a. Inspection Scope

To verify that the safety functions of important safety systems were not degraded, the inspectors reviewed the temporary modification for restoring the misaligned shutdown bank rod M10 in Unit 2 on September 29, 2010.

The inspectors reviewed the temporary modification and the associated safety-evaluation screening against the system design bases documentation, including the UFSAR and the technical specifications, and verified that the modification did not adversely affect the system operability/availability. The inspectors also verified that the installation and restoration were consistent with the modification documents and that configuration control was adequate. Additionally, the inspectors verified that the temporary modification was identified on control room drawings, appropriate tags were placed on the affected equipment, and licensee personnel evaluated the combined effects on mitigating systems and the integrity of radiological barriers. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one sample for temporary plant modifications as defined in Inspection Procedure 71111.18-05.

#### b. Findings

No findings were identified.

## 1R19 Postmaintenance Testing (71111.19)

### a. Inspection Scope

The inspectors reviewed the following postmaintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- August 4, 2010, Unit 2, train B sequencer timing switch replacement for Mode 1 output actuation module
- August 6, 2010, Unit 1, automatic isolation of feedwater heater 11B resulting in reduced power to 88 percent and replacement of LSH7243A level tree assembly
- August 18, 2010, Unit 2, steam dump card failure which result in a loss of all function and subsequent card refurbishment on March 7, 2010, reviewed as a result of fatigue waiver
- September 3, 2010, Unit 2, solid state protection system train B main feedwater regulating valve FCV-0551 and FCV-0552 gray boot connector replacements and FCV-0553 and FCV-0554 splice replacements

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities for the following (as applicable):

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed
- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

The inspectors evaluated the activities against the technical specifications, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

### b. Findings

No findings were identified.



## 1R22 Surveillance Testing (71111.22)

### a. Inspection Scope

The inspectors reviewed the UFSAR, procedure requirements, and technical specifications to ensure that the surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning
- Evaluation of testing impact on the plant
- Acceptance criteria
- Test equipment
- Procedures
- Jumper/lifted lead controls
- Test data
- Testing frequency and method demonstrated technical specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME Code requirements
- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- Reference setting data
- Annunciators and alarms setpoints

The inspectors also verified that licensee personnel identified and implemented any needed corrective actions associated with the surveillance testing.

- July 22, 2010, Unit 2, essential cooling water 2A backwash buried piping internal and external inspection

- July 27, 2010, Unit 1, component cooling water outside containment isolation valve MOV-0291 to reactor coolant pump cooling
- July 29, 2010, Unit 1, component cooling water pump 1A reference value inservice test
- August 20, 2010, Unit 1, reactor coolant system inventory leakage detection and monitoring surveillance
- September 2, 2010, Unit 1, control room envelope tracer gas in-leakage test
- September 29, 2010, Unit 1, control rod operability testing, control rod exercising for reliable rod movement as a result of corrosion products from head replacement activities

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of six surveillance testing inspection samples as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

**1EP6 Drill Evaluation (71114.06)**

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on July 20, 2010, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the Unit 1 control room simulator, technical support center, and operations support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings were identified.

.2 Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for licensed operations personnel on September 1, 2010, which required emergency plan implementation by a licensee operations crew. This evolution was planned to be evaluated and included performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. Additionally, the inspectors observed the performance of the technical support center. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered them into the corrective action program. As part of the inspection, the inspectors reviewed the scenario package.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

**40A1 Performance Indicator Verification (71151)**

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the performance indicator data submitted by the licensee for the second quarter 2010 performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, "Performance Indicator Program."

This review was performed as part of the inspectors' normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings were identified.

