UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

April 27, 2001

William T. Cottle, President and
Chief Executive Officer
STP Nuclear Operating Company
P.O. Box 289
Wadsworth, Texas 77483

SUBJECT: SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION-NRC INTEGRATED INSPECTION REPORT 50-498/00-14; 50-499/00-14

Dear Mr. Cottle:

On March 31, 2001, the NRC completed an inspection at your South Texas Project Electric Generating Station, Units 1 and 2, facility. The enclosed report documents the inspection findings which were discussed on April 3, 2001, with Ms. F. Mangan and other members of your staff.

This inspection 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. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the inspectors identified three issues of very low significance (Green). Two of these issues were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these issues as noncited violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny these noncited violations, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the South Texas Project Electric Generating Station, Units 1 and 2, facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

***/RA/***

David N. Graves, Chief
Project Branch A
Division of Reactor Projects

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

Enclosure:
NRC Inspection Report
50-498/00-14; 50-499/00-14

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**ENCLOSURE 1**

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

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|---|---|
| Docket Nos: | 50-498<br>50-499 |
| License Nos: | NPF-76<br>NPF-80 |
| Report No: | 50-498/00-14<br>50-499/00-14 |
| Licensee: | STP Nuclear Operating Company |
| Facility: | South Texas Project Electric Generating Station, Units 1 and 2 |
| Location: | FM 521 - 8 miles west of Wadsworth<br>Wadsworth, Texas 77483 |
| Dates: | January 1 through March 31, 2001 |
| Inspectors: | N. F. O'Keefe, Senior Resident Inspector<br>G. L. Guerra, Resident Inspector<br>D. R. Carter, Health Physicist<br>S. C. Schwind, Resident Inspector, Comanche Peak<br>C. A. Clark, Reactor Inspector<br>M. P. Shannon, Senior Health Physicist |
| Approved By: | D. N. Graves, Chief, Project Branch A |
| Attachment: | Supplement Information |

SUMMARY OF FINDINGS

South Texas Project Electric Generating Station, Units 1 and 2
NRC Inspection Report 50-498/00-14; 50-499/00-14

IR 05000498-00-14; IR 05000499-00-14; on 12/31/00-03/31/2001; STP Nuclear Operating Company; South Texas Project Electric Generating Station; Units 1 & 2. Integrated Resident & Regional Report; Event followup, ALARA Planning and Controls.

The inspection was conducted by resident inspectors and region based engineering and maintenance, and health physics inspectors. The inspection identified three Green findings, two of which were noncited violations. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using IMC 0609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in its Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/index.html.

A. Inspector Identified Findings

**Cornerstone: Initiating Events**

- Green. On February 7, 2001, Unit 2 operators improperly executed an attempt to transfer a pair of 13.8KV buses from one offsite power transformer to another, de-energizing the buses. One train of engineered safety feature (ESF) equipment lost power and was reenergized from its standby diesel generator. Operators manually tripped the reactor in response to loss of power to Reactor Coolant Pump 2A. The event was caused by operator error, lack of procedure guidance, time pressure to satisfy breaker interlocks, improper communications, and lack of supervision. Failure to provide adequate procedural steps to transfer offsite power sources was a violation of Technical Specification 6.8.1 and Regulatory Guide 1.33. This violation is being treated as a noncited violation consistent with Section VI.A.1 of the NRC Enforcement Policy and is in the licensee's corrective action program as Condition Report 01-2270.

  This issue had a credible impact on safety and could be viewed as a precursor to a more significant event. The errors removed the preferred offsite power from Train A safety equipment, challenging the ESF diesel and reducing the reliability of accident mitigation equipment in that train. The safety significance of this human performance related event was determined to be very low because all mitigation equipment remained available (Section 4OA3.1).

- Green. During a plant trip event, Unit 1 experienced an unexpected drop in reactor coolant system pressure that required an automatic safety injection actuation to restore plant pressure. Troubleshooting identified that both pressurizer spray controllers experienced a calibration shift during the rapid pressure transient that resulted in both spray valves staying open while demanded to close. The inspectors identified that the licensee did not attempt to determine the cause of the simultaneous calibration shift of these high risk components. Instead, these components were recalibrated and placed back in service with a plan to replace them with a different model during the next outage. This was done without evaluating the conditions under which the components

might fail again to help quantify the risk of returning the plant to operation. Additionally, a monitoring plan created to verify proper system operation would not have detected the type of failure observed, since it was a sudden failure during a pressure transient.

This issue affected the initiating events cornerstone and had a credible impact on safety. It was determined to have very low safety significance because the pressure transient caused by two stuck open spray valves was bounded by the analysis for a stuck open pressurizer power operated relief valve, which was described in Chapter 15 of the Updated Final Safety Analysis Report. (Section 4OA3.2).

**Cornerstone: Occupational Radiation Safety**

- Green. On March 13-14, 2001, the inspector identified two occasions when radiation protection personnel failed to keep radiation workers informed of the storage of radioactive materials on the 19 foot elevation inside the biological shield-wall of the Unit 2 reactor containment building. 10 CFR Part 19, Section 19.12(a) states, in part, that all individuals who in the course of employment are likely to receive in a year an occupational dose in excess of 100 millirem shall be kept informed of the storage, transfer, or use of radiation and/or radioactive material. The failure to keep radiation workers informed of the storage of radioactive materials is a violation of 10 CFR 19.12(a). These two examples of a violation are being treated as a noncited violation and are in the licensee's corrective action program as Condition Reports 01-4268 and 01-4307.

  This noncited violation was characterized as a Green finding using the Occupational Radiation Safety Significance Determination Process. This issue was determined to be of very low safety significance because these incidents did not result in an overexposure, or have a substantial potential for an overexposure, and the ability to assess dose was not compromised (Section 2OS2).

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 appear reasonable. These violations are listed in Section 4OA7 of this report.

## Report Details

### Plant Status

Unit 1 operated at full power during this inspection period.

Unit 2 began the period at full power. On February 4, 2001, power was reduced to eight percent and the main generator was taken off line to repair a generator casing drain line that cracked due to vibration, causing an excessive hydrogen leak. While preparing to place the generator back in service on February 7, an error during realignment of 13.8 KV buses resulted in loss of power to a reactor coolant pump. Operators manually tripped the reactor per procedure. The plant was restarted on February 8 and returned to full power. Coastdown operations began on February 25. On March 1, operators manually tripped the reactor when a switchyard breaker failure occurred while attempting to remove the north switchyard bus from service for planned maintenance. The breaker failure caused all running circulating water pumps to trip, removing all cooling to the main condenser and necessitating the manual trip. The unit was restarted on March 2, and ran at power levels between 48 and 89 percent until the plant was shut down for a scheduled refueling outage on March 7. At the conclusion of this inspection, Unit 2 was making preparations to restart.

## 1. REACTOR SAFETY

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity [Reactor-R]**

### 1R02 Evaluations of Changes, Tests, or Experiments (71111.02)

a. Inspection Scope

The inspector reviewed a sample of 13 safety evaluations to verify that the licensee's staff had appropriately considered the conditions under which the licensee may make changes to the facility or procedures or conduct tests or experiments without prior NRC approval.

The inspector reviewed a sample of 15 safety evaluation screenings, in which the licensee determined that safety evaluations were not required, to ensure that the licensee's exclusion of a full evaluation was consistent with the requirements of 10 CFR 50.59.

The inspector reviewed 23 condition reports initiated to address problems or deficiencies associated with the 10 CFR 50.59 process, to ensure that appropriate corrective actions were being taken. The inspector also reviewed licensee monitoring reports, an audit and a self-assessment to ensure that problems or deficiencies identified in the 10 CFR 50.59 area were appropriately addressed.

