ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

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Report No.:	50-498/99-11 50-499/99-11
Licensee:	STP Nuclear Operating Company
Facility:	South Texas Project Electric Generating Station, Units 1 and 2
Location:	FM 521 - 8 miles west of Wadsworth Wadsworth, Texas 77483
Dates:	April 4 through May 15, 1999
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ATTACHMENT:	Supplemental Information

EXECUTIVE SUMMARY

South Texas Project Electric Generating Station, Units 1 and 2
NRC Inspection Report No. 50-498/99-11; 50-499/99-11

Operations

- Reactor operators responded well to a feedwater flow transient and precluded a trip of the unit. Plant operators demonstrated good attention to detail during tagout activities. Reactor coolant system reduced inventory, midloop, and startup operations were performed in a deliberate and controlled manner by operators who were knowledgeable and trained in the evolution (Section O1.1).

- Walkdowns of plant equipment disclosed that operability, material condition, and housekeeping were acceptable in all cases. No substantive concerns were identified as a result of these inspections (Section O2.1).

- The licensee made a demonstrable improvement in reducing tagout errors during the Unit 1 outage. Management expectations were reinforced during training and evaluated faulted tagouts utilizing a mockup trainer. The licensee performed approximately 30,000 tagout-related activities without a significant error (Section O8.1).

- On March 29, 1999, the licensee discovered that inadequate verbal communication resulted in the performance of an incorrect procedure section. Operators placed the control room heating, ventilation, and air conditioning system in filtered recirculation mode and not in recirculation and filtered make-up mode in violation of Technical Specification 3.3.2.10.c Action 27. This violation is being treated as a noncited violation and is captured in the licensee's corrective action program as Condition Report 99-4632 (LER 498/99003) (Section O8.3).

Maintenance

- Maintenance and surveillance activities were well performed. Technicians were experienced and knowledgeable of their assigned tasks, equipment performance, and the significance of the systems being worked. An exceptionally detailed prejob brief was conducted which stressed plant safety and conservatism during on-line maintenance for the Unit 1 feedwater regulating valve controllers. Supervisors and system engineers were frequently monitoring job and equipment performance (Section M1.1).

- The licensee failed to identify a manufacturing defect in a new valve stem that was installed in a drain valve off the Unit 1 east moisture separator reheater. This resulted in a small unisolable steam leak that damaged the valve's motor operator (Section M1.1).

- Fuel handling was adequately performed. However, lack of attention to detail contributed to minor problems. These included: improperly inserting a fuel bundle in the core such that it caused another bundle to lean; inadvertently removing a poison panel from the spent fuel pool storage rack while removing a fuel bundle; and forgetting to remove a positioning handcrank before moving the refueling bridge electrically, throwing the handcrank free. Additionally, the licensee was unable to identify the source of a minor fuel leak during fuel inspection activities. Analysis of the isotopes present in

water samples demonstrated that the leak was very small and the licensee believed that it was located in a bundle that was to be discharged from the core. However, indications of a continued fuel leak were identified in the reconfigured core after the return to power (Section M4.1).

Engineering

- During the Unit 1 refueling outage, problems with three plant modifications were identified. The Standby Diesel Generator 11 digital governor control circuit modification included a design error such that a relay simultaneously received conflicting demands, causing rapid relay failure. A modification to the main feedwater regulating valve control circuit did not ensure sufficient tuning of system response, which caused feedwater flow oscillations. Operator response was hampered by excessively slow feedwater regulating valve operation in manual mode because the valve response characteristics had been modified. A modification to replace the reactor trip switches resulted in the switches not functioning as required, preventing the closing of the reactor trip breakers. The license failed to adequately verify the configuration of the new switches before installation, which was a minor violation due to the low safety significance. These examples demonstrated a weakness in the control of plant modifications (Section E1.1).

- Leak repairs to the Steam Generator 1D secondary side manway covers were effectively implemented using appropriate modification processes. The modifications were performed after proper engineering and safety analysis of the impact of the modification. The leak sealing program effectively incorporated industry guidelines and lessons learned and included adequate controls to minimize injection of sealant material into the process stream (Section E2.1).

- On March 27, 1999, the licensee discovered that the source range monitors were not properly surveillance tested in either unit. Specifically, long term degradation had not been properly checked as required by Technical Specification 4.3.1.1.6. This violation is being treated as a noncited violation and is captured in the licensee's corrective action program as Condition Report 99-4429 (LER 498;499/99002) (Section E8.1).