.2 Safety System Functional Failures (MS05)

a. Inspection Scope

The inspectors sampled licensee submittals for the safety system functional failures performance indicator for Units 1 and 2 for the period from the third quarter 2009 through the second quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73." The inspectors reviewed the licensee's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports, and NRC integrated inspection reports for the period of July 2009 through June 2010 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one safety system functional failures sample per unit as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.3 Reactor Coolant System Specific Activity (BI01)

a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system specific activity performance indicator for Units 1 and 2 for the period from the third quarter 2009 through the second quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's reactor coolant system chemistry samples, technical specification requirements, issue reports, event reports, and NRC integrated inspection reports for the period of July 2009 through June 2010 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one reactor coolant system specific activity sample per unit as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.4 Reactor Coolant System Leakage (BI02)

a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system leakage performance indicator for Units 1 and 2 for the period from the third quarter 2009 through the second quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator logs, reactor coolant system leakage tracking data, issue reports, event reports, and NRC integrated inspection reports for the period of July 2009 through June 2010 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one reactor coolant system leakage sample per unit as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

**40A2 Identification and Resolution of Problems (71152)**

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

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and the classification, prioritization, focus, and timeliness of corrective actions. Minor issues entered into the licensee's corrective action program because of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized several corrective action items documenting issues associated with the surveillance test interval evaluation process. The inspectors reviewed the licensee's processes and procedures for implementing the licensee amendment which moved the surveillance test intervals from the technical specifications into a licensee controlled procedure. The inspectors compared the licensee's requirements to those documented in NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies, Industry Guidance Document," Revision 0. The inspectors verified that the licensee made changes to the surveillance frequency that met the requirements for risk changes, cumulative risk change, appropriate evaluation forms, decision-making panel meetings, risk management actions, and comprehensive risk management program implementation. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings were identified.

#### **40A3 Event Follow-up (71153)**

- .1 (Closed) LER 05000499/2010-001-00 and LER 05000499/2010-001-01, "Essential Cooling Water System Leak"

On October 27, 2009, a pinhole leak was discovered near the welded joint connecting a 1-inch vent valve line to a 30-inch essential cooling water return line from the Unit 2 train C component cooling water heat exchanger. Over the course of approximately 2 months, the pinhole leak developed into 10 pinhole leaks that the licensee eventually classified as a crack. The root cause of the crack propagation was vibration resulting from cavitation occurring as water flow is throttled in the essential cooling water system. This condition was documented in Condition Report 09-17531. The inspectors reviewed the licensee's event report and root cause investigation report, interviewed personnel, and inspected the Unit 2 train C essential cooling water system. The licensee submitted Revision 1 of this licensee event report because the amount of time the train was inoperable was increased from 8 days to 11 days based on additional questions by the inspectors. The inspectors also reviewed Revision 1 of this licensee event report. The inspectors determined that a violation of technical specifications had occurred because the licensee failed to correctly characterize the flaw, which resulted in the further degradation of the pipe, and eventually led to the inoperability of essential cooling water system train C. The enforcement aspects of this violation are discussed in Section 1R15. Revision 0 and 1 of this licensee event report are closed.

- .2 Unit 1 Automatic Reactor Trip

On August 20, 2010, at approximately 1525 central daylight time, the Unit 1 reactor experienced an automatic reactor trip while the plant was operating at 100 percent power. The NRC resident inspectors responded to the event. The inspectors verified that all control rods inserted as expected and that was not a complicated reactor trip. All safety and secondary systems functioned as expected. No safety injection was needed and no safety relief valves lifted. The inspectors verified that the plant was safe and stable in Mode 3 (hot standby) at normal operating temperature and pressure of 567°F and 2235 psig, respectively. The licensee was performing train R reactor trip breaker testing at the time of the event. The reactor trip was caused by an inadvertent turbine trip signal that was initiated during the testing. The licensee has submitted a licensee event report and began a root cause investigation of the event.

The Unit 2 reactor was not affected and continued to operate at 100 percent.