Procedures and other documents reviewed are identified in the report attachment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial System Walkdown

a. Inspection Scope

The inspectors performed a partial system walkdown of the Unit 1 auxiliary feedwater system, Trains A, B, and C, while Train D was removed from service. The inspectors used Plant Operating Procedures 0POP02-AF-0001, Revision 14, "Auxiliary Feedwater," and system drawings to verify that the unaffected trains were in a proper standby equipment and control room line up. The inspectors verified that components were in good material condition.

The inspectors performed a partial system walkdown of the Unit 1 emergency core cooling system, Trains B and C, while Train A was removed from service. The inspectors walked down control board indications and used system drawings to verify that the unaffected trains were in a proper standby equipment and control room line up, and that components were in good material condition.

The inspectors verified proper system alignment and setpoints for the Unit 2 cold overpressure mitigation system during periods when that system was required to be in operation by Technical Specifications.

b. Findings

No findings of significance were identified.

.2 Semi-Annual System Walkdown

a. Inspection Scope

The inspectors performed a complete system walkdown of all three trains of the Unit 2 Essential Cooling Water System. The inspectors utilized Plant Operating Procedure 0POP02-EW-001, Revision 13, "Essential Cooling Water Operations," piping and instrumentation drawings, and the Updated Final Safety Analysis Report information to verify that the trains were in a proper standby equipment and control room line up, and that components were in good material condition. The system walkdown included control board and electrical line ups.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Fire Area Walkdowns

a. Inspection Scope

The inspectors observed the control of transient combustibles and ignition sources, the material condition and operational line up of reactor plant active and passive fire protection systems, and the material condition and operational status of fire barriers used to prevent fire damage or fire propagation. The following plant areas were inspected:

- Unit 1 reactor containment building (Fire Zone Z210 and Z229)
- Unit 2 mechanical auxiliary building radioactive pipe penetration area (Fire Zone Z135)
- Unit 2 essential cooling water system pump rooms (Fire Zones Z603, Z604, and Z605)
- Unit 2 Mechanical Auxiliary Building Room 324C (Fire Zone Z122)

b Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

The inspectors reviewed the inspections of the lube oil and jacket water heat exchangers on Emergency Diesel Generator 21. The inspectors compared the results of the heat exchanger tests with the acceptance criteria outlined in the licensee's periodic heat exchanger performance inspection program. The inspectors also reviewed the licensee's response to Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment."

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

The inspectors evaluated the performance of licensed operators during training at the licensee's simulator facility on January 31, 2001. The inspectors observed crew performance on clarity and formality of communications, correct use of procedures,

high risk operator actions, and the oversight and direction provided by the shift supervisor. The inspectors verified the licensee's use of emergency action levels for proper emergency classification. The inspectors also observed classroom training on use of the revised on line risk monitor program on February 15, 2001.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

.1 Periodic Evaluation Reviews

a. Inspection Scope

The inspectors reviewed the licensee's reports documenting the performance of the last two Maintenance Rule periodic effectiveness assessments. These periodic evaluations covered a 12-month period from July 31, 1999, through July 31, 2000, and a 12-month period from July 31, 1998, through July 31, 1999. These two periodic evaluations were prepared as required by 10 CFR 50.65(a)(3).

The inspectors reviewed the conclusions reached by the licensee with regard to the balance of reliability and unavailability for specific Maintenance Rule functions. This review was conducted by examining the licensee's evaluation of all risk-significant functions that had exceeded performance criteria during the evaluation periods. The inspectors also examined the licensee's evaluation of program activities associated with placement of Maintenance Rule Program risk-significant functions in Categories (a)(1) and/or (a)(2). This review was conducted by the examination of periodic evaluation conclusions reached by the licensee for functions of the essential cooling water, auxiliary feedwater, essential chilled water, safety injection (high and low head), residual heat removal and associated systems.

b. Findings

No findings of significance were identified.

.2 Effectiveness of Maintenance Rule Program

a. Inspection Scope

The inspectors reviewed the Maintenance Rule Expert Panel Meeting minutes for those meetings listed in Attachment 1, with an emphasis on issues associated with functions of the essential cooling water, auxiliary feedwater, essential chilled water, safety injection (high and low head), residual heat removal and associated systems. For the identified functions, the inspectors obtained the needed documentation and assessed the Maintenance Rule Program performance related to:

- Program adjustments made in response to unbalanced reliability and availability

- Cause determination of degraded performance or failure to meet performance criteria
- Adequacy of corrective action and goal setting
- Monitoring of established goals for functions placed in Category (a)(1)
- Program revisions to scoping and risk-significance
- Creation of new risk-significant functions to improve performance monitoring
- Assessment of plant level performance

In order to validate that the licensee was identifying programmatic issues from outside of the Maintenance Rule Program, the inspectors also reviewed the reports for the Nuclear Quality and Licensing Department surveillances and self-assessments of the Maintenance Rule Program that are referenced in the attachment.

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

The inspectors evaluated the use of the corrective action system within the Maintenance Rule Program. This review was accomplished by the examination of the condition reports, work authorization numbers, and a sample of the control room logs listed in the attachment. The purpose of this review was to establish that the corrective action program was entered at the appropriate threshold for the purposes of:

- Starting the evaluation and determination of corrective action process when performance criteria was exceeded
- Correction of performance-related issues or conditions identified during the periodic evaluation
- Correction of generic issues or conditions identified during programmatic surveillances, audits, or assessments

b. Findings

No findings of significance were identified.

.4 Maintenance Rule Functional Failure Review

a. Inspection Scope

The inspectors reviewed the licensee's Maintenance Rule implementation for equipment performance problems, including:

- Unit 1 pressurizer spray valves controllers experienced a calibration shift during plant transient (Work Authorization Number (WAN) 196137, Condition Report (CR) 00-18748)
- Unit 1 steam generator level channel failure during plant transient (WAN 196043, CR 00-18641)
- Unit 1 steam dumps failed to fully close following plant transient (WAN 196063, CR 00-18658)
- Unit 2 essential cooling water flow transmitter (FT-6875) to Standby Diesel Generator 23 (Tool Pouch Maintenance Activity 378584, CR 99-5953)
- Unit 1 Stator Cooling Water Pump 12 failure (WAN 195698, CR 00-18715)

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessment and Emergent Work Evaluation (71111.13)

a. Inspection Scope

The inspectors reviewed selected activities regarding risk evaluations and overall plant configuration control. The inspectors discussed emergent work issues with work control personnel and reviewed the potential risk impact of these activities to verify that the work was adequately planned, controlled, and executed. The activities reviewed were associated with:

- North switchyard bus outage (potential impact to both units)
- (Unit 2) Centrifugal Charging Pump 2B rebuild
- (Unit 2) Reactor Coolant Pump 2A motor lift
- (Unit 2) Secondary side pressure testing of steam generators for leak detection
- (Unit 1) Steam Generator 1D preheater bypass valve repair and testing
- (Unit 2) Spent fuel pool cooling water pump high bearing temperatures

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Evolutions (71111.14)

.1 Unit 2 Shutdown to Repair Main Generator Hydrogen Leak and Subsequent Restart

a. Inspection Scope

Unit 2 operators reduced power and took the main generator off line on February 4, 2001, in response to an increase in main generator hydrogen leak rate. The inspectors observed operator performance during this unplanned shutdown. Plant equipment performance was verified to perform as expected, with no challenges to safety-related equipment. In particular, the inspectors observed the operation and trending of radiation monitors being used to trend operational leakage from all four steam generators during the shutdown to verify that leakage remained minor.

b. Findings

No findings of significance were identified.

.2 Unit 2 Startup Following Trip

a. Inspection Scope

Following the Unit 2 trip discussed in Section 4OA3.1, inspectors observed reactor restart activities on February 8-9, 2001. Since the licensee utilized two operating crews during the startup (the normally scheduled shift crew, and the crew that had received just-in-time training for the startup), the inspectors verified proper command and control, procedure use, reactivity control, and communications for this unusual staffing.

b. Findings

No findings of significance were identified.