Plant Support

- The licensee successfully reversed the declining performance trend observed during the previous outage in the area of radiological work practices and low level contamination controls. Planning and staffing of health physics support of work were significantly improved. Contamination control improvements were effective in reducing the spread of low level contamination from the reactor containment building. Shielding and dose controls were effective in maintaining outage collective dose below budget (Section R1.1).

- The highly radioactive Unit 1 core barrel was successfully removed for inservice inspection using excellent planning and dose controls. Contingency planning for the evolution was extensive. The job was completed with minimal dose and without incident (Section R1.2).

Report Details

Summary of Plant Status

Unit 1 began the inspection period while offloading the core during its eight refueling outage. The unit tied to the grid on April 28, 1999. The unit performed an orderly ramp up to full power and remained there for the remainder of the inspection period.

Unit 2 began the inspection period at 10 percent power and remained at full power throughout the inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707, 71711)

The inspectors used Inspection Procedure 71707 to conduct frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety conscious. Specific comments and noteworthy events are discussed below.

On May 7, Unit 1 experienced feedwater flow oscillations on two occasions in Feedwater Line D while at full power. This resulted in steam generator water level perturbations. Operators entered Plant Operating Procedure 0POP04-FW-0001, Revision 11, "Loss of Steam Generator Level Control." By taking manual control, operators restored normal water level and feedwater flow. Maintenance and engineering provided prompt support for system monitoring and troubleshooting. Operators responded well to the transient and avoided tripping the unit.

The inspectors observed the following equipment clearance order tagout and releases: ECO A5066 for an integrated leak rate test of a mechanical penetration and ECO A3033 for the Train B residual heat removal system. The inspectors observed that operators were diligent in verifying labels and the proper condition of the required components. Operators initiated condition reports to report nonconforming material condition of components. See Section O8.1 for more discussion on tagout performance.

The inspectors verified that licensee performance during back-end midloop was consistent with the careful preparation and execution documented in NRC Inspection Report 50-498/99-06; 50-499/99-06 for front-end midloop. However, the inspectors observed that the Unit 1 vacuum fill following back-end midloop was slower than anticipated. After a thorough search for leak paths into the reactor coolant system, the licensee found that one of the vacuum units was not operating properly. This delayed the vacuum fill evolution. The vacuum unit was removed from service and the remaining vacuum unit drew the proper vacuum to continue with the vacuum fill procedure. Although operators maintained full control of all evolutions in the control room during vacuum fill procedures, other surveillance and work activities caused alarms to sound in the control room. At one point a control room operator involved with the vacuum fill evolution was handling radio and telephone handsets at the same time while having to establish charging to the reactor coolant system.

Unit 1 reactor coolant system heatup and reactor startup were executed in an orderly fashion. Criticality was achieved by diluting the reactor coolant system. Once criticality was achieved, the reactor was maintained in a stable condition for low power physics testing. On April 28, 1999, the licensee closed the main breaker, ending Refueling Outage 1REO8. During the reactor startup, the inspectors observed reactor operators performing reactivity manipulations in accordance with approved procedures. Mode changes were performed in a cautious, deliberate manner. Professional communication was evident throughout the startup.

O2 Operational Status of Facilities and Equipment

O2.1 Engineered Safety Feature (ESF) System Walkdowns (71707)

The inspectors used Inspection Procedure 71707 to walk down accessible portions of the following ESF systems:

- Residual heat removal system (Unit 1)
- Standby Diesel Generators 11 (Unit 1) and 23 (Unit 2)
- Containment Spray (Units 1 and 2)
- Containment Sumps (Unit 1)
- Hydrogen recombiners (Unit 1)

Equipment operability, material condition, and housekeeping were acceptable in all cases. The inspectors verified that the systems were properly aligned for the existing mode of operation. Control board walkdowns by the inspectors during the Unit 1 outage verified that ESF systems were aligned as required by Technical Specifications for the existing operating mode. The inspectors identified no substantive concerns as a result of these inspections.