#### **40A5 Other Activities**

- .1 Temporary Instruction 2515/180, "Inspection of Procedures and Processes for Managing Fatigue"

- a. Inspection Scope

The objective of this temporary instruction was to determine if licensees' implementation procedures and processes required by 10 CFR 26, Subpart I, "Managing Fatigue," are in

place to reasonably ensure the requirements specified in Subpart I and being addressed. The temporary instruction applies to all operating nuclear power reactor licensees but is intended to be performed for one site per utility. The inspectors interfaced with the appropriate station staff to obtain and review station policies, procedures, and processes necessary to complete all portions of this temporary instruction.

b. Findings and Observations

No findings were identified.

.2 Temporary Instruction 2515/172, "Reactor Coolant System Dissimilar Metal Butt Welds" (Closed for Unit 1)

Temporary Instruction 2515/172 was previously performed at South Texas Project Electric Generating Station, Unit 1, during Refueling Outages 1RE14 and 1RE15. The results of those inspections are documented in NRC Inspection Reports 05000498/2008003 and 05000498/2009005.

a. Inspection Scope

Portions of Temporary Instruction 2515/172 for South Texas Project Electric Generating Station, Unit 1, were completed via in office review of licensee's procedures and programs between June 25, 2010, and July 9, 2010. Specific documents reviewed during this inspection are listed in the attachment. The following dissimilar metal butt welds were reviewed.

- One 16-inch pressurizer surge line nozzle which was mitigated during Refueling Outage 1RE13 using a weld overlay process, and was initially categorized as Category B following the weld overlay process. Following Revision 1 to Materials Reliability Program-139, the weld overlay classification was changed to Category F.
- Three 6-inch pressurizer safety nozzles were mitigated during Refueling Outage 1RE14 using a weld overlay process, and all were initially categorized as Category B after the weld overlay. Following Revision 1 to Materials Reliability Program-139, the weld overlay classifications were changed to Category F.
- One 6-inch pressurizer spray nozzle was mitigated during Refueling Outage 1RE14 using a weld overlay process, and was initially categorized as Category B following the weld overlay process. Following Revision 1 to Materials Reliability Program-139, the weld overlay classification was changed to Category F.



- One 6-inch pressurizer relief nozzle was mitigated during Refueling Outage 1RE14 using a weld overlay process, and was initially categorized as Category B following the weld overlay process. Following Revision 1 to Materials Reliability Program-139, the weld overlay classification was changed to Category F.
- Four 29-inch reactor pressure vessel outlet nozzles which are currently unmitigated. These welds have been classified as Categories D and J.
- Four 27.5-inch reactor pressure vessel inlet nozzles which are currently unmitigated. These welds have been classified as Categories E and K.

#### Licensee's Implementation of the Materials Reliability Program-139 Baseline Inspections (03.01)

This portion of Temporary Instruction 2515/172 was documented in NRC Inspection Report 05000498/2008003, Section 4OA5.2. Specific documents reviewed for this portion are listed in the attachment to the above inspection report. The baseline inspections of the pressurizer dissimilar metal butt welds were completed during the spring 2008 Refueling Outage 1RE14.

The licensee did not take any deviations from the baseline inspection requirements of Materials Reliability Program-139, and all other applicable dissimilar metal butt welds were scheduled in accordance with Materials Reliability Program-139 guidelines.

#### Volumetric Examinations (03.02)

The inspectors directly observed and reviewed records of nondestructive examination performed on the Unit 1 reactor pressure vessel inlet and outlet nozzles in NRC Inspection Report 05000498/2009005, Section 1R08. The inspectors performed the inspection per the requirements of Temporary Instruction 2515/172, but documented this review under the section for inservice inspection activities instead of under the temporary instruction. Documents reviewed for this inspection can be found in the attachment to the above inspection report. The inspectors concluded that the ultrasonic examination for these welds was done in accordance with ASME Code, Section XI, Supplement VIII, "Performance Demonstration Initiative," requirements regarding personnel, procedures, and equipment qualifications. Relevant indications were identified, compared with previous examinations, and dispositioned in accordance with the ASME Code and approved procedures.