.3 Response to Control Rod K-10 Lockout Difficulties for Rapid Refueling

a. Inspection Scope

On March 22, 2001, the inspectors observed the licensee's efforts to set the reactor pressure vessel head following refueling. Control Rod K-10 had been locked in a position slightly below the normal rapid refueling position (which is past fully withdrawn) due to difficulties getting it in the proper lockout position prior to head removal. The inspectors reviewed the special procedure created to withdraw the rod enough to allow setting the head on the reactor vessel, Plant Operating Procedure 0POP03-ZG-0013, Revision 1, "Rapid Refueling Rod Holdout Alternate Operations," and the 50.59 evaluation that supported it, Unreviewed Safety Question Evaluation 01-3810-4,

Revision 0. The inspectors attended the prejob brief and several problem resolution meetings that addressed procedure and equipment issues that impacted the evolution. The rod recovery, head setting, and rod insertion were observed.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following operability evaluations and supporting documents associated with the following problems in accordance with Inspection Procedure 71111, Attachment 15:

- (Unit 1) Failure of Fuel Handling Building Exhaust Filter 11B charcoal adsorber test and filter housing drain line not isolated (Condition Report 01-2623)
- (Unit 1) Centrifugal Charging Pump 1B increased vibrations following maintenance (CR 98-19051)
- (Unit 2) Residual Heat Removal Pump 2C tripped repeatedly following maintenance (CRs 01-2655, 01-3961)

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16)

c. Inspection Scope

The inspectors reviewed licensee identified operator workarounds, and other existing equipment conditions with potential to be workarounds, for the overall impact on human performance during event response. The inspectors specifically focused on identifying equipment conditions that would have a potential effect on the functionality of mitigating systems. The inspectors reviewed the following licensee condition reports for their impact on plant operations due to having to work around equipment problems.

Unit 1: Component cooling water leakage into reactor containment building chilled water expansion tank (CR 00-8564)

Low head safety injection pump discharge header requires depressurization twice per shift (CR 00-18876)

Letdown temperature control valve operation not as expected (CR 00-17062)

Unit 2: Component cooling water leakage into reactor containment building chilled water expansion tank (CR 00-8564)

Low head safety injection pump discharge header needs depressurization once per shift (CR 99-359)

Leakage into reactor coolant drain tank rising more rapidly than normal (CR 01-1406)

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17)

a. Inspection Scope

The inspectors reviewed design change package (DCP) documentation and observed the licensee's implementation of modifications to the containment building refueling machine and the installation of sipping capabilities. The inspectors also observed the operation of the equipment. The inspectors reviewed the following documents:

- DCP 99-8572-6 "In-mast Sipping Modification" (WAN 162436)
- DCP 95-5319-5 "Refueling Machine Modification" (WAN 158937)

The inspectors also reviewed DCP 97-12634-6 "Steam Generator Support Plate Expansion 3-Volt Alternate Plug Criteria and Sleeve Installation," a modification to selected Unit 2 steam generator tubes to install sleeves and expand the tubes above and below the three lower tube support plates to lock the support plates in place. This modification was made in support of a change to Technical Specification steam generator tube inspection criteria.

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors observed and/or evaluated postmaintenance testing performed on the following equipment to determine whether the tests adequately confirmed equipment operability:

- (Unit 1) Pressurizer pressure transmitter replacement (WANs 160256, 179230)

- (Unit 2) Standby Diesel Generator 23 mechanical governor replacement due to Part 21 notification (WAN 201243)
- (Unit 2) Pressurizer power operated relief valve preventive maintenance MMI-2RC-94006063 (WANs 101429, 101428)
- (Unit 2) Auxiliary Airlock (WANs 62291, 62292, 62293, 62294)
- (Unit 2) PMI-IC-FH-OOO1, "Refueling Machine Inspection," Revision 4 (WAN 158937)
- (Unit 2) Failure of feeder breaker to 4160 volt Auxiliary Transformer E2B (WAN 202561)

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

.1 Review of the Unit 2 Outage Plan

a. Inspection Scope

The inspectors reviewed the Unit 2 Eighth Refueling Outage Shutdown Risk Assessment to verify that the licensee appropriately considered risk in planning and scheduling the outage activities. The results of the licensee's Outage Risk Assessment and Management Program, time to boil and time to core damage profiles were reviewed against the schedule of activities to identify areas of concern and additional inspection focus.

The inspectors focused on the following activities:

- Transition and midloop operation
- Fuel offload and reload
- Periods with reduced cooling to the spent fuel pool

b. Findings

No findings of significance were identified.

.2 Monitoring of Reactor Shutdown and Plant Cooldown Activities

a. Inspection Scope

The inspectors observed control room operator actions during the reactor shutdown and assessed the licensee's compliance with Technical Specification limits during plant

cooldown. Plant Operating Procedure 0POP03-ZG-0006, Revision 17, "Plant Shutdown from 100% to Hot Standby," was reviewed.

b. Findings

No findings of significance were identified.

.3 Control of Outage Activities

a. Inspection Scope

The inspectors reviewed plant conditions and observed selected refueling outage activities throughout the outage to verify that the licensee maintained the plant in a configuration consistent with the requirements of Technical Specifications and with the assumptions of the outage risk assessment. The inspectors verified that emergent issues were properly assessed for their impact on plant risk.

Electrical power availability was periodically verified to meet Technical Specification requirements and outage risk assessment recommendations. Control room operators were observed and interviewed on the status of plant conditions. The inspectors reviewed equipment clearance activities, controls for reactivity management, and reactor coolant system inventory.

The inspectors reviewed the following equipment clearances:

- B14992, "Implement DCP 99-359-3 to Install Manual Isolation Valves Into the 2A Safety Injection Test Header"
- B14883, "Fill and Drain In-containment Storage Area, Fill Reactor Cavity using Safety injection System"
- B12993, "2RE08 Activities for 480 Volt Load Center E2B"
- B12880, "0POP03-ZG-0007 Requirements for Mode 4 and Mode 5"

b. Findings

No findings of significance were identified.

.4 Reduced Inventory and Midloop

a. Inspection Scope

The inspectors performed continuous coverage of Unit 2 midloop activities on March 10 and March 25-26, 2001. The inspectors verified that multiple sources of electrical power, multiple reactor vessel level indications, and multiple reactor coolant system temperature indications were available. Premidloop shutdown risk assessment group meetings were observed on March 8 and 23, 2001, to assess the adequacy of the

licensee's control of work activities to avoid negative impact on the safe conduct of midloop activities. The inspectors observed licensee compliance with the following procedures:

- 0POP03-ZG-0009, "Mid-Loop Operation," Revision 26
- 0POP03 -RC-0100, "Reactor Coolant System Vacuum Fill," Revision 15

b. Findings

No findings of significance were identified.

.5 Refueling Activities

a. Inspection Scope

The inspectors observed portions of core offload and core reload activities to determine if these activities were conducted in accordance with the Technical Specifications and administrative procedures. 0POP03-ZG-0013, "Rapid Refueling Rod Holdout Alternate Operations," Revision 1, was reviewed.

b. Findings

No findings of significance were identified.

.6 Monitoring of Heatup and Startup Activities

a. Inspection Scope

The inspectors observed control room operations and reviewed control room logs to verify that the Unit 2 operational mode changes, heatup and startup were conducted in compliance with Technical Specifications and administrative procedures and requirements. The inspectors also performed containment walkdowns to assess containment cleanliness and material condition of components. The following procedures were reviewed:

- 0POP03-ZG-0001, "Plant Heatup," Revision 28
- 0POP03-ZG-0004, "Reactor Heatup," Revision 19
- 0POP03-ZG-0005, "Plant Startup to 100%," Revision 31

b. Findings

No findings of significance were identified.