O8 Miscellaneous Operations Issues (92700, 92901)

O8.1 (Closed) Violations 50-498/97005-03 and 50-499/97006-01: Multiple examples of improper tagout implementation. During the refueling outage, the licensee placed greater emphasis on proper equipment tagout performance in order to reverse the previously identified trend of outage tagout problems. In preparation for this outage, tagout procedure requirements and management expectations were reinforced with operators and work control personnel. Prepared tagouts received an extra review by a senior reactor operator. Operators were evaluated while executing faulted and unfaulted tagouts on a training mockup. Emphasis on tagout work was repeatedly observed by the inspectors during plant observations. As a result, the licensee executed approximately 30,000 tagout-related activities without a single significant error during the outage. This demonstrated that corrective actions were clearly effective. This item is closed.

O8.2 (Closed) Licensee Event Report 50-499/99003: Partial loss of offsite power due to switchyard failure. This event was discussed in detail in NRC Inspection Report 50-498/99006; 50-499/99006. During the event, operators did not fully understand the Technical Specification requirements for supplying offsite power to the

ESF buses. As a result, operators failed to comply with Technical Specification 3.0.3 and take the required 1 hour actions. The licensee conducted operator training to clarify the license basis and Technical Specification requirements for offsite power supplies. A Technical Specification change was being considered by the licensee to allow the flexibility that the system design and license basis permit. Additionally, the licensee was in the process of revising the loss of bus procedure and the ESF power availability surveillance to improve clarity and useability while incorporating Technical Specification references. Two violations were identified in NRC Inspection Report 50-498/99006; 50-499/99006 for which noncited violations were issued. No additional violations were identified during this review. Corrective actions for this event were appropriate. This item is closed.

O8.3 (Closed) Licensee Event Report 50-498/99003-00: Control room heating, ventilation, and air conditioning (HVAC) system placed in filtered recirculation mode of operation instead of being placed in recirculation and make-up filtration mode. Unit 1 entered Action 27 of Technical Specification 3.3.2.10.c when the Train C vital battery was rendered inoperable for planned maintenance. Action 27 required the control room HVAC system be placed in the recirculation and make-up filtration mode within 48 hours. When the 48-hour limit was about to expire, the control room unit supervisor directed a reactor operator to place the control room HVAC system in the recirculation and make-up filtration mode in accordance with Section 13 of the electrical auxiliary building HVAC system procedure. The unit supervisor made reference to the procedure section by title and not by section number. The reactor operator incorrectly performed Section 12 of the procedure which placed the system in filtered recirculation mode and not recirculation and filtered make-up mode. The licensee identified this condition during a control board walkdown during shift turnover the next day, and the system was placed in the correct configuration, exceeding the 48-hour action. The licensee identified inadequate verbal communication as the root cause of this event. Licensee corrective actions for this event included crew briefings on attention to detail during communications and inclusion of this event in upcoming operator requalification lessons learned training. This was identified as a violation of Technical Specification 3.3.2.10.c. This nonrepetitive, licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy and is captured in the licensee's corrective action program as Condition Report 99-4632 (NCV 50-498/9911-01).

II. Maintenance

M1 Conduct of Maintenance

M1.1 Maintenance and Surveillance Observations

a. Inspection Scope (62707, 61726)

The inspectors observed all or portions of the maintenance and surveillance activities listed below. For surveillances, the test procedures were reviewed and compared to the Technical Specification surveillance requirements and bases to ensure the procedures satisfied the requirements. Maintenance work was reviewed to ensure that adequate work instructions were provided, that the work performed was within the scope of the authorized work, and that the work performed was adequately documented. In all cases, the impact to equipment operability and applicability of Technical Specifications actions were independently verified.

Maintenance:

- Repairs to Main Feedwater Regulating Valve Controllers: WAN 160775 and 160776, "Improvement of feedwater regulating valve manual response time"
- Motor-operated valve repair and leak sealing on HD-MOV-0376

Surveillance:

- 0PSP03-SI-0029, "SI Accumulator Tank Upstream Check Valve Operability Test," Revision 8
- 0PSP03-SP-0013C, "Train C ESF Actuation and Response Time Testing," Revision 4
- 0PSP03-HC-0004, "Reactor Containment Building Normal Purge System Valve Operability Test (Cold Shutdown)," Revision 2
- 0PSP15-DG-0005, "Standby Diesel Generator 23 Functional Pressure Test," Revision 2
- 0PSP13-FW-0519, "Steam Generator Narrow Range Level Set II, Response Time Test," Revision 2
- 0PSP03-DG-0001, "Standby Diesel Generator 11(21) Operability Test," Revision 11
- 0PSP10-II-0003, "Core Peaking Factor and Single Point Axial Flux Difference Comparison"

b. Observations and Findings

Generally, the inspectors observed that the work performed during these activities was professional and thorough. Technicians were experienced and knowledgeable of their assigned tasks, equipment performance, and the significance of the systems being worked. Some of the surveillance tests required coordination with various control room operators and plant operators to effectively perform the surveillance such as the ESF actuation tests. In the performance of these surveillance tests, the inspectors noted very good command and control. The inspectors observed that supervisors and system engineers were frequently present to monitor job and equipment performance.

The inspectors observed the replacement of controller driver cards in each of the Unit 1 main feedwater regulating valve controllers. The system had been modified during the refueling outage to install redundant drivers. When Steam Generator 1D experienced water level oscillations on May 7, operators identified that the new controller response was too slow for effective control while in manual. The licensee decided to improve the controller response with the unit operating at full power and performed a careful review of the evolution before any work was performed. The inspectors noted that an exceptionally detailed prejob brief was conducted which stressed safety and conservatism. Contingency actions were discussed in detail. Unrelated plant work was curtailed to minimize operator distractions during the card replacements. System engineering and maintenance personnel worked closely with operations during planning and execution of the work. The cards were replaced without incident.

The inspectors observed repair work to a motor-operated drain valve for the east moisture separator reheater. The valve stem, replaced during the outage, began to leak steam which subsequently damaged the motor operator. The licensee injected leak sealant into the valve packing in an attempt to stop the leak, but it was unsuccessful. Maintenance subsequently determined that the steam was coming up through a manufacturing defect in the stem material that was not identified during installation. This omission resulted in making the valve unusable for the entire operating cycle. During the rework activities, the inspectors observed good work practices with good precautions to ensure worker safety. Licensee management was closely involved in evaluating the proper response to the problem. The inspectors verified that the valve was not required to operate during any accident.

c. Conclusions

Work performed during maintenance and surveillance activities was professional and thorough. Technicians were experienced and knowledgeable of their assigned tasks, equipment performance, and the significance of the systems being worked. An exceptionally detailed prejob brief was conducted which stressed plant safety and conservatism during on-line maintenance for the Unit 1 feedwater regulating valve controllers. Supervisors and system engineers were frequently present to monitor job and equipment performance.

M4 Maintenance Staff Knowledge and Performance

M4.1 Fuel Handling Observations

a. Inspection Scope (62707, 71707)

The inspectors observed activities associated with core offload and refueling in Unit 1; which included fuel handling evolutions in the refueling area, the spent fuel pool, and the control room. The vendor's F-5 Fuel Handling Instructions, Revision 14, and Plant Operating Procedure 0POP08-FH-002, Revision 10, were reviewed.

b. Observations and Findings

The inspectors observed that fuel handling practices were acceptable. Low speeds and/or manual inching were used when fuel being moved was in close proximity to other objects. The loading sequence was arranged to maximize open water moves while maintaining neutronic coupling with the source range monitors. A senior reactor operator was present on the refueling bridge supervising core alterations and in communication with control room personnel as required.

Foreign material controls were implemented; however, the inspectors noted a 2-inch piece of tape floating in the reactor cavity pool. Inspectors observed a lapse in attention to detail when the removable handcrank used to move the refueling bridge precisely for final bundle alignment was not removed. When the bridge was subsequently moved electrically, the handcrank was thrown off its mount. This lapse presented a personnel safety hazard as well as a potential for introduction of foreign material into the area.

During fuel handling evolutions, the licensee experienced two minor problems. On April 8, the licensee attempted to remove a fuel bundle from a storage rack in the spent fuel pool, but also pulled out a borated poison panel with it. When the panel was lifted clear of the rack, the panel leaned over and rested on the side of the spent fuel pool. This condition was not noticed until the fuel assembly was at the test fixture for ultrasonic testing. No fuel or equipment was damaged, but the adjacent fuel bundle had to be moved because it was no longer shielded by borated panels on all four sides as designed. The rack design was such that the borated panels were restrained, but not completely resistant to being snagged by the fuel handling tool while lifting. Condition Report 99-5531 documented the event. The licensee responded conservatively to the event by inspecting for damage and verifying proper shutdown margins were maintained. Plant Operating Procedure 0POP08-FH-0002, "Fuel Handling Machine," governing spent fuel pool evolutions contains a precaution on the lead-in guides. The fuel-handling crew had been briefed on this precaution.

