APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-382/94-19

Operating License: NPF-38

Licensee: Entergy Operations, Incorporated
P.O. Box B
Killona, Louisiana 70066

Facility Name: Waterford Steam Electric Station, Unit 3

Inspection At: Waterford Steam Electric Station, Unit 3

Inspection Conducted: August 21 through October 1, 1994

Inspectors: E. J. Ford, Senior Resident Inspector
T. W. Pruett, Resident Inspector
K. W. Weaver, Reactor Inspector

Approved: _____ 10-19-94
C. A. VanDenburgh, Chief, Project Branch D Date

Inspection Summary

Areas Inspected: Routine, unannounced, resident inspection of plant status, plant operations, maintenance and surveillance observations, plant support activities, onsite engineering, followup actions in plant operations and engineering, and review of licensee event reports.

Results:

Plant Operations

- The licensee's operating performance declined from the last inspection period based on the continued inability to control evolutions affecting the chemical volume and control system (Section 2.1.2).

- The failure of auxiliary operators and fire patrols to observe and initiate the removal of oily wipes from Emergency Diesel Generator Room A is a violation of Administrative Procedure UNT-007-006 (Section 2.2.2).

- Inadequate process radiation monitoring procedures contributed to the unplanned effluent release of radioactive material in violation of Technical Specification 6.8.1.a. Additionally, the failure to ensure Condensate Makeup Valve CMU-901 was open prior to initiating flow indicates that inadequate purging of radiation monitors may have occurred (Section 2.2.5).

Maintenance

- The inspectors noted that observed maintenance activities utilized appropriate equipment tagouts and maintenance personnel were familiar with assigned tasks. Additionally, the questioning attitude during the High Pressure Safety Injection Pump B maintenance was considered a good maintenance practice (Section 3.1).

Engineering

- The licensee's evaluation of charging pump oil leakage was considered a strength (Section 6.1). Observations of special test procedures indicated that the conduct of pre-job briefings, communications during testing, and command and control of tests were strengths (Section 4.1).

- The construction of scaffolding in contact with insulation surrounding safety-related piping was considered a poor scaffolding erection practice (Section 6.3).

Plant Support

- The inspectors noted a decline in the performance of the health physics staff since the last inspection period based on inconsistent labeling of contaminated components (Section 5.2), an inadequate evaluation of increased dose equivalent iodine levels (Section 5.3), and the failure to perform flow velocity testing of the primary sample panel (Section 5.4).

Summary of Inspection Findings:

Violation 382/9419-01 was opened (Section 2.2.2).
Violation 382/9419-02 was opened (Section 2.2.5).
Violation 382/9419-03 was opened (Section 5.4).
Inspector Followup Item (IFI) 382/9419-04 was opened (Section 6.4).
A second example of violation 382/9424-01 was opened (Section 2.1.2).
Inspection Followup Item 382/9333-01 was closed (Section 8.1)
Violation 382/9333-02 was closed (Section 8.2).
Violation 382/9333-03 was closed (Section 8.2).
IFI 382/9408-02 was closed (Section 8.3).
Licensee Event Report 382/93-004 was closed (Section 9.1).

Attachment:

- Persons Contacted and Exit Meeting

## DETAILS

### 1 PLANT STATUS

On September 16, 1994, the licensee inadvertently borated the reactor coolant system and reactor power was reduced to 98.5 percent to stabilize cold leg temperature at 545°F. Reactor power was lowered on September 24, 1994, to 90 percent to support turbine valve testing. The plant operated at essentially 100 percent power for the remainder of the inspection period.

### 2 PLANT OPERATIONS (71707)

The objectives of this inspection were to ensure that the facility was being operated safely and in conformance with regulatory requirements, to ensure that the license's controls were effective in achieving continued safe operation of the facility, to independently verify the status of the plant systems, and to evaluate the effectiveness of the licensee's self-assessment programs.

#### 2.1 Control Room Observations

##### 2.1.1 Cold Leg Temperature Technical Specification Logs Revised

Technical Specification 3.2.6 requires that cold leg temperature be maintained greater than or equal to 544°F. During routine walkdowns of control room panels the inspectors noted that the cold leg temperature for Loop 2A on Safety Measurement Panel A indicated 543°F and that the remaining seven indications were 545°F to 546°F. The nuclear plant operator stated that a recent change had been made to Operating Procedure OP-903-001, "Technical Specification Surveillance Logs," which changed the requirement from each cold leg temperature instrument indicating greater than or equal to 544°F to the average cold leg temperature indicating greater than or equal to 544°F. The licensing staff provided the inspectors with a letter, dated May 16, 1994, from Combustion Engineering to the licensee, which stated that the revised monitoring procedure for cold leg temperatures would provide a high degree of confidence that the plant is operated within the conditions specified in the safety and setpoint analyses. The inspector had no further concerns.