.7 Identification and Resolution of Problems

a. Inspection Scope

The inspectors screened all condition reports that documented problems identified during the Unit 2 outage to verify that problems were identified at an appropriate threshold.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors evaluated the adequacy of periodic testing of the following important nuclear plant equipment, including aspects such as preconditioning, the impact of testing during plant operations, the adequacy of acceptance criteria including test frequency and test equipment accuracy, range and calibration, procedure adherence, record keeping, the restoration of standby equipment, and the effectiveness of the licensee's problem identification and correction program. The inspectors observed or reviewed the following tests:

- (Unit 1) 0PSP03-AF-0007, Revision 17, "Turbine Driven Auxiliary Feedwater Pump Quarterly Test"
- (Unit 2) 0PSP03-RC-0010, Revision 6, "Pressurizer Power Operated Relief Valve Operability Test"
- (Unit 1) 0PSP11-ZH-0009, Revision 15, "Electrical Auxiliary Building and Fuel Handling Building Ventilation In-Place Adsorber Leak Test," and 0PSP11-ZH-0010, Revision 11, "Electrical Auxiliary Building and Fuel Handling Building Ventilation Adsorbent Test"
- (Unit 2) 0PSP03-DJ-0005, Revision 8, "125 Volt Class 1E Battery Performance Test"
- (Unit 2) 0PSP03-DG-0014, Revision 8, "Standby Diesel Generator 22 Loss of Offsite Power - Engineered Safety Feature Actuation Test"

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed Temporary Modification T2-01-4281-3, Rev. 0, "Install Temporary Refueling Machine Auxiliary Hoist," in accordance with Inspection Procedure 71111, Attachment 23, with respect to design-bases documentation, approvals, and tracking. The inspectors reviewed the 10 CFR 50.59 screening and updated procedures and drawings. The inspectors also walked down the modification to assure that appropriate tags were in place.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness [EP]**

1EP1 Drill Evaluation (71114.06)

a. Inspection Scope

On January 18, 2001, the inspectors observed licensed operator simulator training for the timing of event classification and notification, as well as protective action recommendation development. The licensee's critique of the crew's performance was reviewed for adequacy.

b. Findings

No findings of significance were identified.

## 2. RADIATION SAFETY

**Cornerstone: Occupational Radiation Safety [OS]**

2OS1 Access Control to Radiologically Significant Areas (71121.01)

a. Inspection Scope

The inspector interviewed radiation workers and radiation protection personnel involved in high dose rate and high exposure jobs during routine operations. The inspector also conducted plant walkdowns within the radiologically controlled area and conducted independent radiation surveys of selected work areas. The following items were reviewed and compared with regulatory requirements:

- Area posting and other controls for airborne radioactivity areas, radiation areas, high radiation areas, and very high radiation areas

- Locked and very high radiation area key controls
- Radiation work permits and radiological surveys involving airborne radioactivity areas and high radiation areas
- Conduct of work with the potential for high radiation dose (the transfer of reactor coolant mixed bed demineralized spent resin)
- Dosimetry placement when work involved a significant dose gradient
- Controls involved when handling highly radioactive items
- Condition reports involving high radiation area incidents
- Health physics 1999 self-assessment and radiological quarterly reports involving high radiation area controls

b. Findings

No findings of significance were identified.

2OS2 As Low as Reasonably Achievable (ALARA) Planning and Controls (71121.02)

a. Inspection Scope

The inspector interviewed radiation workers and radiation protection personnel throughout the radiologically controlled area and conducted independent radiation surveys of selected work areas. The following items were reviewed and compared with regulatory requirements:

- ALARA program procedures
- Processes used to estimate and track exposures
- Plant collective exposure history for the past 3 years, current exposure trends, and 3-year rolling average collective dose information
- Three radiation work permit packages from the outage work activities which had the potential to result in the highest personnel collective exposures during the inspection period (RWP 2001-2-0020, RWP 2001-2-0060, and RWP 2001-2-0156)
- Use of engineering controls to achieve dose reductions including temporary shielding
- Individual exposures of selected work groups (chemistry and engineering)
- Hot spot tracking and reduction program
- Plant related source-term data, including source-term control strategy

- Radiological work planning
- A summary of ALARA related corrective action reports written since November 1, 2000, (nine of these corrective action reports were reviewed in detail: CR00-17567, CR01-432, CR01-1705, CR01-1822, CR01-2283, CR01-2427, CR01-2443, CR01-3302, and CR01-3517)
- Declared pregnant worker dose monitoring controls
- Job site inspections and ALARA controls.

b. Findings

The inspector identified that the licensee failed to inform radiation workers of the storage of radioactive materials on two occasions. Before a tour of the Unit 2 Reactor Containment Building on March 13, 2001, the inspector was informed that the general area radiological conditions on the 19 foot elevation inside the biological shieldwall ranged from approximately 20 to 50 millirem per hour, with one area near the Steam Generator B intermediate loop reading 100 millirem per hour. However, during the tour, the inspector identified a trash storage area near the Steam Generator C intermediate loop that had bags of trash with radiation levels as high as 1000 millirem per hour on contact and 150 millirem per hour general area. No supplemental informational postings or signs were used to inform workers of this condition.

10 CFR Part 19, Section 19.12(a) states, in part, that all individuals who in the course of employment are likely to receive in a year an occupational dose in excess of 100 millirem shall be kept informed of the storage, transfer, or use of radiation and/or radioactive material. The failure to keep radiation workers informed of the storage of radioactive material (bags of trash) was identified as an example of a 10 CFR 19.12 violation.

On March 14, 2001, before a second tour of the same area, the inspectors were informed that the radiological conditions were the same as the day before with the exception of the high radiation trash storage area near the Steam Generator C intermediate loop. However, during the tour, the inspectors identified a vacuum cleaner used to support steam generator work near the Steam Generator A/D work area that caused radiation levels as high as 1000 millirem per hour on contact and 450 millirem per hour general area. As with the previous example, no supplemental information postings or signs were used to inform workers of this condition.

The March 14, 2001, failure to keep radiation workers informed of the storage of radioactive materials (vacuum cleaner) was identified as a second example of a 10 CFR 19.12 violation. These two examples are being treated as a noncited violation consistent with Section VI.A.1 of the NRC Enforcement Policy and are in the licensee's corrective action program as Condition Reports 01-4268 and 01-4307 (respectively) (NCV 499/0014-01).

These issues were characterized as a Green finding using the Occupational Radiation Safety Significance Determination Process. They were determined to have very low

safety significance. The failure to keep a radiation worker informed of the storage of radioactive materials has a credible impact on safety. However, there was no overexposure, or substantial potential for an overexposure, and the ability to assess dose was not compromised.

**Cornerstone: Public Radiation Safety [PS]**

2PS2 Radioactive Material Processing and Transportation (71122.02)

a. Inspection Scope

The inspector interviewed radiation protection personnel involved in material processing and transportation activities, and walked down the liquid and solid radioactive waste processing systems to verify that the current system configuration and operation agreed with the descriptions contained in the Final Safety Analysis Report and the Process Control Program. No shipments of radioactive materials were conducted during the inspection. The following items were reviewed and compared with regulatory requirements:

- The adequacy of any changes made to the radioactive waste processing systems since the last inspection
- Waste stream sampling procedures and radio-chemical sample analyses results of the licensee's radioactive waste streams
- Scaling factors and calculations used to account for difficult-to-measure radionuclides
- 10 CFR Part 20, Appendix G, quality assurance program
- Documentation for seven nonexcepted package shipments that demonstrated shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and licensee verification of shipment readiness
- Applicable transport cask Certificates of Compliance
- Transferee licenses
- Procedures for cask loading and closure
- Training of personnel responsible for the conduct of radioactive waste processing and radioactive material shipment preparation activities
- Quality Assurance Audit 99-01, "Radiological Controls/Radwaste"
- Self-Assessment Audit CR 00-10032

- Corrective action reports related to the radioactive material and shipping programs written since the previous inspection

b. Findings

No findings of significance were identified.