While reloading the core, fuel assembly in location L6 was observed to be leaning. The licensee then identified that the bundle in location L7 was bowed such that the top was partially blocking access to location L8. The licensee concluded that, while inserting a fuel assembly in location L8, the top guide pin of the fuel assembly in location L7 was struck, pushing it out of its location and snaging the fuel assembly in location L6. While the fuel assembly in location L7 returned to its upright position, the fuel assembly in

location L6 did not and remained leaning. The licensee placed a dummy fuel assembly next to the leaning assembly to stabilize it and suspended all fuel movement while recovery planning was being formalized. The licensee removed adjacent fuel assemblies and uprighted the leaning fuel assembly. No damage was identified during visual inspections. The licensee reacted conservatively to the event. Contingency planning contributed to the successful recovery. Fuel handling was resumed with the assistance of underwater cameras.

The inspectors observed ultrasonic testing and visual inspection of fuel bundles as they were moved to the spent fuel pool. The unit had experienced a small fuel leak during the operating cycle. The ultrasonic testing was intended to identify the bundle that was leaking, but this was unsuccessful. The ultrasonic inspection identifies a leaking fuel rod by identifying water inside the rod. However, since the fuel was offloaded and inspected so soon after shutdown, any water in the rod was in the form of steam and was not detectable. The licensee believed there was a high probability that the bundle that had been leaking was thrice-burned based on isotopic analysis of the coolant. Since thrice burned fuel would not be returned to the reactor, exact identification was not required. However, following the return to power, the licensee identified elevated coolant activity consistent with a continued minor fuel leak.

c. Conclusions

Fuel handling was performed adequately. However, lack of attention to detail contributed to minor problems. These included improperly inserting a fuel bundle in the core such that it caused another bundle to lean, inadvertently removing a poison panel from the spent fuel pool storage rack while removing a fuel bundle, and forgetting to remove a positioning handcrank before moving the refueling bridge electrically, throwing the handcrank free. Additionally, the licensee was unable to identify the source of a minor fuel leak during fuel inspection activities. Isotopic anaylsis demonstrated that the leak was very small and was probably located in a bundle that was to be discharged. However, indications of a continued fuel leak were identified in the reconfigured core after the return to power.

III. Engineering

E1 Conduct of Engineering

E1.1 Mixed Engineering Performance Demonstrated in Implementing Plant Modifications

a. Inspection Scope (37551)

During the Unit 1 outage, the inspectors observed the installation and testing of plant modifications. The inspectors reviewed the modification documentation, 10 CFR 50.59 evaluations, and postmodification test plans. Discussions were held with system engineers.

b. Observations and Findings

Standby Diesel Generator Governor Upgrade

The licensee modified the Unit 1 Standby Diesel Generator 11 control system to install a digital governor. This was the first installation of a modification intended for all six standby diesel generators onsite. In addition to performing the same functions as the original governor, the new control scheme permitted slow engine starts for testing. Due to the extensive nature of the testing to confirm that the system performed as designed, the licensee integrated the test plan into Temporary Engineering Procedure 0TEP07-DG-0001, "Standby Diesel Generator Governor Upgrade Acceptance Test." The inspectors determined that the test plan was thorough and complete. However, during testing on April 8, the licensee identified that the modification erroneously wired part of the control circuit in a manner that caused opposing signals to a relay demanding both excitation and de-excitation. The relay quickly failed under these conditions. The licensee changed the modification to correct the situation and replaced the failed relay. The inspectors determined that the problem was a design error resulting from this modification. No violation was identified because the problem was identified and corrected prior to returning the system to service.

Feedwater Regulating Valve Control Modification

The licensee modified the main feedwater regulating valve control circuit to install dual drivers. This provided redundancy, which was intended to improve operator response to some potential failures. However, the inspectors observed that optimum control system response was not obtained prior to returning the plant to operation. As described in Section O1.1, feedwater flow oscillations were observed which were determined by the licensee to have been caused by suboptimal feedwater controller gain settings.

