

South Texas 2

4Q/2011 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance:  Sep 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Corrective Actions from an Inadequate Extent of Condition Review

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criteria XVI, “Corrective Action,” for the failure to assure that conditions adverse to quality were promptly identified and corrected. Specifically, the licensee did not promptly identify and correct improperly installed temperature switches. On October 28, 2010, the Unit 2 essential cooling water vent fan 21A failed because the control power fuse blew due to an unused uninsulated wire. The root cause investigation determined that the unused wire had been installed when the switch was replaced in February 2005. The extent of condition review identified that a total of 60 switches had been replaced, but only one additional switch was verified and it also had an unused uninsulated wire. After inspector questioning, the licensee inspected the 12 actuation switches and determined that only the Unit 2 essential cooling water vent fans for trains A and C were affected. The licensee’s corrective actions included: performing an immediate and prompt operability, performing training with the maintenance personnel on the procedural requirements for unused wires, and scheduling the inspection of the 48 high/high temperature switches commensurate with risk significance.

This finding was more than minor because it was associated with the Mitigating Systems Cornerstone attributes of Design Control, Equipment Performance, and Human Performance and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The deficiency resulted in a potential inoperability of Unit 2 essential cooling water trains A and C since 2005. The senior resident inspector performed the initial significance determination for the essential cooling water issue using the NRC Inspection Manual Chapter 0609, Attachment 0609.04, “Phase 1 – Initial Screening and Characterization of Findings.” The finding screened to a Phase 2 significance determination because it involved an actual loss of safety function of two single trains of equipment for greater than the technical specification allowed outage time. A Region IV senior reactor analyst attempted to perform a Phase 2 significance determination using the pre-solved worksheets, but the Phase 2 process was not well suited for this issue. Therefore, the senior reactor analyst performed a bounding Phase 3 significance determination and found the finding to be of very low safety significance. The dominant core damage sequence included: seismic initiated loss of offsite power, failure of the essential cooling water trains A and C, failure of the train B emergency diesel generator, and failure to recover the diesel or offsite power in 4 hours. The low frequency of seismic induced loss of offsite power events at South Texas Project and the unaffected train B essential cooling water train helped to mitigate the finding’s significance. In addition, this finding had human performance cross-cutting aspects associated with decision-making, in that, the licensee failed to use conservative assumptions and verify the validity of the underlying assumptions [H.1(b)].

Inspection Report# : [2011004](#) (*pdf*)

Significance:  Sep 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Untimely Corrective Action to Correct an Inadequate Procedure

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criteria XVI, “Corrective Action,” for the failure to assure that conditions adverse to quality were promptly identified and corrected. Specifically, the inspectors determined that operations had no instructions for manual control of the 4160 Vac load tap changing

transformers. Procedure OPOP02-AE-0002, “Transformer Normal Breaker and Switch Lineup,” was not revised providing these instructions. In December 2010, Unit 2 experienced a material issue with the load tap changer, which required operations to take manual control of the load tap changer without procedure guidance. Subsequently, the licensee issued an operation’s standing order to allow for manual operations, but did not revise the procedure. In May 2011, the licensee experienced another material condition issue with the Unit 2 load tap changer that required operations to take manual control of the load tap changer, but since the procedure was never revised, operations found themselves operating the plant outside of procedures again. Corrective actions included revising Procedure OPOP02-AE-0002, to include manual operation of the load tap changer, and training all the operations personnel on the new procedure.

This finding was more than minor because it was associated with the Mitigating Systems Cornerstone attributes of Design Control and Procedure Quality, and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The deficiency resulted in operations not having any guidance on how to control the Units 1 and 2 train B 4160 Vac transformer load tap changer to ensure that the bus remained within technical specification surveillance requirement voltage limits. The inspectors performed the significance determination using NRC Inspection Manual Chapter 0609, Attachment 0609.04, “Phase 1 – Initial Screening and Characterization of Findings,” dated January 10, 2008, 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 represent a loss of safety system 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 cross-cutting aspects associated with decision making, in that, the licensee failed to communicate decisions and the basis for decisions to personnel who have a need to know the information to perform work safely [H.1(c)].

Inspection Report# : [2011004](#) (pdf)

Significance: G Jul 01, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Timely Correct Conditions Adverse to Fire Protection

The team identified a noncited violation of License Condition 2.E for the failure to implement and maintain in effect all provisions of the approved fire protection program. Specifically, the team identified two examples of failure to implement timely corrective actions to correct conditions adverse to fire protection. The first example related to making Procedure OPOP04-ZO-0001, “Control Room Evacuation,” Revision 33, consistent with the post-fire safe shutdown analysis in order to ensure the actions met critical time requirements. The second example related to not correcting a condition that could disable all three fire pumps simultaneously as a result of fire damage.