## 4. OTHER ACTIVITIES [OA]

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

Occupational Exposure Control Effectiveness

The inspector reviewed corrective action program records for Technical Specification required locked high radiation areas, very high radiation areas, and unplanned exposure occurrences for the past 12 months to confirm that these occurrences were properly recorded as performance indicators. Radiologically controlled area entries with exposures greater than 100 millirems within the past 12 months were reviewed and selected examples were examined to determine whether they were within the dose projections of the governing radiation work permits. Whole-body counts or dose estimates were reviewed if the radiation worker received a committed effective dose equivalent of more than 100 millirems.

Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences

Additionally, radiological effluent release program corrective action records, licensee event reports, and annual effluent release reports documented during the past four quarters were reviewed to determine if any events exceeded the performance indicator thresholds.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed the licensee's posttrip review and corrective actions associated with Licensee Event Report 498/2000-007, "Manual Trip with Safety Injection."

b. Findings

The inspectors determined that the licensee did not effectively determine the cause for

two pressurizer spray valve controllers' calibration shifting during the event prior to plant startup. More discussion is provided in Section 4OA3.2 of this report.

## 4OA3 Event Follow-up (71153)

### .1 Unit 2 Manual Trip In Response to Inadvertent Loss of Power to Bus 2F

#### a. Inspection Scope

On February 7, 2001, Unit 2 operators manually tripped the reactor when power was inadvertently lost to Reactor Coolant Pump 2A. The inspectors responded to the site to verify that plant conditions were stabilized. The inspectors observed the event review team's investigation into the cause of the event and interviews with the operators involved.

#### b. Findings

On February 7, 2001, with the reactor at 10 percent power, Unit 2 operators were making preparations for starting up the main turbine generator. While attempting to transfer the power source to the 2F auxiliary and standby 13.8KV buses from the Unit 2 auxiliary transformer to the Unit 1 standby transformer, power was lost to 2F buses. This caused Reactor Coolant Pump 2A and the Train A safety buses to be deenergized. Standby Diesel Generator 21 automatically started and reenergized the Train A loads as expected. Operators manually tripped the reactor per procedure, and stabilized the plant. Plant equipment responded as expected during the event.

During the bus transfer, operators used Plant Operating Procedure 0POP02-AE-0002, Revision 10, "Transformer Normal Breaker and Switch Line up." The inspectors noted that this procedure provided no specific procedure steps, but rather required that the operators write the basic sequence on a form and have it approved by the Unit Supervisor. The approved form in this case included only instruction to shut the supply breaker from the Unit 2 standby transformer, then open the supply from the Unit 2 auxiliary transformer. The steps approved on the form were identical to those used by the same operators when practicing the evolution in the simulator the previous day. This left other steps that must be performed to successfully complete this evolution up to operator skill of the craft.

The bus transfer operation required briefly paralleling the two large transformers. A design feature of the system provided an alarm 4 seconds after paralleling, and a breaker trip after 8 seconds to enforce the philosophy that these two power sources should not be connected for a prolonged period. The breakers also had an interlock that prevented closing unless the synchronizer circuit for the breaker was energized, allowing operators to match voltage and parallel in phase.

Due to time pressure to satisfy the breaker interlocks, the Unit Supervisor and reactor operator divided responsibility for checking the expected indications during the manipulations. The reactor operator monitored the breaker indications, while the Unit Supervisor monitored for current changes consistent with breakers changing position.

The two did not discuss who would respond to annunciators. They agreed to abbreviated communications of indications that were observed, consistent with the practice of the previous day, rather than the normal three-way communications technique used by Operations Department personnel. However, when they started the manipulations, the reactor operator did not place the synchronizer switch to ON, and this error was not detected by the Unit Supervisor (on the previous day, the reactor operator had made the same error, but the Unit Supervisor detected and corrected the omission). When he tried to shut the first breaker, it did not close. The two miscommunicated the unexpected indications, and the reactor operator then opened the auxiliary transformer breaker and deenergized the bus without the Unit Supervisor realizing that he had done this. The 2F buses then deenergized, tripping the Reactor Coolant Pump 2A. Operators recognized this, and took immediate actions per procedure to trip the reactor.

**Root Causes**

Perceived and actual time pressure imposed by the breaker protective scheme led the Unit Supervisor to effectively forfeit his supervisory role and become a participant, and led both operators to use abbreviated communications that were ineffective when the indications were not as expected. The reactor operator disbelieved the breaker indication when it showed the first breaker had not closed, and failed to check an alarm, assuming it was the expected breaker parallel alarm. The alarm actually received indicated a breaker trip, which was caused by a demand for the breaker to close, but not actually closing. The Unit Supervisor observed no change in currents, which was consistent with the breaker not closing. He communicated this using words different than planned, which were not clarified due to time pressure, and subsequently misinterpreted.

The inspectors concluded that the procedure governing this evolution did not provide adequate guidance or require detailed steps to successfully perform this evolution. In particular, steps necessary to satisfy the synchronizer interlock and parallel in phase were not provided. The inspectors concluded that the licensee did not conduct enough actual or simulator switching operations to maintain the level of operator proficiency assumed when setting up the procedure. Technical Specification 6.8.1 and Regulatory Guide 1.33 require the licensee to have procedures for energizing and changing modes of operation for offsite and onsite electrical systems. Contrary to this, Plant Operating Procedure 0POP02-AE-0002, Revision 10, “Transformer Normal Breaker and Switch Line up,“ did not provide adequate instructions for transferring offsite power sources. This violation is being treated as a noncited violation consistent with Section VI.A.1 of the NRC Enforcement Policy and is in the licensee’s corrective action program as Condition Report 01-2270 (NCV 499/0014-02).

This issue had a credible impact on safety and could be viewed as a precursor to a more significant event. Additionally, the errors removed the preferred offsite power from Train A safety equipment, challenging the ESF diesel and reducing the reliability of accident mitigation equipment. This issue was determined to have very low safety significance because all mitigation equipment remained available.

.2 (Closed) Licensee Event Report 498/2000-007: Unit 1 manual reactor trip with safety injection.

a. Inspection Scope

The inspectors reviewed the Licensee Event Report and the associated special report for the emergency core cooling system actuation and injection required by Technical Specifications. Control room logs were compared to emergency operating procedures. The inspectors interviewed the Shift Supervisor, Unit Supervisor, and Shift Technical Advisor, Unit 1 Operations Manager, Plant Manager, selected engineering managers, and the Plant Operations Review Committee (PORC) Chairman. Posttrip Review 1-030 was reviewed, as were the PORC meeting minutes approving the results. The following condition reports were also reviewed:

00-18641
00-18642
00-18644
00-18646
00-18649
00-18657
00-18658
00-18748

b. Findings

During Unit 1 turbine valve testing, the turbine control system malfunctioned, causing loss of steam flow to the turbine, which in turn caused a rapid pressure increase in the primary plant. Operators recognized the load rejection and manually tripped the plant. The pressurizer power operated relief valves briefly opened and reclosed. While operators performed emergency operating procedure actions, primary pressure unexpectedly decreased to the point where automatic safety injection initiated and injected 2,200 gallons of borated water into the reactor coolant system to restore primary plant pressure.