##### 2.1.2 Inadvertent Boron Addition Event

On September 16, 1994, the licensee informed the NRC that an inadvertent addition of boric acid to the reactor coolant system instead of the volume control tank (VCT) had occurred. The nuclear plant operator was performing a make-up to the volume control tank in accordance with Operational Procedure OP-002-005, Section 6.11, "Make-up to the VCT Using the Borate Make-up Mode," when several annunciator alarms due to ground testing were received. The operator exited from the procedure by returning Direct Boration Valve BAM-143 to the auto position and responded to the annunciator alarms. When the operator returned to the procedure, he failed to return Valve BAM-143 to the closed position prior to placing the makeup mode selector switch to the

borate position. Placing the mode selector switch to the borate position started the boric acid pump and opened Valve BAM-143. This allowed approximately 40 gallons of boric acid to be added directly to the reactor coolant system. The operator recognized his mistake and appropriately informed the control room supervisor. As compensatory action, the operating crew lowered turbine power to maintain reactor coolant system temperature consistent with turbine load. Reactor power was stabilized at 98.5 percent power and reactor coolant system cold leg temperature was stabilized at 545°F.

The licensee's event review team determined that the root causes for the inadvertent boric acid addition were the operator's failure to properly adhere to procedural steps while performing make-up to the volume control tank and the failure to practice self-checking techniques to ensure intended components are in the correct position. Contributing factors included annunciator ground testing which distracted the operator from the reactivity manipulation, the operator had been licensed for only six months, the chemical volume and control system procedure was not in continuous use, and the procedure contained numerous steps.

The licensee's immediate corrective actions for the inadvertent boration included issuance of a daily instruction which required that: 1) during any boric acid, water, or blending evolution, the operator will have the chemical and volume control system procedure in-hand; 2) during any rod shim the operator will have the control element drive mechanism control system procedure in-hand, and 3) the control room supervisor or the shift supervisor will directly observe any reactivity control evolution.

The inadvertent boration to the reactor coolant system is the fourth example since June 7, 1994. These continuing failures reflect the licensee's difficulty in performing evolutions affecting reactivity using the chemical and volume control system. Reactor coolant system boron dilution events which occurred on June 7 and July 20, 1994, were previously discussed in NRC Inspection Report 50-382/94-24. A job-performance measure, failure of a licensed operator involving boron calculations during an NRC-monitored requalification examination, is also described in NRC Inspection Report 50-382/94-12. The inadvertent boration to the reactor coolant system which resulted from the failure of the operator to perform the steps of Procedure OP-002-005, Section 6.11, "Make-up to the VCT Using the Borate Make-up Mode," in the sequence it was written is a second example of Violation 382/9424-01 described in NRC Inspection Report 50-382/94-24.

## 2.2 Plant Tours

### 2.2.1 Emergency Feedwater System Walkdown

The inspectors performed a walkdown of the emergency feedwater system and determined that the system had been aligned in accordance with Operating Procedure OP-009-003, "Emergency Feedwater."

2.2.2 Emergency Diesel Generator Room (EDG) A Housekeeping

Technical Specification 6.8.1.a requires, in part, that written procedures be established, implemented, and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, Item 1, requires that the licensee establish procedures for administrative controls. Administrative Procedure UNT-007-006, Revision 6, Section 5.5.1, "Housekeeping," requires, in part, that garbage, trash, scrap, litter, and other routine excess materials be collected and disposed of in a timely manner. On September 8, 1994, during a walkdown of EDG A, the inspectors noted the presence of several oil-saturated wipes (adsorbents) on the EDG A lube oil cooler, oil strainer outlet piping, and flooring below the lube oil strainer outlet piping. The inspectors noted that the source of the oil leakage was from the turbo lube oil filter assembly. This leakage had been noted by the licensee and documented with Condition Identification Tag 292354.

The shift supervisor and control room supervisor stated that the auxiliary operators should have noticed the oil-soaked wipes during previous walk downs of the EDG and directed clean-up personnel to remove the oily wipes. The inspectors also noted that EDG Room A had been scheduled for hourly fire patrols in accordance with Fire Impairment Tag 92-313. The contract security supervisor, security supervisor, and several security officers stated that fire watches performing hourly tours of these spaces should be alert for oily wipes and other forms of combustible materials and that fire patrols are expected to report the presence of oily wipes to their supervisor so that arrangements can be made for their removal.