Failure to implement timely corrective actions in two instances for conditions adverse to fire protection is a performance deficiency. Both examples of this finding are of greater than minor significance because they impacted the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events (fire) to prevent undesirable consequences. A senior reactor analyst performed Phase 3 significance determination for both examples. The analyst calculated the risk associated with the first example for the actions taken outside the control room as $2.702E-7$. For the second example, the analyst assumed that a fire in Fire Area 67 would damage the electrical control cables for all three fire pumps and require manually starting a fire pump at the fire pump house. However, it was determined that a delay in fire suppression because of the need to use a fire hose would not result in a plant transient, require evacuation of the control room, or result in damage to any systems and components required for post-fire safe shutdown. Therefore, the senior reactor analyst determined that both examples of this finding are of very low safety significance (Green). The licensee entered this deficiency into the corrective action program as Condition Record 11-10905.

These examples of the performance deficiency had a crosscutting aspect in the area of human performance associated with resources because the licensee did not ensure that resources assigned to correct these deficiencies were adequate to assure nuclear safety. Specifically, the licensee failed to ensure adequate design margins by (1) failing to ensure that operators could perform all necessary manual actions prior to exceeding the regulatory requirements and (2) failing to modify the control circuits for the fire pumps to protect them against fire damage [H.2(a)].

Inspection Report# : [2011006](#) (pdf)

Significance:  Jun 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Fire Protection System Functionality Procedure Results in Failure to Establish Fire Watches

The inspectors identified a noncited violation of license condition 2.E, "Fire Protection Program," because of an inadequate procedure that resulted in the licensee failing to establish compensatory fire watches in eight fire zones with degraded fire detection equipment. On March 2, 2011, the inspectors reviewed fire impairments to ensure adequate compensatory actions were being implemented. The inspectors identified that fire watches were not implemented in several areas where the fire detection system was degraded because Procedure OPGP03-ZF-0018, "Fire Protection System Functionality Requirements," Revision 14, did not require a fire watch until greater than 50 percent of the fire detection functionality within the fire zone was degraded. The inspectors determined that the licensee failed to correctly copy the licensing basis NUREG-0452 technical specification requirements into the procedure. The licensee's corrective actions included: (1) posting an hourly fire watch; (2) changing the procedure to correctly reflect licensing basis requirements; and (3) providing training to fire safety and operations personnel.

The finding was more than minor because it was associated with the Mitigating Systems Cornerstone attribute of procedure quality and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, because the lack of compensatory measures could result in a delayed response to a fire. The inspectors performed the significance determination using NRC Inspection Manual Chapter 0609, Appendix F, dated February 28, 2005, because the finding affected fire protection defense-in-depth strategies, as described in NRC Inspection Manual Chapter 0609.04, Table 3b, "Phase 1 - Initial Screening and Characterization of Findings," dated January 10, 2008. The finding was assigned to the fixed fire protection systems category with a degradation rating of moderate because compensatory measures were not in place for unoccupied fire areas that had greater than 10 percent degradation of fire detection equipment. Because the finding was a programmatic weakness where multiple fire areas lacked compensatory measures and it had a moderate degradation rating, the finding required a Phase 3 analysis be performed by a senior reactor analyst.

The senior reactor analyst determined that the finding was of very low safety significance because there were no identified dominant core damage sequences, and, therefore, there was no quantifiable change to the core damage frequency. The functional fire detectors helped to mitigate the risk. This finding did not have cross-cutting aspects because the licensee had not made changes to this procedural requirement within the last 3 years, and therefore, was not indicative of current licensee performance.

Inspection Report# : [2011003](#) (pdf)

Significance:  Mar 31, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Inadequate Restoration Results in Void in High Head Safety Injection Pump 2C

The inspectors reviewed a self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings," for the failure to follow Procedure OPOP11-SI-0001, "Safety Injection/Containment Spray Pump Online Isolation and Restoration," Revision 0. During the performance of a surveillance test on Unit 2 high head safety injection pump 2C, air was vented from the flushing line vent valve. The acceptance criterion was that no air be vented. The source of the air was from a maintenance activity performed August 16-19, 2010. During the maintenance, the equipment clearance order boundary was moved from the discharge valve to the subsequent downstream valve. As a result, during restoration it was not recognized that this new boundary introduced approximately 7 feet of vertical piping that could not be vented. Corrective actions included venting using a high point downstream of the boundary valve; ensuring that the station is aware of the procedure and the reason behind the creation of the procedure to address the Generic Letter 2008-01 concerns, so that impact of changes to the work scope can be appropriately controlled and evaluated; and changing the wording of the procedure to not allow moving the boundary outside of the discharge valve while at power.