The inspectors directly observed and reviewed records of nondestructive examination performed on the Unit 1 pressurizer weld overlays in NRC Inspection Report 05000498/2008003, Section 4OA5.2. Documents reviewed for this inspection can be found in the attachment to the above inspection report. The inspection coverage met the requirements of Materials Reliability Program-139 and relevant indications were identified, compared with previous examinations, and dispositioned in accordance with the ASME Code and approved procedures.

The inspectors reviewed the certification records of examination personnel for those personnel that performed the examinations of the nozzles. The inspectors also verified that the qualifications of all nondestructive examination technicians performing the inspections were current. This review was performed in NRC Inspection Reports 05000498/2008003 and 05000498/2009005.

Deficiencies were identified during the nondestructive evaluations and were correctly dispositioned. This review was performed in NRC Inspection Reports 05000498/2008003 and 05000498/2009005.

#### Weld Overlays (03.03)

Weld overlays on Unit 1, pressurizer spray, safeties, and relief nozzles were performed during Refueling Outage 1RE14 in the spring 2008. This portion of the temporary instruction was completed and documented in NRC Inspection Report 05000498/2008003, Section 4OA5.2. Documents reviewed for the inspection can be found in the attachment to the above inspection report.

#### Mechanical Stress Improvement (03.04)

The licensee did not employ a mechanical stress improvement process.

#### Inservice Inspection Program (03.05)

The licensee has prepared a Materials Reliability Program-139 Inservice Inspection Program. All the welds in the Materials Reliability Program-139 Inservice Inspection Program are appropriately categorized in accordance with Materials Reliability Program-139. The inservice inspection frequencies are consistent with the inservice inspection frequencies called for by Materials Reliability Program-139.

#### b. Findings

No findings were identified.

### **4OA6 Meetings**

#### Exit Meeting Summary

On October 7, 2010, the inspectors presented the inspection results to Mr. E. Halpin, President and Chief Executive Officer, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

#### **40A7 Licensee-Identified Violations**

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section 2.3.2.a of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as noncited violations.

South Texas Project, Unit 2, Facility Operating License Condition 2.C.1, requires "STPNOC is authorized to operate the facility at reactor core power levels not in excess of 3853 megawatts thermal (100% power) in accordance with the conditions specified herein." Contrary to the above, from August 28 – 30, 2010, the licensee operated above 100 percent power, as high as 100.16 percent power, as a result of incorrect constants in the new ultrasonic feedwater flow measurement calculator that was installed the morning of August 28, 2010. This resulted in a nonconservative correction to reactor power by 0.16 percent power. Upon recognition, the licensee reduced power below 100 percent and entered the correct constants into the ultrasonic feedwater flow measurement calculator. The licensee captured the issue in Condition Report 10-18932. The violation was processed through the significance determination process and screened as Green, because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment would not function.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

J. Ashcraft, Manager, Health Physics  
M. Berg, Manager, Design Engineering  
C. Bowman, General Manager Oversight  
J. Calvert, Manager, Training  
D. Cobb, STP Employee Concerns Program (EAP) Manager  
R. Dunn Jr., Manager, Fuels and Analysis  
T. Frawley, Manager, Operations  
R. Gangluff, Manager, Chemistry, Environmental and Health Physics  
C. Grantom, Manager, PRA  
E. Halpin, President and Chief Executive Officer  
W. Harrison, Manager, Licensing  
G. Hildebrant, Manager, Plant Protection  
G. Janak, Manager, Operations Division, Unit 1  
B. Jenewein, Manager, Systems Engineering  
J. Lovejoy, Assistant Maintenance Manager  
A. McGalliard, Manager, Performance Improvement  
R. McNiel, Manager, Maintenance Engineering  
J. Mertink, Manager, Maintenance  
J. Milliff, Manager, Operations Division, Unit 2  
C. Murry, Manager, Outage and Major Projects  
J. Paul, Engineer, Licensing Consultant  
L. Peter, Plant General Manager  
J. Pierce, Manager, Operations Training  
G. Powell, Vice President, Engineering  
M. Reddix, Manager, Security  
D. Rencurrel, Senior Vice President, Units 1 and 2  
M. Ruvalcaba, Manager, Testing and Programs  
R. Savage, Engineer, Licensing Staff Specialist  
M. Schaefer, Manager, I&C Maintenance  
K. Taplett, Senior Engineer, Licensing Staff  
P. Walker, Engineer, Licensing  
D. Zink, Supervising Engineer