The inspectors observed that the crystallization of oil on the wipes, combined with the seepage of oil from the wipes, indicated that the wipes had not been removed by cleaning personnel for an extended period of time. Discussions with fire protection personnel and a review of combustion information disclosed that the oily wipes posed no significant fire hazard. The failure of auxiliary operators and fire patrols to observe and initiate the periodic removal of oily wipes from EDG Room A is a violation of Administrative Procedure UNT-007-006 (Violation 382/9419-01).

2.2.3 Potential Contamination of Tygon Hose on Low Pressure Safety Injection (LPSI) Suction Line

During a plant tour on September 14, 1994, the inspectors noted that a discolored (dark red) tygon hose was attached to a valve on the LPSI suction line. The inspectors were concerned that the discoloration may be due to chemical contamination of the fluid in the tubing. The licensee analyzed the fluid and determined that it was from the refueling water storage pool and had no chemical abnormalities. The licensee indicated that the tygon hose had been connected for a long period of time and that either the age of the hose or high temperatures could have caused the discoloration. The inspectors considered the licensee's response to the discolored hose to be timely and thorough.

2.2.4 Containment Leak Rate Penetrations

During tours of the reactor auxiliary building the inspectors noted that two outside containment penetration lines for containment leak-rate test connections had different containment isolation controls (i.e., one locked closed valve per line versus two locked closed valves per line). The inspectors reviewed the design and the test connection flow diagram to ensure that adequate requirements for the containment penetration lines existed. The line with a single locked closed valve outside containment was blind-flanged inside containment. The other test connection line was directly connected to the containment atmosphere inside containment and contained two manual locked closed valves in series outside containment. Additionally, test connection containment isolation valves are administratively controlled by licensee procedures. Therefore, the inspectors concluded that the licensee had adequate containment isolation controls for leak test connections.

2.2.5 Inadequate Process Radiation Monitor System Operating Procedure

On May 3, 1994, circulating water Monitor PRM-IRE-1900 alarmed as a result of contaminated condensate makeup (CMU) water leakage past the circulating water radiation monitor purge isolation valve PRMMVAAA014-012. The licensee initially thought that the circulating water radiation monitor had malfunctioned because samples of the circulating water system did not indicate the presence of radioactivity. On May 12, 1994, the licensee sampled the circulating water radiation monitor effluent and detected the presence of Cobalt-58 but was unable to determine the source of the radioactivity. On May 13, 1994, the licensee again detected the presence of radioactivity in the CMU system and isolated the CMU purge isolation valve on the circulating radiation water monitor.

Based on discussions with the health physics staff, the inspectors concluded that the licensee inadvertently depressurized the CMU header downstream of the fuel handling building demineralized water supply header isolation Valve CMU-901 to less than the discharge pressure of the containment sump pump while attempting to purge radiation monitors with CMU water. Because the containment sump pump discharge pressure (75 psig) was greater than CMU pressure (normally greater than 90 psig), radioactive liquid leaked from the containment sump past the purge isolation valve into the CMU system. After completing the attempted radiation monitor purges the CMU header would repressurize to normal pressure. The repressurization combined with the leakage past the circulating water radiation monitor purge isolation Valve PRMMVAAA014-012 resulted in the unplanned radioactive effluent release between May 3 and 13, 1994.

The licensee initiated Condition Report 94-498 to investigate the cause of the unplanned release. The licensee determined that Valve CMU-901 was required to be shut per Operating Procedure OP-003-004, Revision 7, "System Operating Procedure, Condensate Makeup," even though the plant drawing indicated that the valve was normally open. Additionally, Operating Procedure OP-004-001, Revision 5, "Radiation Monitoring," did not specify that Valve CMU-901 was

required to be open to establish purge flow for downstream radiation monitors. The licensee initiated repair activities to replace the two leaking radiation monitor purge isolation valves and revised Operating Procedure OP-003-004, Attachment 11.1, to change the required valve position for Valve CMU-901 from closed to open.

Technical Specification 6.8.1.a requires, in part, that written procedures be established, implemented, and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, Item 1.g, requires that the licensee establish procedures for process radiation monitoring system operation. The failure to provide adequate process radiation monitoring procedures to ensure that Valve CMU-901 was open while purging downstream radiation monitors resulted in the CMU header depressurization and is a contributing factor in the radioactive effluent release. Additionally, the failure to ensure Valve CMU-901 was open prior to initiating purge flow indicates that inadequate purging of the radiation monitors may have occurred. The failure to provide adequate process radiation monitoring procedures is a violation of Technical Specification 6.8.1.a (Violation 382/9419-02).