Operator performance during this event was confirmed to be in accordance with emergency operating procedures and emergency operating procedures were adequate to stabilize the plant. However, this event was caused and complicated by numerous equipment failures which challenged operators, including:

- Main turbine controller card experienced an age-related failure (CR 00-18646)
- Both pressurizer spray controllers experienced calibration shift, causing both valves to stay open (CR 00-18748)
- Three steam dump valves failed to fully close, causing excess cooldown. Handwheel retaining ring failures caused valves to cock (CR 18658)
- Steam generator level instrument failure (CR 00-18641)

- Source Range Nuclear Instrument Channel 31 failure (CR 00-18642)

During troubleshooting, the licensee identified that the spray controllers had experienced a calibration shift during the rapid pressure transient. This caused both spray valves to stay partially open and decrease pressure when a close demand existed. When the safety injection actuation occurred, air was isolated to the spray valves, allowing them to close, and the water injected raised system pressure to normal.

The spray controllers were successfully recalibrated. The spray system was promptly returned to service on an interim basis because spray was needed to mix the contents of the pressurizer with the more borated reactor coolant system following shutdown. The licensee initially monitored the system carefully, and normal performance was noted for steady state operation in the shutdown plant. However, the inspectors noted that no follow-on plan was created to evaluate the system's ability to support the more rigorous conditions present during normal and transient operation. When questioned by the inspectors, engineering management agreed that the components could fail in the same way under similar conditions, since the same components remained installed. As a result of this oversight, the licensee did not compensate for the increased risk of failure by informing operators that recurrence was possible until the inspectors raised the issue.

The inspectors noted that the licensee's primary focus following the event was to determine the cause of the unexpected pressure decrease that led to the safety injection. Once the components that caused the problem were identified and recalibrated, the licensee shifted focus to restarting the plant. The Event Review Team and the Plant Operations Review Committee were specifically tasked with event review, not with restart readiness reviews. As a result, restart was performed after returning the controllers to their pre-event condition.

The licensee considered options for replacing the controllers. Engineering recommended replacing them with a different manufacturer's product during the next outage, and this action was approved. Replacement with new controllers of the same model was rejected as having more risk than benefit. The inspectors were concerned that this reasoning did not consider the risk associated with leaving parts in the plant that had already failed without warning, and which were believed to fail under severe transient conditions. Specifically, the licensee did not attempt to determine the conditions under which repeat failure might occur and assess plant response during those specific scenarios.

The inspectors concluded that the licensee did not attempt to determine the cause of the controllers calibration shifting. Operating experience for the nuclear industry was reviewed by the licensee, with no similar failures found. However, the vendor was not contacted to determine if any non-nuclear experience was available, or if the vendor could identify possible causes or make recommendations for additional troubleshooting, repair, or replacement. The controllers were also not internally inspected to look for damaged or defective parts. Since the system was not covered by Technical Specifications, an assessment of operability was not performed by the licensee. The inspectors noted that, while not required, such an assessment would have provided the proper framework for evaluating the system's ability to support plant restart and

subsequent safe plant operation.

The inspectors noted that the pressurizer spray controllers were risk ranked “high” by the licensee’s graded quality assurance program, and were also covered in the Maintenance Rule Program. The licensees corrective actions program and Maintenance Rule Program specified that the cause of failure of these components be determined. The inspectors concluded that this was not effectively performed, because the only cause analysis that was performed was looking for the cause of the safety injection following the plant trip. This analysis did not identify why the two high risk components responded as they did during the event.

This issue affected the initiating events cornerstone and had a credible impact on safety. It was determined to have very low safety significance because the pressure transient caused by two stuck open spray valves was bounded by a stuck open pressurizer power operated relief valve analysis, which was described in Chapter 15 of the Updated Final Safety Analysis Report. The presumed failure mode required a significant pressure increase in the primary plant, such as would be caused by a rapid load reject, inadvertent closure of main steam isolation valves, etc.. The licensee stated that, qualitatively, such significant pressure transients had a very low probability of occurrence. Response to a repeat failure would challenge mitigation equipment to avoid core damage. The licensee planned to perform a quantitative evaluation of risk for this condition in response to the questions raised by the inspectors.

.3 (Closed) Licensee Event Report 499/00-001: Engineered Safety Feature (ESF) actuation due to Anticipated Transient Without a Scram Mitigation System Actuation Circuitry (AMSAC). On February 9, 2000, with Unit 2 conducting a startup with reactor power at 32 percent, a valid AMSAC actuation occurred. This resulted in a turbine trip, auxiliary feedwater actuation, and steam generator blowdown and sampling isolation. The licensee determined that a modification to the AMSAC system design had lowered the setpoints which effectively reduced operating margin. When operators placed the system in service, they verified that the input parameters were above trip setpoints; however, operators used a temperature-compensated feedwater flow rate indication while the AMSAC system used an uncompensated input that was reading below the trip setpoint. The licensee revised procedures to place the AMSAC system in operation at a higher power level, effectively restoring the operating margin. No violations of NRC requirements were identified by the inspectors. Corrective actions were tracked under the licensee’s corrective action program by Condition Report 00-2194.

.4 (Closed) Licensee Event Report 499/00-003: Reactor containment building Penetration M-85 not properly isolated. The licensee reported that Unit 2 reactor containment building Penetration M-85, reactor coolant system hot leg sample line, had been improperly isolated from June 13-28, 2000, in violation of Technical Specification 3.6.3. The line was required to be isolated due to failure of Containment Isolation Valve PS-FV-4454. Isolation had been changed to permit taking a sample utilizing improper reviews of equipment clearance orders. Condition Report 00-11098 documented corrective actions taken under the licensee’s corrective action program.

Using the significance determination process, the NRC staff reviewed the risk

significance associated with the failure to maintain the Unit 2 Containment Penetration M-85 isolated following failure of Valve PS-FV-4454. The review included the risk associated with the change to the core damage frequency and large early release frequency.

An NRC risk analyst determined that there was effectively no change to the core damage frequency from the licensee's failure to maintain Containment Penetration M-85 isolated in accordance with the Technical Specifications. This condition did not affect either the initiating event frequency or a mitigation system. The change to the large early release frequency was considered because of the potential to establish a bypass path through the containment. Three factors were considered qualitatively in determining this condition and did not result in an appreciable change to the large early release frequency. The NRC staff found that the line through Penetration M-85 was not sufficiently large to result in a substantial increase in the large early release frequency. The period the penetration was actually open was of a relatively short duration. Lastly, the penetration could have been isolated using Valves PS-FV-4456 and AP-FV-2455 outside the containment.

Based on these factors, this was determined to be a violation of minor significance and is not subject to formal enforcement action. No other violations of NRC requirements were identified by the inspectors.

.5 (Closed) Licensee Event Report 499/2000-004: Circuit breaker trip due to improperly sized current transformers. This event was described in detail in Inspection Report 50-498;499/00-11. A noncited violation was issued in that report for inadequate design control. No additional safety issues were identified during the review of this report. Licensee corrective actions adequately addressed the root cause and the violation.

.6 (Closed) Licensee Event Report 498/2000-003: Class 1E battery inoperable longer than permitted by Technical Specifications. This event had no direct safety significance because a single battery cell had electrolyte level that was slightly above the limit, but this condition was not recognized due to confusion about the requirement. This condition did not prevent the battery from being able to perform its safety function, and as such constituted a violation of minor significance and is not subject to formal enforcement action.

.7 (Closed) Violation 50-498/1998015-02: Operators did not understand Technical Specification requirements for battery operability. The licensee clarified their understanding of the Technical Specification requirements for battery/charger operability. Plant procedures were modified accordingly. Operator training on the event and battery theory was completed. Corrective actions were adequate and no additional issues were identified.

4OA5 Review of World Association of Nuclear Operators Assessment of South Texas Project

The inspectors reviewed the report documenting the results of an assessment of South Texas Project conducted during the weeks of January 31 and February 7, 2000. The

results of that assessment were in general agreement with NRC assessments. No significant safety issues were identified during this review.