When the modification was designed, the valve operating characteristics in automatic mode remained unchanged. But in manual mode, the valve responded much more slowly than it had previously. When operators took manual control of feedwater flow in response to the feedwater flow oscillations, the slow valve movement hindered their response. Operations personnel concluded that the slow valve operating characteristics were unacceptable, so engineering promptly revised the modification to restore the manual valve response to what it had been prior to the modification. The inspectors determined that operators were not consulted before changing the valve operating characteristics.

The inspectors determined that manual control of the feedwater system was not credited in safety analyses. However, loss of feedwater was a significant accident initiator. Loss of feedwater was averted by operator action in manual mode in this instance. The problems with this modification both initiated a transient and negatively impacted operator response. No violation of NRC requirements was identified.

ESF Actuation and Reactor Trip Switch Replacement Modification

The licensee modified the design and replaced the ESF actuation and reactor trip switches in Unit 1. The new design was to improve the switch reliability and parts availability. Prior to returning the system to service, the licensee unsuccessfully attempted to close the reactor trip breakers. They discovered that the new switches prevented the closing of the breakers. The new switches were tested and found to have a break-before-make contact configuration. The licensee had specified that the switches be make-before-break in procurement documents. The switches were returned to the manufacturer who replaced them with switches of the correct configuration.

The inspectors determined that the wrong switch configuration was of minor safety significance because the system could not have been placed into operation successfully as configured (i.e., reactor trip breakers could not be shut). However, the switches should have been verified by the licensee to be in conformance with the purchase specification prior to installation. Failure to ensure that the ESF Actuation and Reactor Trip Switches were of the correct configuration was a violation of 10 CFR Part 50, Appendix B, Criterion VII, "Control of Purchased Material, Equipment, and Services." This failure constitutes a violation of minor significance and is not subject to formal enforcement action.

c. Conclusions

During the Unit 1 refueling outage, problems with three plant modifications were identified. The Standby Diesel Generator 11 digital governor control circuit modification included a design error such that a relay simultaneously received conflicting demands, causing rapid relay failure. A modification to the main feedwater regulating valve control circuit did not ensure sufficient tuning of system response, which caused feedwater flow oscillations. Operator response was hampered by excessively slow feedwater regulating valve operation in manual mode because the valve response characteristics had been modified. A modification to replace the reactor trip switches resulted in the switches not functioning as required preventing the closing of the reactor trip breakers. The licensee failed to adequately verify the configuration of the new switches before installation, which was a minor violation due to the low safety significance. These examples demonstrated a weakness in the control of plant modifications.

E2 Engineering Support of Facilities and Equipment

E2.1 Review of Steam Generator Leak Repairs

a. Inspection Scope (37551)

The inspectors reviewed the licensee's temporary modification documents, for sealing leaks on both 16-inch manways on the secondary shell of Steam Generator 1D, and the engineering standard for temporary leak repairs. The Updated Final Safety Analysis Report and information notices were also reviewed. Applicable drawings were used to verify dimensional data used in the calculations.

Temporary Modification TL1-99-6883-3
Temporary Modification TL1-99-6883-6
5H01HMS1059, Revision 3, "Engineering Standard for On-line Leak Sealant Injection"

b. Observations and Findings

The inspectors noted that the leak repairs were properly controlled as temporary modifications to the plant. Configuration controls utilized were appropriate to safety related equipment. A 10 CFR 50.59 review was performed as required.

The inspectors noted that the licensee verified the vendor's calculation results and assumptions, as well as the appropriateness of the sealant material selected for the specific application. Injection pressures and volume limits were appropriately established to minimize the chances of introducing the sealant into the operating part of the system. Controls were established for potential re-injections without permitting a change to the maximum allowable injection volume.

The licensee's leak repair program incorporated industry lessons learned and followed industry guidelines. Engineering personnel responsible for implementing the program were very knowledgeable and experienced.

c. Conclusions

The inspectors concluded that leak repairs to the Steam Generator 1D secondary side manway covers were effectively implemented using the appropriate modification process. The modifications were performed after proper engineering and safety analysis of the impact of the modification. The leak sealing program effectively incorporated industry guidelines and lessons learned and included adequate controls to minimize injection of sealant material into the process stream.