2.3 Conclusions

The inadvertent boration to the reactor coolant system which resulted from the failure of the operator to perform the steps of Operating Procedure OP-002-005, Section-6.11, "Make-up to the VCT Using the Borate Make-up Mode," in the sequence written is a second example of Violation 382/9424-01 described in NRC Inspection Report 50-382/94-24.

The failure of auxiliary operators and fire patrols to observe and initiate the removal of oily wipes from EDG Room A is a violation of Administrative Procedure UNT-007-006.

Inadequate process radiation monitoring procedures contributed to the unplanned effluent release of radioactive material and is a violation of Technical Specification 6.8.1.a. In addition, the failure to ensure Valve CMU-901 was open prior to initiating flow indicates that inadequate purging of the radiation monitors may have occurred.

## 3 MAINTENANCE OBSERVATION (62703)

The maintenance activities addressed below were observed and documentation reviewed to verify that maintenance activities for safety-related structure, systems, and components were conducted in a manner which resulted in reliable safe operation of the plant and plant equipment.

3.1 Maintenance Observations

| Work Authorization | Task |
|---|---|
| WA 01126772 | High Pressure Safety Injection Pump B (HPSI) Change Motor and Pump Bearings Lubricant, Lube Coupling |
| WA 01127760 | HPSI Pump AB Discharge Check Valve, Rework Valve, Seat Leakage Contributing to Safety Injection Tank (SIT) Leakage |

The inspectors had no adverse observations and noted during the observed maintenance activities that appropriate equipment tagouts were performed and that maintenance personnel were familiar with the assigned tasks. In addition, maintenance personnel displayed a questioning attitude and a high level of attention to detail by contacting and questioning engineering personnel about cloudy lubricating oil prior to continuing work activities on the B HPSI pump.

## 4 SURVEILLANCE OBSERVATION (61726)

The inspectors observed the surveillance testing of safety-related systems and components listed below to verify that the activities were being performed in accordance with the licensee's approved programs and the Technical Specifications.

4.1 Surveillance Observations

| Procedure | Title |
|---|---|
| STP-01127424 | Test of Boric Acid Make-up Flow |
| STP-01127968A | EDG AB Components |
| STP-01127968B | Load Shedding and Automatic Starting of 4160 and 480 Volt AB Components |

The inspectors had no adverse observations and concluded that the special test procedure pre-job briefings, communications, and command and control were strengths.

## 5 PLANT SUPPORT ACTIVITIES (71750)

The objectives of this inspection were to ensure that selected activities in the different areas of plant support were implemented in conformance with the facility policies and procedures and in compliance with regulatory requirements.

5.1 Leaking Radflex Seal

During a tour of safeguards pump Room B, the inspectors noted that the radflex material (silicon/lead gel) for Fire Seal 1A0157 was leaking. The radflex seal is used to protect against fire, water, and radiation. The inspectors

observed that approximately 30 additional seals in the area were intact indicating that Fire Seal 1A0157 was an isolated occurrence. The shift supervisor initiated Fire Impairment Tag 94-486 and directed the fire watch group to begin hourly tours of safeguards pump Room B. Additionally, the shift supervisor contacted the fire protection group and requested that they perform an inspection of the fire seal. The fire protection group noted that there was a tear in the fire seal and initiated Condition Identification Tag 292999 for replacement or repair of the fire seal. The fire protection group stated that the seal was operable because there appeared to be an adequate amount of gel remaining in the boot.

5.2 Inadequate Labeling of Potentially Contaminated Container

During tours of the -35 foot elevation wing area, the inspectors noted that an open stainless steel container and filter assembly used with circulating water radiation Monitor RE-CW-1900 was not labeled as potentially contaminated even though the tygon tubing upstream and downstream of the container was marked as internally contaminated. The shift supervisor contacted health physics which determined that the external contamination levels were less than 1,000 dpm and removed the labels from the tygon tubing.

The inspectors questioned the health physics supervisor to determine why the tubing and not the container had been labeled as contaminated. The health physics supervisor stated that between May 3 and 13, 1994, contaminated water from the condensate make-up system, which supplies flushing water to circulating water radiation Monitor PRM-IRE-1900, had leaked into the monitor. Because of the leakage into the circulating water system, the radiation monitor tubing was labeled as internally contaminated. This issue was documented by the licensee in Condition Report 94-498 and will be reported to the NRC in the facility's annual radioactive effluent release report. Based on discussions with the health physics supervisor, it appears that the failure to label the container and filter assembly as potentially contaminated was a personnel oversight. The failure to label the container and filter as potentially contaminated is considered a poor health physics practice.