4OA6 Meetings including Exit Meeting

a. Management Meeting

On February 6, 2001, Commissioner J. Merrifield and Mr. E. Merschoff, Regional Administrator, Region IV toured the site. Commissioner Merrifield also held an open meeting with members of the licensee's staff.

b. Exit Meeting Summary

The results of the radioactive material processing and transportation inspection were presented to Mr. G. Powell, Manager, Health Physics, and other members of licensee management at the conclusion of the inspection on January 11, 2001. The licensee acknowledged the findings presented.

The results of the access control to radiologically significant areas inspection were presented to Mr. Joseph Sheppard, Vice President, Engineering and Technical Support, and other members of licensee management at the conclusion of the inspection on February 1, 2001. The licensee acknowledged the findings presented.

A telephone conference was conducted on February 8, 2001, with Mr. B. Mookhoek to further discuss the issues presented during the exit meeting for the access control to radiologically significant areas inspection.

The results of the Maintenance Rule implementation inspection were presented to Mr. W. Cottle, President and Chief Executive Officer, and other members of licensee management on February 9, 2001. The licensee acknowledged the findings presented.

The results of the evaluation of changes, tests, and experiments inspection were presented to Mr. J. Sheppard, Vice President, Engineering and Technical Support, and other members of licensee management on March 1, 2001. The licensee acknowledged the findings presented.

The results of the ALARA inspection were presented to Mr. T. Cloninger, Vice President, Generation, and other members of licensee management at the conclusion of the inspection on March 16, 2001. The licensee acknowledged the findings presented.

The results of the residents' inspections were presented to Ms. F. Mangan, Vice President, Business Services, and other members of licensee management at the conclusion of the inspection on April 3, 2001. The licensee acknowledged the findings presented.

In each case, the inspectors asked the licensee whether any materials discussed during the exit should be considered proprietary. No proprietary information was identified.

4OA7 Licensee Identified Violations

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

| NCV Tracking Number | Requirement Licensee Failed to Meet |
|---|---|
| 50-498/0014-03 | Instrumentation and Controls technicians connected test equipment to the wrong circuit card, causing control rods to automatically move outward one step. This caused a 5 MWth reactor power increase lasting 2 minutes before operators restored power to its previous level. Failure to follow Plant Surveillance Procedure 0PSP02-SI-0931 was a violation of Technical Specification 6.8.1. This violation is being treated as a noncited violation. Reference Condition Report 01-5375. |
| 50-498;499/0014-04 | 49 CFR 173.433 requires that shipping papers list 95 percent of the most abundant radionuclides based on their $A_2$ values (used to determine proper waste classification). On October 21, 1998, Radwaste Shipment 2-98-0035 consisting of 13 containers of surface contaminated objects did not list 95 percent of the most abundant radionuclides contained in the shipment, as described in the licensee's corrective action program, reference Condition Report 99-1913. |
| 50-499/0014-05 | Technical Specification 6.8.1 requires procedures for the radiation work permit system. Section 4.4 of Plant General Procedure 0PGP03-ZR-0051, "Radiological Access and Work Controls," Revision 13, states, in part, radiation workers will review and comply with applicable radiation work permit [requirements]. On March 8, 2001, six workers entered a high radiation area using a radiation work permit that did not allow entry into high radiation areas. On March 9, 2001, two workers entered an overhead area in the reactor containment building without contacting health physics personnel as required by their radiation work permit. On March 12, 2001, four workers entered an overhead area in the reactor containment building without contacting health physics personnel as required by their radiation work permit. These events are described in the licensee's corrective action program, reference Condition Reports CR01-3767, CR01-3951, and CR01-4135 (respectively). |

ATTACHMENT

Supplemental Information

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Aguilera, Health Physicist
P. Arrington, Licensing Specialist
T. Bowman, Manager, Unit 1 Operations
B. Bullard, Supervising Health Physicist
T. Cloninger, Vice President, Generation
K. Coates, Manager, Maintenance
W. Cottle, President and Chief Executive Officer
J. Crenshaw, Manager, Systems Engineering
R. Dally-Piggott, Licensing Specialist
W. Dowdy, Manager, Generation Support
R. Gangluff, Manager, Chemistry
T. Hall, Supervisor Performance Engineering
S. Head, Supervisor, Licensing
J. Johnson, Manager, Engineering Quality
T. Jordan, Manager, Engineering
W. Jump, Manager, Engineering
M. Lashley, Test/Programs
F. Mangan, Vice President, Business Services
M. McBurnett, Director, Quality and Licensing
W. Mookhoek, Licensing Engineer
M. Oswald, Supervisor, Engineering
G. Parkey, Plant General Manager
G. Powell, Manager, Health Physics
D. Rencurrel, Manager, Modifications and Design Basis Engineering
J. Sepulveda, Supervisor, Radiation Protection Radwaste
J. Sheppard, Vice President, Engineering and Technical Services
M. Smith, Manager, Plant Support-Quality
B. Stillwell, Risk Management
K. Taplett, Licensing Engineer
A. Tatham, Health Physicist
D. Towler, Manager, Generation Quality
J. Winters, Maintenance Rule Coordinator, Performance Engineering

NRC

W. Beckner, Chief, Technical Specification Branch, NRR
J. Calvo, Chief, Electrical and Instrumentation Branch, NRR
W. Jones, Senior Reactor Analyst, Region IV
S. Saba, Electrical and Instrumentation Branch, NRR
E. Tomlinson, Technical Specification Branch
M. Thadani, STP Project Manager, NRR

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

| | | |
|---|---|---|
| 50-499/0014-01 | NCV | Failure to inform workers of the storage of radioactive materials (Section 2OS2) |
| 50-499/0014-02 | NCV | Inadequate procedure for switching offsite power transformers (Section 4OA3.1) |
| 50-498/0014-03 | NCV | Failure to properly connect test equipment (Section 4OA7) |
| 50-498;499/0014-04 | NCV | Failure to list all required radionuclides on shipping papers (Section 4OA7) |
| 50-499/0014-05 | NCV | Failure to follow radiation work permit requirements (Section 4OA7) |

Closed

| | | |
|---|---|---|
| 50-499/0014-01 | NCV | Failure to inform workers of the storage of radioactive materials (Section 2OS2) |
| 50-499/0014-02 | NCV | Inadequate procedure for switching offsite power transformers (Section 4OA3.1) |
| 50-498/0014-03 | NCV | Failure to properly connect test equipment (Section 4OA7) |
| 50-498;499/0014-04 | NCV | Failure to list all required radionuclides on shipping papers (Section 4OA7) |
| 50-499/0014-05 | NCV | Failure to follow radiation work permit requirements (Section 4OA7) |
| 50-499/2000-004 | LER | Circuit breaker trip due to improperly sized current transformers (Section 4OA3.5) |
| 50-498/2000-003 | LER | Class 1E battery inoperable longer than permitted by Technical Specifications, one cell electrolyte level slightly out of specification (Section 4OA3.6) |
| 50-499/2000-001 | LER | Engineered Safety Feature (ESF) actuation due to Anticipated Transient Without a Scram Mitigation System Actuation Circuitry (AMSAC) (Section 4OA3.3) |

| | | |
|---|---|---|
| 50-498/2000-007 | LER | Unit 1 trip with safety injection (Section 4OA3.2) |
| 50-499/2000-003 | LER | Containment Penetration M-85 not properly isolated (Section 4OA3.4) |
| 50-498/1998015-02 | VIO | Operators did not understand Technical Specification requirements for battery operability (Section 4OA3.7) |

## LIST OF ACRONYMS USED

| | |
|---|---|
| ALARA | as low as reasonably achievable |
| AMSAC | Anticipated Transient Without a Scram Mitigation System Actuation Circuitry |
| CFR | Code of Federal Regulations |
| CR | Condition Report |
| DCP | Design Change Package |
| ESF | engineered safety feature |
| LER | Licensee Event Report |
| NCV | noncited violation |
| NRR | Office of Nuclear Reactor Regulation |
| RWP | Radiation Work Permit |
| SDG | Standby Diesel Generator |
| VIO | violation |
| WAN | Work Authorization Number |