This finding was more than minor because it affected the Mitigating Systems Cornerstone attributes of Human

Performance and Procedure Quality and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This deficiency directly resulted in the high head pump containing a void in the system following maintenance after it was returned to an operable status. The inspectors performed the significance determination using NRC Inspection Manual Chapter 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," dated January 10, 2008, 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 a loss of a single train for greater than technical specification allowed outage time; it did not represent a loss of one or more nontechnical 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 cross-cutting aspects associated with work control in that the licensee did not incorporate actions to address the impact of changes to the work scope [H.3(b)].

Inspection Report# : [2011002](#) (pdf)

Significance:  Mar 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Perform an Immediate Operability Determination

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-ZX-0002, "Condition Reporting Process," Revision 38. On January 13, 2011, the licensee wrote Condition Report 11-1261 which states, in part, "Twenty-six transfer switches required by Technical Specification 3.3.3.5, Remote Shutdown System, appear to not be listed." Procedure OPGP03-ZX-0002, step 4.3.2 states, in part, that conditions that may have an impact on the operability of a technical specification related system shall be screened as yes or indeterminate. The corrective action program supervisor that screened this condition report marked the operability as "No." The inspectors questioned the licensee on January 14 and 18, 2011, as to why no immediate operability determination had been performed. The licensee's corrective actions determined that an immediate and subsequent prompt operability determination was warranted. The inspectors interviewed the supervisor and determined that the supervisor did not use conservative assumptions and adopt a requirement to demonstrate that the proposed action is safe in order to proceed when screening the issue for operability.

This finding was more than minor because it affected the Mitigating Systems Cornerstone attributes of Human Performance and Procedure Quality and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to recognize that risk-significant equipment is in a potentially inoperable condition and, as such, may not be able to perform its specified safety function would not be recognized and accounted for by operators. The inspectors performed the significance determination using NRC Inspection Manual Chapter 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," dated January 10, 2008, 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 a loss of a single train for greater than technical specification allowed outage time; it did not represent a loss of one or more nontechnical 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 cross-cutting aspects associated with decision making in that the licensee did not use conservative assumptions and adopt a requirement to demonstrate that the proposed action is safe in order to proceed [H.1(b)].

Inspection Report# : [2011002](#) (pdf)

Significance:  Mar 31, 2011

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Untimely Corrective Action to Correct Nonconforming Steam Generator Power Operated Relief Valve Condition

The inspectors reviewed a self-revealing noncited violation of 10 CFR Part 50, Appendix B, Criteria XVI, "Corrective Action," for the failure to assure that conditions adverse to quality were corrected in a timely manner, or that an evaluation to justify a longer completion time beyond the first available opportunity was performed. On June 2, 2008,

steam generator power operated relief valve 1A failed to stroke full closed as part of surveillance testing. The operability determination concluded that the steam generator power operated relief valves were operable but nonconforming. On August 25, 2010, steam generator power operated relief valve 1D failed to stroke closed as part of surveillance testing. This new prompt operability determined that the previous operability was flawed. It did not consider all functions associated with the valves, in particular, the dose mitigation function. It was also determined that the licensee failed to adequately track an operable but nonconforming condition to ensure resolution in a timely manner. The licensee has since updated the design modification timeline to install the failed closed circuitry in both units during the respective 2011 refueling outages.

This finding was more than minor because it affected the Mitigating Systems Cornerstone attributes of Design Control and Equipment Performance and affected the cornerstone objective to ensure that availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The deficiency resulted in the Updated Final Safety Analysis Report Chapter 15 Accident Analysis dose calculations being nonconservative if the relief valves would fail to go closed on loss of power. The inspectors performed the significance determination using NRC Inspection Manual Chapter 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," dated January 10, 2008, 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 a design or qualification deficiency confirmed not to result in loss of operability or functionality. In addition, this finding had problem identification and resolution cross-cutting aspects associated with the corrective action program in that the licensee did not thoroughly evaluate the problem such that the resolutions address causes, and did not properly evaluate for operability conditions adverse to quality [P.1(c)].

Inspection Report# : [2011002](#) (*pdf*)

Significance:  Jan 11, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Nonconservative Modeling of Engineered Safety Feature Transformer Load Tap Changer Controller Dead Band

The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, which states, in part, "measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions." Specifically, as of August 8, 2010, Calculation EC 5000 did not properly analyze the performance of the load tap changer controller for the new engineered safety feature transformer E1B for avoiding spurious separation of the offsite power supply. This finding was entered into the licensee's corrective action program as Condition Report 10-17147.