5.3 Elevated Dose Equivalent Iodine (DEI)

During Cycle 6 operations the plant operated at higher than normal DEI levels due to a suspected fuel pin leak. DEI is the concentration of Iodine-131 which would produce the same thyroid dose as the quantity and isotopic mixture of Iodine-131, 132, 133, 134, and 135 actually present. The peak DEI level noted was 1.39E-1 uCi/gram with a steady state value of approximately 1.25E-2 uCi/gram. The inspectors questioned the health physics supervisor to determine if any additional controls or increased monitoring had been considered or performed to determine if the chemistry technicians sampling and analyzing primary coolant samples might intake higher levels of radioactive iodine. The health physics supervisor stated that the intake of iodine by chemistry technicians had not been evaluated and that provisions had not been established to increase monitoring requirements for chemistry technicians.

As a result of the inspectors' questioning, the health physics supervisor selected five chemistry technicians to receive a whole body count, directed that calculations be performed to evaluate the potential radiological hazard from worst case and most probable scenarios, added a requirement to the radiation work permit for sampling from the primary sample panel to include wearing of lapel air samplers when DEI levels reach 0.1 microcuries per cubic centimeter, and realigned the suction of the continuous air monitor from the corner of the chemistry lab to the front of the primary sample panel.

The licensee's assumptions for the worst case calculations were: (1) 100 percent of the iodine becomes airborne, (2) no credit for ventilation was applied, (3) one chemistry technician performs an analysis on a 250 ml reactor coolant sample each day for one year, (4) DEI equalled the highest recorded value of 0.139 uCi/ml, and (5) no respirators are worn. Using the equation:

I(iodine) = C(iodine)*Breathing Rate*time,

from Regulatory Guide 8.34, "Monitoring Criteria and Methods to Calculate Occupational Radiation Doses," the following worst case dose was determined to be 0.062 uCi/day or 22.6 uCi/year.

The licensee then provided calculations which took credit for ventilation dilution, six chemistry technicians performing the sample analyses, and only ten percent of the DEI becoming airborne. The licensee estimated that the intake could be lowered by 0.1333 based on the turnover rate of the ventilation system (one room change approximately every 1.95 minutes). Applying these assumptions lowers the DEI intake to 0.05 uCi/year/chemistry technician.

The inspectors questioned the chemistry supervisor to determine the actual volume and number of samples analyzed per week. The inspectors determined that approximately 350 ml is analyzed per day under normal circumstances and that until recently DEI trending samples were performed two or three times per day. The increased sample frequency would raise the total sample volume to approximately 700 ml/day (not all analyses are repeated for DEI trending). The increased sample volume raises the DEI intake from 0.05 to 0.14 uCi/year. If the DEI levels were to increase from 1.39E-1 uCi/gram to the Technical Specification value of 1.0 uCi/gram, the iodine intake would increase to 1 uCi/year.

The inspectors verified the licensee's assumptions for ventilation dilution by reviewing plant drawings to determine the actual flow rates for the sample laboratory. The inspectors also attempted to verify that the fume hoods located in the sample laboratory, which were used to determine the ventilation dilution factor, had been properly tested. Based on discussions with health physics personnel, the inspector determined that the primary sample panel face velocity had not been previously tested by the licensee (See Section 5.4).

Based on the licensee's calculations, the inspector concluded that chemistry technicians would not have exceeded 10 percent of the 50 microcurie annual limit on intake, thereby obviating the need to provide monitoring. However, the inspectors were concerned that the health physics staff had not performed a formal evaluation to determine which individuals would most likely be impacted by increasing DEI levels (changing radiological conditions) in the plant.

5.4 Primary Sample Panel Testing

As discussed in the preceding section, based on observations of the primary sample panel and discussions with members of the health physics staff, the inspector determined that the primary sample panel had not been tested to determine the minimum face velocity as of September 27, 1994. The licensee stated that they had not considered the primary sample panel to be a fume hood which required testing because it did not have a separate ventilation supply, the sash is horizontal instead of vertical, and no personal contaminations of chemistry technicians had been noted due to improper controls while working in the primary sample panel. On September 28, 1994, the licensee verified that the face velocity flow rates met the criteria specified in Health Physics Procedure HP-002-606.

Technical Specification 6.8.1.a requires, in part, that written procedures be established, implemented, and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, Item 7.e, requires that the licensee establish procedures for radiation protection. Health Physics Procedure HP-002-606, Revision 1, "Fume Hood Capture Velocity," provides instructions for monitoring and calculating the capture velocity for fixed and adjustable sash fume hoods. Section 9.0 requires, in part, that the minimum capture velocities for the fume hoods in the sample laboratory be 150 fpm average and 125 fpm minimum. Section 6.0 specifies that fume hoods should be tested quarterly.