E8 Miscellaneous Engineering Issues (92700, 92903)

E8.1 (Closed) Licensee Event Report 50-498;499/99002: Inadequate performance of a Technical Specification surveillance when evaluating source range nuclear instrument discriminator bias curve results. On March 27, 1999, following the Unit 1 shutdown, operators identified that the source range monitors failed the channel check. While investigating the channel disparity, the licensee identified that source range monitors were not being properly surveillance tested in either unit. Detector anode voltage curves were required to be compared to original curves for each detector. However, none of the detectors in either unit, all installed in 1995, had its original curve available for comparison during surveillance testing. Detector performance had been adequately checked, but monitoring for long-term degradation had not been properly checked. The procedures used to satisfy Technical Specification Surveillance 4.3.1.1.6 were incorrect. The licensee implemented appropriate corrective actions, including comparing discriminator bias curves with the correct bias curves for each source range nuclear instrumentation detector in both units, planning to revise procedures prior to the next scheduled surveillance to incorporate the detector specific discriminator bias curves, and revising the master equipment database regarding the discriminator bias curves. This was a violation of Technical Specification 4.3.1.1.6. This nonrepetitive, licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-498;499/9911-02).

IV. Plant Support

R1 Conduct of Radiation Protection and Chemistry Activities

R1.1 Outage Radiological Work Practices Improved

a. Inspection Scope (71750)

During the refueling outage, the inspectors made numerous observations of radiological work, with particular attention to the control of work inside the reactor containment building.

b. Observations and Findings

The inspectors observed significant improvements in radiological work performance and preparation during this outage. Licensee management involvement in planning for the outage was better. Significant improvements in coordination and planning, with a focus on radiological controls, were evident during the outage. Staffing levels for health physics technicians and decontamination personnel were essentially doubled from the previous outage. Health physics support for specific jobs was sufficiently detailed to ensure adequate support was provided at all times throughout the outage. In particular, surveys were completed inside higher dose areas in containment promptly after shutdown, and shielding and staging for work were completed before the scheduled start of the work activities.

Steam generator entries were conducted using improved filtered ventilation and contamination control tents. Building ventilation was controlled to minimize air flow rates during contamination-likely work and to minimize flow out of the bioshield area.

Cross-contamination of personnel was minimized by rearranging traffic such that personnel entered the bioshield contaminated area at a different location from where personnel exited and removed protective clothing. Shielding and dose controls were effective in maintaining outage collective dose below budget.

c. Conclusions

The licensee successfully reversed the declining performance trend observed during the previous outage in the area of radiological work practices and low level contamination controls. Planning and staffing of health physics support of work were significantly improved. Contamination control improvements were effective in reducing the spread of low level contamination from the reactor containment building. Shielding and dose controls were effective in maintaining outage collective dose below budget.

R1.2 Core Barrel Removal Observations

a. Inspection Scope (71750)

The inspectors reviewed Plant Maintenance Procedure 0PMP04-RX-0007, Revision 6, "Reactor Vessel Lower Internals Removal and Installation," as well as the associated work plan, dose projections, and ALARA review. The plans were discussed with health physics personnel and operators. The inspectors then observed the removal of the core barrel.

b. Observations and Findings

The licensee removed the core barrel from the reactor vessel in order to perform required inservice inspections. It was necessary to lift the highly radioactive core barrel partially out of the refueling cavity. The resulting loss of shielding effect from the water in the pool necessitated careful radiological and logistical planning.

A walkthrough of the lift was conducted, which was used to determine the optimum positioning of the crane to deposit the core barrel onto the storage stand. The licensee effectively implemented controls to minimize dose during the evolution. During the evolution, all other work inside containment was stopped and the containment evacuated. Personnel involved in the lift were thoroughly briefed on the job and contingencies. Extensive use of video cameras allowed workers to remain outside the secondary bioshield wall in low dose areas.

Prior to the lift, the licensee had to cut the D-12 bottom-mounted instrument thimble. The thimble had previously stuck in a partially inserted position such that it was above the bottom of the core barrel lower plate. Contingency plans were in place to respond if the thimble got stuck in the bottom plate.

Dose rate estimates based on underwater surveys were good. ALARA planning was excellent. Dose for the evolution was only 36 mrem, well below budget. Contingency planning for the job was extensive and thorough.

c. Conclusions

The highly radioactive Unit 1 core barrel was successfully removed for inservice inspection using excellent planning and dose controls. Contingency planning for the evolution was extensive. The job was completed with minimal dose and without incident.