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened and Closed

05000499/2010004-01	NCV	Failure to Repair Essential Cooling Water System Leak within the Technical Specification Allowed Outage Time (Section 1R15)
05000498/2010004-02 05000499/2010004-02	NCV	Failure to Perform Adequate Operability Review of High Temperatures in Isolation Valve Cubicle Room (Section 1R15)

Closed

05000499/2010-001-00 05000499/2010-001-01	LER	Essential Cooling Water System Leak (Section 4OA3)
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**LIST OF DOCUMENTS REVIEWED**

**Section 1R01: Adverse Weather Protection**

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
0PGP03-ZV-0001	Severe Weather Plan	15, 16
0PGP03-ZV-0002	Hurricane Plan	4, 5
0PGP04-ZO-0002	Natural or Destructive Phenomena Guidelines	41, 42

**Section 1R04: Equipment Alignment**

CONDITION REPORTS

09-3172	09-19144	10-10470
09-6993	10-8094	10-19832

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
5R209F05019#1	Piping and Instrumentation Diagram Component Cooling Water System	15
5R209F05020#1	Piping and Instrumentation Component Cooling Water System	16
5R209F05021#1	Piping and Instrumentation Diagram Component Cooling Water System	13
5N109F05037#1	Piping and Instrumentation Diagram Containment Spray System	19
5S142F00024#1	Piping and Instrumentation Diagram Auxiliary Feedwater System	11

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
0POP02-AF-0001	Auxiliary Feedwater	31
0POP02-CC-0001	Component Cooling Water	39
0POP02-CS-0001	Containment Spray Standby Lineup	9
5L019PS0004	Criteria for Piping Design and Installation	21
5R209MB1018	Component Cooling Water System	3

**Section 1R05: Fire Protection**

FIRE PREPLANS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
0-EAB76-FP-0017	Electrical Auxiliary Building QDPS Train A	3
0-EAB09-FP-0073	Electrical Auxiliary Building QDPS Train B	2
0-EAB08-FP-0072	Electrical Auxiliary Building QDPS Train C	2
0EAB06-FP-0062	Auxiliary Building HVAC Equipment Room Train A	3
0EAB06-FP-0061	Auxiliary Building HVAC Equipment Room Train B	2
0EAB06-FP-0063	Auxiliary Building HVAC Equipment Room Train C	2
0EAB06-FP-0085	Auxiliary Building HVAC Equipment Room	3

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
NFPA 72E-1978	National Fire Protection Association Standard on Automatic Fire Detectors	1978

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OPGP03-ZF-0001	Fire Protection Program	22
OPGP03-ZF-0018	Fire Protection System Functionality Requirements	15
OPGP03-ZF-0019	Control of Transient Fire Loads and Use of Combustible and Flammable Liquids and Gases	7

**Section 1R12: Maintenance Effectiveness**

CONDITION REPORTS

07-1696                      08-15146

MISCELLANEOUS

<u>TITLE</u>	<u>DATE</u>
MRBD, Maintenance Rule System Scoping Basis Report	July 27, 2005
Quarterly System Health Report 480 VAC MCCs (PF-PM), First Quarter 2009 through Second Quarter 2010	
Quarterly System Health Report Standby D/G (DG,JW,LU,DO,SD,DI,DX), Third Quarter 2008 through Second Quarter 2010	
Quarterly System Health Report QDPS (AM), First Quarter 2009 through Second Quarter 2010	