The inspectors concluded that the primary sample panel performs the same safety function as the remaining two fume hoods in the radiochemistry laboratory. Specifically, each component maintains a face air velocity to prevent an individual working in the hood or panel from becoming contaminated or intaking radioactive material. The fact that the primary sample panel does not have the exact same characteristics as other fume hoods in the same space does not obviate the need for flow rate testing. The failure to perform face velocity flow tests for the primary sample panel is a violation of Health Physics Procedure HP-002-606 (Violation 382/9419-03).

5.5 Conclusions

The failure to detect and remove combustible materials from the EDG Room A is a violation of Procedure FP-001-004, Section 6.4.4.

The failure to label the circulating radiation monitor container and filter assembly as contaminated is considered a poor health physics practice. In

addition, the inspectors were concerned that the health physics staff did not perform a formal evaluation to determine which individuals would most likely be impacted by increasing DEI levels (changing radiological conditions) in the plant. The failure to perform face velocity flow tests for the primary sample panel is a violation of Health Physics Procedure HP-002-606.

## 6 ONSITE ENGINEERING (37551)

The objectives of this inspection were to provide periodic engineering evaluations for Regional assessment of the effectiveness of the onsite engineering staff.

### 6.1 Charging Pump Oil Leakage

During routine tours of the charging pump rooms, the inspectors noted that the oil leakage from charging Pump B was greater than charging Pumps A and AB. The inspectors questioned the maintenance engineer to determine if the oil leakage was excessive. The maintenance engineer inspected the charging pump and initiated Condition Identification Tag 292878 to adjust the charging pump crosshead packing. Additionally, the maintenance engineer stated that changes had been made to the charging pump gasket material and breather element arrangement to minimize oil leakage and that Work Authorization 01125029 had been written to replace the existing crosshead oil seals with a lip seal during the next scheduled replacement of the oil seals.

The maintenance engineer provided the inspectors with charging pump performance data which indicated that charging Pump B run time hours per quart of oil added were lower than charging Pumps A and AB. The hours of run time per quart of oil usage for charging Pump B had decreased from 21 hours per quart of oil in June 1994 to 11.4 hours per quart in August 1994. The inspectors reviewed the run time records and determined that the amount of oil leakage did not effect the pump's operability. The efforts made by the maintenance engineer to detect and correct excessive oil leakage from the charging pumps was considered a good engineering practice.

### 6.2 Safety Injection Tank (SIT) Leakage

The inspectors noted during routine observations of control room operations that SIT 1A was repressurized with nitrogen or refilled with borated water approximately 10 times a shift due to leakage from SIT 1A. Engineering evaluated the possible leak paths by performing ultrasonic testing and by sampling the reactor drain tank. Leakage pathways included high pressure safety injection pump discharge check valves, the SIT drain line to the refueling water storage pool, and the SIT drain line to the reactor drain tank. The licensee inspected and repaired HPSI discharge check Valves SI-207AB and 207A on September 14 and 20, 1994, respectively. The licensee's evaluation of the effectiveness of these repairs indicated that there was no substantial reduction in the leakage rate from SIT 1A.

On September 29, 1994, the licensee entered the containment building and shut the SIT drain header to refueling water storage pool Valve SI-3432. The initial trending data indicated that shutting Valve SI-3432 effectively isolated the leakage path from SIT 1A.

6.3 Improper Construction of Scaffolding

During tours of the -35 foot elevation wing area, the inspectors noted that scaffolding for Permit 16120 was in direct contact with the insulation surrounding piping for the containment spray header. When informed, the shift supervisor directed personnel to move the scaffolding from the insulating material.

The inspectors questioned the construction and modifications group supervisor to determine why the scaffolding had been constructed in contact with the insulation for a safety-related system. The supervisor stated that scaffolding erection procedures required that the scaffold be built greater than one inch from safety-related piping and equipment, that scaffolding could be placed in contact with insulating material provided the insulation surrounding the piping was greater than one inch, and that design engineering informed him that it was acceptable to place scaffolding in contact with insulating materials surrounding safety-related materials because movement of the scaffolding would crush the insulation and not effect the piping. Additionally, the construction and modifications group supervisor stated that efforts were made to ensure that scaffolding was not built in contact with any insulating material. The inspector had no further concerns in this area.