The team determined that the failure to properly analyze the performance of the load tap changer controller for the new engineered safety feature transformer E1B was a performance deficiency. The finding is more than minor because it is associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the team determined that the finding was of very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in loss of operability or functionality. Specifically, the licensee performed subsequent analyses, which demonstrated that the load tap changer controller would function as required to mitigate an accident. This finding had a crosscutting aspect in the area of human performance, resources, because the licensee failed to impart knowledge/training to personnel. Specifically, the licensee had not provided technical oversight of design changes prepared by the on-site contractor [H.2(b)].

Inspection Report# : [2010007](#) (*pdf*)

Significance:  Jan 11, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Calculations for Degraded Voltage Relay Voltage Setpoint

The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, which states, in part, "measures shall be established to assure that applicable regulatory requirements and the design basis are

correctly translated into specifications, drawings, procedures, and instructions.” Specifically, as of August 8, 2010, the team identified three examples of the violation where 1) the licensee’s calculations for starting motors during accident load sequencing were based on the minimum expected voltage assured by administrative controls, rather than the lowest voltage afforded by the degraded voltage relays; 2) the licensee did not have calculations to demonstrate that individual motors, other than motor-operated valve motors, could be started during steady state conditions, based on the worst case voltage afforded by the relays; and 3) the licensee used nonconservative acceptance criteria in calculations for motor control center contactor pick-up voltage. This finding was entered into the licensee’s corrective action program as Condition Reports 10-7244 and 10-19950.

The team determined that the failure to properly verify the adequacy of calculations for the voltage setpoint for the degraded voltage relays was a performance deficiency. The finding is more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the team determined that the finding was of very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in loss of operability or functionality. Specifically, the licensee performed subsequent analyses, which demonstrated that the degraded voltage relays would function as required to mitigate an accident. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance.

Inspection Report# : [2010007](#) (pdf)

Significance:  Jan 11, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Analysis of Emergency Core Cooling System Transfer to Containment Sump

The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, which states in part, “measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.” Specifically, prior to August 20, 2010, the licensee did not adequately analyze the transfer of the emergency core cooling systems and containment spray pump suction from the refueling water storage tank to the containment sump under postaccident conditions. The team determined that the current design calculations did not include the time required for the operators to close the refueling water storage tank isolation valves from the control room or account for the potential of water draining directly from the refueling water storage tank to the containment sump. This finding was entered into the licensee’s corrective action program as Condition Report 10-17868.

The team determined that the failure to adequately analyze the transfer of the emergency core cooling systems and containment spray pump suction from the refueling water storage tank to the containment sump under postaccident conditions was a performance deficiency. The finding is more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the team determined that the finding was of very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in loss of operability or functionality. Specifically, the licensee performed subsequent analyses, which demonstrated that the suction supplies would function as required to mitigate the accident. This finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance.

Inspection Report# : [2010007](#) (pdf)

Significance:  Jan 11, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Analysis and Procedures for Offsite Power Availability

The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, which states, in part, “measures shall be established to assure that applicable regulatory requirements and the design basis are

correctly translated into specifications, drawings, procedures, and instructions.” Specifically, as of August 20, 2010, the team identified two examples of the violation where 1) the licensee did not verify the adequacy of the design for avoiding spurious separation of the offsite power supply in that Calculation EC- 5000 did not analyze all alternate alignments of the electrical distribution system allowed by technical specifications; and 2) the licensee failed to properly translate the design into procedures, in that Procedure OPOP02-AE-0002 did not provide adequate controls for maintaining the availability of offsite power required by the design. This finding was entered into the licensee’s corrective action program as Condition Reports 10-17146, 10-17219, and 10-17618.

The team determined that the failure to analyze all alternate alignments of the electrical distribution system allowed by technical specifications and provide adequate controls for maintaining the availability of offsite power required by the design, was a performance deficiency. The finding is more than minor because it is associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Inspection Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the team determined that the finding was of very low safety significance (Green) because it was a design or qualification deficiency confirmed not to result in loss of operability or functionality. Specifically, the licensee performed subsequent analyses, which demonstrated that the offsite electrical distribution system would function as required to mitigate an accident. This finding had a crosscutting aspect in the area of human performance, resources, because the licensee failed to provide complete, accurate and up-to-date design documentation, including calculations and procedures, to assure nuclear safety [H.2(c)].

Inspection Report# : [2010007](#) (*pdf*)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

Last modified : March 02, 2012