**Section 1R13: Maintenance Risk Assessment and Emergent Work Controls**

CONDITION REPORTS

10-9179                      10-15017                      10-15161  
10-14489                      10-15066                      10-15880  
10-15015

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
PM: SEM-1-99000649	Safety Injection System Refueling Water Storage Tank	2.0
PRA 10-016	RMTS PRA Functional Assessment for Train A Equipment	0

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
2112	Work Activity Risk Plan of Action Train B ESF Load Sequencer Cabinet	1

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
0PMP04-ZG-0004	Bench Testing of Relief and Safety Relief Valves	21
0POP01-ZO-0006	Risk Management Actions (RMAs)	17
0POP09-AN-03M3	Annunciator Lampbox 3M03 Response Instructions	28
0PSP15-SI-0001	Safety Injection System Functional Pressure Test	12

WORK AUTHORIZATION NUMBER

345172	359870	384819
345173	364205	406918
355039	368827	

**Section 1R15: Operability Evaluations**

CONDITION REPORTS

05-8601	10-2574	10-15832
05-11605	10-15348	10-15880
06-621	10-15668	10-16683
08-7045	10-15829	10-16735
09-17531	10-15830	10-18932
09-20019	10-15831	

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
NC-7032	Containment LOCA Pressure / Temperature Analysis	14
32712289	CSLT Credit Package 0PSP11-SI-16;17;18 and 0PSP11-CS-0006;7;8	
VTD-S637-0009	ESF Load Sequencer for South Texas Project Electric Generating Station	1
PRA-10-008	Risk Evaluation of ECW 2C Return Pipe Crack	0



PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OPGP03-ZE-0028	Contaminated System Leakage Test Program	8
OPOP09-AN-03M3	Annunciator Lampbox 3M03 Response Instructions	28

WORK AUTHORIZATION NUMBERS

304695	393509	408328
358005		

**Section 1R18: Plant Modifications**

CONDITION REPORTS

10-21066	10-21069
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PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OPOP04-RS-0001	Control Rod Malfunction	30
2TOP02-RS-0003	Rod Exercise (H2, F14, M10)	2

WORK AUTHORIZATION NUMBERS

406770

**Section 1R19: Postmaintenance Testing**

CALCULATIONS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
NC-7088	Allowable Feedwater Operating Temperatures at Various Power Levels	0

CONDITION REPORTS

09-19277	10-4446	10-17683
10-2331	10-15880	10-17948
10-2923	10-17338	10-18788
10-3076	10-17669	10-18823
10-3077		

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
8S179F00040#1	Piping and Instrumentation Diagram Heater Drips	38

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OPGP03-ZX-0002	Condition Reporting Process	38
OPOP03-ZG-0008	Power Operations	50 and 51
OPSP03-SP-0008B	SSPS Train B Quarterly Slave Relay Test	19
OTSP03-SP-0008B	SSPS Train B Slave Relay Alternate Continuity Test	2

WORK AUTHORIZATION NUMBERS

385060	408741	409501
398270	409472	509688
408328	409500	

**Section 1R22: Surveillance Testing**

CONDITION REPORTS

03-6687-13	09-19867	10-13144
03-7772	10-12161	10-17138
07-1936		

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OPCP09-ZR-0005	Determination of Primary to Secondary Leak Rate	12
OPEP10-ZA-0039	Visual Examination of Buried Piping Components	0
OPGP03-ZO-0041	Action for Monitoring Primary to Secondary Leakage	16
OPGP03-ZO-0046	RCS Leakage Monitoring	7
OPGP04-ZA-0606	Buried Piping Program	1
OPMP05-ZE-0312	Limatorque MOV Actuator Lubrication	24
OPSP03-CC-0004	Component Cooling Water Pump 1A(2A) Reference Values Measurement	10