6.4 HPSI Pump Lubrication Engineering Evaluation

During maintenance activities performed on HPSI Pump B, the inspectors and maintenance personnel noted that the new lubricating oil installed in the pump was cloudy and did not look like new lubricant. The maintenance personnel stopped work and immediately contacted the lubrication engineer. The lubrication engineer took a sample of the cloudy lubricating oil and instructed the maintenance personnel to changeout the lubricant again using a different oil container. After replacement, the maintenance personnel and the inspectors again noted that the lubricating oil was cloudy. The lubricating engineer instructed the maintenance personnel to stop work while he performed a simplified viscosity test on the lubricating oil. Based on the test, the engineer instructed the maintenance personnel to leave the cloudy oil in the HPSI pump.

The inspectors were concerned that the oil was possibly contaminated and questioned the engineer concerning the practice of leaving the cloudy oil in the HPSI pump, since it did not have the appearance of new oil. The inspectors also questioned the engineer concerning whether a chemical analysis would be performed on the oil or if the vendor would be contacted to determine if the oil was acceptable for use. The engineer stated that the vendor would not be contacted and that based on his simplified viscosity test the cloudy oil was acceptable for use in the HPSI pump.

The inspectors reviewed licensee Procedure UNT-005-007, "Plant Lubrication Program," and Technical Manual 457001150, "Plant Lubrication Manual." Based on the inspectors' review, there were no procedural requirements for a chemical analysis or for communications with the vendor in the event that new lubricating oil appeared potentially contaminated.

Subsequent to the inspectors' review, the licensee initiated a condition report, disposed of the remainder of the cloudy oil supply, and sent five oil samples from the transfer containers to a laboratory for analysis. The licensee chose to leave the lubricating oil in HPSI Pump B despite the cloudy appearance. The results of the laboratory analysis for the cloudy oil indicated that the five samples contained a high content of zinc. The vendor was contacted and indicated that the upper limit for zinc was 5 ppm and that based on the high zinc content, the oil could possibly be contaminated with another type or grade of oil. Even though the vendor analysis indicated the potential for contamination of the oil, the licensee's lubricating engineer determined that the operability of the pump would not be affected. Although the licensee's initial evaluation considered the pump operable, this issue will be followed as an open item pending further review of HPSI pump oil sample analyses and licensee condition reports (Inspector Followup Item 382/9419-04).

6.5 Inoperable EDG due to Alignment of Non-Tested AB Electrical Loads

On September 7, 1994, the licensee informed the inspectors that Train AB components had not been tested during the 18-month integrated load testing of the diesel generators. During integrated load testing, Train AB was aligned to the train which was not being tested. Therefore, only Trains A and B were tested with their respective diesel generator. The licensee declared EDG B inoperable because Train AB was electrically aligned to Train B and the required integrated testing of Train AB components had not been performed within 18 months. The licensee requested enforcement discretion to extend a 72-hour shutdown limiting condition for operation to seven days and submitted an emergency Technical Specification change to allow a modification of the integrated load test requirement until the next planned refueling outage in September 1995.

On September 16, 1994, NRR granted approval of the emergency Technical Specification change. The licensee declared EDG B operable and tagged out High Pressure Safety Injection Pump AB, Charging Pump AB, Essential Services Chiller AB, Component Cooling Water Pump AB, and the computer back-up power supply until individual component testing indicated that these loads could be aligned to either Trains A or B. This issue will be the subject of NRC Special Inspection Report 50-382/94-25.

6.6 Conclusions

The efforts made by engineering to detect and correct excessive leakage from the charging pumps was considered a strength. An unresolved item involving HPSI pump lubricating oil was opened.

## 7 FOLLOWUP - PLANT OPERATIONS (92901)

### 7.1 Management Presence in Plant

Systematic Assessment of Licensee Performance (SALP) Report 93-99 documented a concern that nuclear safety, design, and training management representatives were not spending an adequate amount of time evaluating in-plant activities. The inspectors discussed this concern with licensee management personnel and determined that an effort has been made by some individuals in the nuclear safety and design areas to increase the amount of time devoted to monitoring plant activities. The inspectors attempted to independently verify the increased plant observation activities of management personnel through the use of security card reader history reports and radiological control entry data. The inspectors were unable to independently verify plant activities and evaluations which may have been performed in spaces that do not require a security card entry (e.g. turbine building and shop spaces).

Based on a review of security card reader history reports dated between January 1 and July 1, 1994, and radiological area access control reports dated between January 1 and September 1, 1994, it appears that certain nuclear safety and design engineering management representatives have not periodically entered the control room and radiological controlled areas. In addition, the inspectors noted that the training manager had not entered the control room for a six month period and is not monitored for exposure by health physics. The inspectors encouraged the licensee to evaluate the amount of time managers should utilize performing evaluations in the control room and radiological controlled areas. This amount of management oversight in the plant will continue to be monitored during routine plant tours.