R8 Miscellaneous Radiation Protection Issues (92904)

R8.1 (Closed) IFI 50-498;499/98009-05: Potential for the spread of contamination due to ventilation flow. During Refueling Outage 2RE06, the inspectors noted that ventilation flow in the reactor containment building was from the contaminated area inside the bioshield to clean areas outside the bioshield. During Refueling Outage 1RE08, the

licensee reduced the amount of ventilation flow outside the bioshield; however, significant airflow still moved from the contaminated areas to the clean areas. During Refueling Outage 1RE08, the licensee maintained control of contamination inside and outside the bioshield by covering or tenting off areas, performing more frequent cleaning of affected areas, and obtaining airborne and contamination area surveys. Also, the licensee reduced ventilation air flow during contamination causing events commensurate with industrial safety. Licensee surveys (large area smears and air sample results) of these affected areas revealed that contamination was not being released in any measurable quantities creating airborne contamination or contamination areas in the affected areas of ventilation discharge. This item is closed.

Vi. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management on May 18, 1999. Management personnel acknowledged the findings presented. The inspector asked whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

X2 Management Meeting Summary

On April 14, 1999, the Regional Administrator for NRC Region IV visited the South Texas Project station. Meetings were held with licensee management representatives. Plant performance and industry events were discussed.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

W. Bullard, Supervisor, Health Physics
J. Burack, Supervisor, Design Engineering Department
T. Cloninger, Vice President and Assistant to the President and CEO
W. Cottle, President and CEO
B. Dowdy, Acting Plant Manager, Unit 2
E. Harper, Supervisor/Temporary, Design Engineering Department
S. Head, Licensing Supervisor
J. Johnson, Manager, Engineering Quality
T. Jordon, Manager, Systems Engineering
M. Kanavos, Manager, Mechanical-Civil
D. Leazar, Manager, Nuclear Fuel and Analysis Department
B. Mackenzie, Manager, Operating Experience Group
M. McBurnett, Director, Quality and Licensing
R. Morales, Supervisor, Engineering Specialist
G. Parkey, Plant Manager, Unit 1
J. Phelps, Manager, Unit 1 Operations
D. Rencurrel, Manager, Electrical/Instrumentation and Controls
B. Russell, Supervisor, Operations Support
G. Sandlin, Engineer Supervising
A. Schildkraut, Supervisor, Electrical, Design Engineering Department
J. Sheppard, Vice President, Engineering and Technical Services
W. Sotos, Supervisor/Temporary, Design Engineering Department
D. Stark, Manager, Technical Support, Design Engineering Department
S. Thomas, Manager, Design Engineering Department

INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering
IP 61726: Surveillance Observations
IP 62707: Maintenance Observations
IP 71707: Plant Operations
IP 71711: Plant Startup
IP 71750: Plant Support Activities
IP 92700: Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92901: Followup - Operations
IP 92903: Followup - Engineering
IP 92904: Followup - Plant Support

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-498/9911-01	NCV	Control room HVAC system placed in filtered recirculation mode of operation instead of being placed in recirculation and make-up filtration mode. (O8.3)
50-498;499/9911-02	NCV	Inadequate performance of a Technical Specification surveillance when evaluating source range nuclear instrument discriminator bias curve results. (E8.1)

Closed

50-498/97005-03 and 50-499/97006-01	VIO	Multiple examples of improper tagout implementation. (O8.1)
50-499/99003	LER	Partial loss of offsite power due to switchyard failure. (O8.2)
50-498/99003	LER	Control room HVAC system placed in filtered recirculation mode of operation instead of being placed in recirculation and make-up filtration mode. (O8.3)
50-498;499/99002	LER	Inadequate performance of a Technical Specification surveillance when evaluating source range nuclear instrument discriminator bias curve results. (E8.1)
50-498;499/98009-05	IFI	Potential for the spread of contamination due to ventilation flow. (R8.1)
50-498/9911-01	NCV	Control room HVAC system placed in filtered recirculation mode of operation instead of being placed in recirculation and make-up filtration mode. (O8.3)
50-498;499/9911-02	NCV	Inadequate performance of a Technical Specification surveillance when evaluating source range nuclear instrument discriminator bias curve results. (E8.1)

Discussed

None