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
0PSP03-CC-0010	Component Cooling Water System Miscellaneous Valve Operability Test	12
0PSP03-RC-0006	Reactor Coolant System Inventory	21
0PSP03-RS-0001	Monthly Control Rod Operability	30
0PSP03-RS-0004	Control Rod Operability Test (Six and Ten Steps)	4
0PSP11-HE-0003	Control Room Envelope Tracer Gas In-Leakage Test	0
1TOP02-RS-0003	Rod Exercise (F12, F2, N11, N5, K2, L13, E3, L3, K14)	3

WORK AUTHORIZATION NUMBERS

366688	393717	405393
369511	401274	405717

**Section 1EP6: Drill Evaluation**

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
10CFD-White	STPNOC Combined Functional Drill White Team Scenario Manual	July 20, 2010
10EDR-White	STPNOC Exercise Dress Rehearsal White Team Scenario Manual	September 1, 2010

**Section 40A1: Performance Indicator Verification**

CONDITION REPORTS

10-4432	10-11181	10-17138
10-5243		

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
LDG-01	Licensing Department Desktop Guideline NRC Performance Indicator: Safety System Function Failures	0

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
PI-0002	NRC Performance Indicator: Initiating Events Cornerstone (by Unit) and Barrier Integrity Cornerstone (by Unit) Desktop Guidelines	2
0PSP03-RC-0006	Reactor Coolant Inventory	21
AD-0007	Collection of NRC Performance Indicator Data - Reactor Coolant System Specific Activity	1

**Section 40A2: Identification and Resolution of Problems**

CONDITION REPORTS

08-13835	09-815	09-13012
08-13840	09-817	10-1621
08-17174	09-844	10-1626
09-114	09-3005	10-11558
09-811	09-3744	10-15325
09-813	09-5750	10-15781

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
NEI 04-10	Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies, Industry Guidance Document	0
NRC TI 2515/178	Risk Management Technical Specifications Initiative 5b Surveillance Frequency Control Program	
0PGP02-ZA-0003	Comprehensive Risk Management Program	13
0PGP02-ZA-0063	Surveillance Test Interval Evaluation Process	1

**Section 40A3: Event Follow-Up**

CONDITION REPORTS

05-8601	09-17531
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**Section 40A5: Other Activities**

Temporary Instruction 2515/180

CONDITION REPORTS

09-18111	10-4411	10-4460
10-3812	10-4458	10-17669

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION/DATE</u>
FFD001.03.HO.01	Access Authorization/Fitness for Duty Program Site Specific	
GET001.07.HO.01	Plant Access Site Specific	
GET001.08.HO.01	Generic Plant Access Training	
NOC-AE-10002524	Annual Fitness for Duty Program Performance Report for 2009	February 22, 2010
NOC-AE-10002573	Licensee Clarification Letter Regarding an Approved Exemption from Specific Requirements of Title 10 of the Code of Federal Regulations Part 26 (TAC Nos. ME2259/ME2260)	July 21, 2010
STP-401	Hours of Work	1
STP-502	Fitness for Duty	4

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OPGP03-ZA-0112	Fatigue Rule Waivers	0
OPGP03-ZA-0114	Fatigue Rule Program	0
OPGP09-ZA-0002	Fitness for Duty Program	19

Temporary Instruction 2515/172

MISCELLANEOUS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION/DATE</u>
1RE15ALLOY600 PLAN R0.xls	STP – Unit 1 – 1RE15 Alloy 600	October 5, 2009

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION/DATE</u>
MRP 139 inspection.xls	STP Unit 1 MRP-139 Butt Welds	June 30, 2010
	South Texas Project Long Range Outage Plan	6

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OPGP04-ZA-0013	Reactor Coolant System Materials Management Program	2
OPGP04-ZE-0006	Alloy 600 Materials Management Program	1