## DOCUMENTS REVIEWED

The following documents were selected and reviewed by the inspectors to accomplish the objectives and scope of the inspection and to support any findings:

**Radioactive Material Processing and Transportation Inspection**

Procedures

| | |
|---|---|
| 0PGP03-ZO-0017 | “Radioactive Waste Process Control Program,” Revision 4 |
| 0PRP03-ZR-0001 | “Determination of Radioactive Material Curie Content, Reportability, DOT Sub-Type and Waste Classification,” Revision 6 |
| 0PRP03-ZR-0002 | “Radioactive Waste Shipments,” Revision 11 |
| 0PRP03-ZR-0011 | “Shipment of Radioactive Material,” Revision 4 |
| 0PRP03-ZR-0013 | “Receipt of Radioactive Material,” Revision 4 |
| 0PRP03-ZR-0003 | “Receipt Verification of High Integrity Containers,” Revision 3 |

0PRP03-ZR-0012 "Tracking and Loading of Spent Radioactive Filters into High Integrity Containers," Revision 3

0PRP03-ZR-0010 "Dry Active Waste Operation," Revision 6

0PRP04-ZR-0010 "Radiological Monitoring for New Fuel," Revision 6

Condition Reports

99-1911, 99-1913, 99-1918, 99-1921, 99-1929, 99-3604, 99-4123, 99-5569, 99-8826, 99-10923 99-14534, 99-15065, 99-15828, 00-915, 00-6415, 00-8220, 00-11263, 00-12105, 00-14793, 00-16074

Shipment Packages

1-99-0012, 2-99-0045, 2-99-0077, 2-00-0079, 2-00-0036, 1-00-0042, 2-01-0002

**Access Control to Radiologically Significant Areas Inspection**

Procedures

0PRP07-ZR-0010 "Radiation Work Permits," Revision 8
0PRP07-ZR-0009 "Performance of High Exposure Work," Revision 15
0PRP04-ZR-0015 "Radiological Posting and Warning Devices," Revision 9
0PRP04-ZR-0013 "Radiological Survey Program," Revision 9
0PRP03-ZR-0050 "Radiation Protection Program," Revision 3
0PRP03-ZR-0051 "Radiological Access and Work Controls," Revision 12
0PRP04-ZR-0011 "Radiation Protection Key Control," Revision 8
Conduct of Operations for Radiation Protection, Revision 0

Condition Reports

99-4637, 99-5456, 99-5459, 99-6136, 99-6389, 99-6118, 99-6686, 99-10031, 99-15504, 99-15678, 00-5404, 00-5898, 00-5938, 00-6051, 00-6826, 00-6861, 00-7055, 00-7742, 00-8615, 00-9635, 00-12224, 00-13054

Radiation Work Permits

1999-02-0352, 1999-01-0024, 1999-02-0280, 1999-02-0336, 1999-01-0167, 1999-01-0169, 1999-02-0338, 1999-02-0275, 2000-02-0127, 2000-01-0151

**Maintenance Rule Inspection**

Procedures

0PGP03-ZX-0002 "Condition Reporting Process," Revision 21

0PGP04-ZE-313 "Maintenance Rule Program," Revision 3
0POP-ZQ-0022 "Plant Operations Shift Routines," Revision 24

Miscellaneous Documents

Maintenance Rule Basis Document Guideline, Revision 4

Annual Summary Report of Maintenance Rule Activities 7/31/99 - 7/31/00, dated 08/29/00

Annual Summary Report of Maintenance Rule Activities 7/31/98 - 7/31/99, dated 08/05/99

Quality Surveillance Report 01-002, System Engineering Department Maintenance Effectiveness Assessment, dated 01/31/01

Quality Surveillance Report 99-020-Review of Maintenance Rule Program, dated 06/16/99

Risk and Reliability Analysis Group Self-Assessment CR-15479, Maintenance Rule (a)(4) Implementation for Shutdown, dated 11/14/00

Plant Operations and Work Control Self-Assessment CR 00-12245, Configuration Risk Management Program, dated 10/02/00

Conditions Reports

00-468, 00-5776, 00-11389, 00-12245, 00-12318, 00-14215, 00-14548, 00-14550, 00-15479, 99-3526, 99-5124, 99-5953, 99-10606, 99-12196, 99-13724, 99-13725, 99-15935, 99-17050

Work Authorization Numbers (WAN)

72265, 141138, 158771, 165282, 165282, 165836, 167567, 168514, 169011, 171287, 176747**,** 179234, 180687, 189448, 192771

Maintenance Rule Expert Meeting Minutes

Dates:

| | | | | |
|---|---|---|---|---|
| 08/27/98 | 03/22/99 | 07/31/99 | 01/26/00 | 07/26/00 |
| 09/24/98 | 05/18/99 | 08/26/99 | 02/23/00 | 08/23/00 |
| 11/19/98 | 06/30/99 | 09/30/99 | 04/12/00 | 11/30/00 |
| 01/28/99 | 07/22/99 | 12/02/99 | 06/28/00 | 01/24/01 |

Control Room Logs

| UNIT 1 Dates: | UNIT 2 Dates: |
|---|---|
| 08/16-21/99 | 08/01-05/99 |
| 09/14-16/99 | 09/01-04/99 |
| 10/08-17/99 | 09/24-28/99 |

**10 CFR 50.59 Safety Evaluation Inspection**

Procedures

0PGP03-ZX-0002 "Condition Reporting Process," Revision 21
0PGP05-ZA-0002 "10CFR50.59 Evaluations," Revision 10

Miscellaneous Documents

Engineering Self-Assessment 00-15088, Engineering Activities, dated 11/14/00

Monitoring Report Number MN-00-0-1324, Pressurizer Pressure Transmitter Replacement, dated 11/08/00

Monitoring Report Number MN-00-1-0849, Fuel Load Concerns-Engineering Resolutions, dated 4/28/00

Monitoring Report Number MN-99-2-1187, Review of 2RE07 Temporary Modifications, dated 10/25/99

Quality Audit Report 99-07 (DE) Design Control, dated 7/27/99

10 CFR 50.59 SAFETY EVALUATIONS, UNREVIEWED SAFETY QUESTION EVALUATIONS (USQEs)

USQE No. / Revision

00-16902-6 / 0
00-8096-2 / 0
00-3229-6 / 0
00-3225-4 / 0
99-2087-9 / 0
99-2042-3 / 0
99-196-2 / 0
98-18127-15 / 0
98-622-18 / 0
97-6297-7 / 0
96-12589-2 / 0

96-9330-5 / 0
93-0018 / 0

10 CFR 50.59 Screenings For Design Change Package / Revision

00-18765-3, Supplement 0 / 0
00-16233-2 / 0
00-10216, Supplement 0 / 0
00-5286-1, Supplement 0 / 0
99-2106-11, Supplement 0 / 0
99-359-3, Supplement 0 / 0
98-19051-2 / 0
98-17433-2, Supplement 0 / 0
98-17156-3 / 0
98-14455-2 / 0
97-13746-20, Supplement 0 / 0
97-7523-3 / 0

10 CFR 50.59 Screenings For Temporary Modification Package / Revision

T2-00-4944-1 / 0
T2-99-16610-14 / 0
T2-99-10606-8 / 0

Condition Reports

01-2487, 01-2473, 01-2471, 01-2470, 01-2330, 01-1019, 01-514, 00-18931, 00-17944, 00-17371, 00-13678, 00-11945, 00-10391, 00-10323, 00-8193, 00-8192, 00-6334, 00-4966, 00-846, 99-15763, 99-12469, 96-9998, 94-1377

**ALARA Inspection**

Procedure

0PGP03-ZR-0051 “Radiological Access and Work Controls” Revision 13