## 8 FOLLOWUP - ENGINEERING (92903)

### 8.1 (Closed) Inspection Followup Item 382/9333-01: Unexpected Pressure Surges due to Air Entrapment

Inspection Followup Item 382/9333-01 involved the licensee's planned evaluation of the containment spray system's nominal design pressure rating and hydrostatic test pressure. The licensee's consultant performed an evaluation to determine if the containment spray system piping design and hydrostatic test pressures needed to be adjusted. The evaluation concluded that no design change or rerating was necessary because the pressure increase was treated as an operational test transient, the line would not be yielded by the transient, and the observed pressure excursion did not exceed the ASME Section III allowable stresses for the piping nor the standard temperature/pressure ratings for the flanges, fittings, and valves.

### 8.2 (Closed) Violations 382/9333-02 and 382/9333-03: Failure of Containment Spray Valve CS-125A

Violation 382/9333-02 involved the inoperability of the containment spray system because containment spray header isolation Valve CS-125A would not have

opened under all circumstances. Violation 382/9333-03 involved the inadequate corrective measures taken by the licensee to preclude repetition of the failure of Valve CS-125A to stroke open with a high differential applied across the valve and because the licensee failed to declare the valve inoperable prior to taking actions to address the conditions of the valve. The licensee initiated LER 93-004-01 and LER 93-004-02 in response to the violations.

The licensee determined the root cause of the failure of Valve CS-125A to open to be a system design flaw which did not allow air to be vented from the piping, thereby, causing a high differential pressure following a pump start. The licensee's response to the violations dated January 6, 1994, and LER 93-004 included the following corrective action items:

Emergency Technical Specification Change: On October 1, 1993, the licensee was granted an emergency technical specification change which allowed Valve CS-125A and/or B to be left in the open position until startup (prior to Mode 4) following Refueling Outage 6. The change was needed to prevent failure of Valve CS-125A or Valve CS-125B to open with excessive differential pressure across the valve. Following Refueling Outage 6, the inspectors noted that Valve CS-125A and Valve CS-125B were maintained in the closed position.

Establishment of Condition Review Board: On November 3, 1993, the licensee established a condition review board to review condition reports and condition identifications to ensure proper priority and dedication of resources. Site Directive W2.501, "Corrective Action," was revised on March 31, 1994. The revision specifies the condition review board members, changed definitions, revised the condition report form, and transferred 10 CFR Part 21 and 10 CFR 50.73 reviews to the nuclear safety director.

Precursor Trending Program: The precursor trending program was upgraded to review input cards daily, thereby ensuring that attention was given to adverse conditions. Administrative Procedure UNT-006-023, "Precursor Trending Program," was issued on March 26, 1994. The procedure requires the shift technical advisor department to review precursor trending program cards within one working day.

Revisions to Plant Procedures: The inspectors noted that the following plant procedures were revised to improve identification and processing of identified deficiencies:

Site Directive W2.501, "Corrective Action"
Site Directive W4.101, "Operability/Qualification Confirmation Process
UNT-005-002, "Condition Identification"
UNT-006-011, "Condition Report"
UNT-006-016, "Root Cause Investigation and Analysis"
UNT-006-023, "Precursor Trending Program"

Departmental Training Sessions: Based on a review of training attendance records and the "Corrective Action Program Training Package," training was

provided to personnel by department to accomplish the following goals: emphasize corrective action program goals, define individual responsibilities, clarify entry requirements for the corrective action process, and discuss management expectations.

Evaluation of Procedures and Design to Minimize Pressure Surges: The licensee's investigation indicated that the air in the containment spray system was a result of inadequate system design in that vent valves had not been installed in locations where air could accumulate. The licensee implemented a design change to aid in preventing a high differential across the valve by installing a time delay in the actuation circuitry which ensures that Valve CS-125A and Valve CS-125B start to open prior to their respective containment spray pump starting. The modification also installed additional venting capacity on the Valve CS-125B valve actuator to reduce the stroke time (this modification had previously been performed on Valve CS-125A).

Valve CS-125A and Valve CS-125B Inspection and Repair: Valve CS-125A and Valve CS-125B were inspected and repaired under Work Authorizations 01113728 and 0111913 respectively. New seats, gates, o-rings, and shorter stems were installed on both valves. Additionally, 18-month repetitive task assignments were made to prevent and/or detect potential failures.

Evaluation of Additional Systems for Similar Problem: The licensee performed a review to determine if other safety-related systems could be effected by similar circumstances. The licensee's evaluation stated that 26 of 31 safety-related systems were classified as nonsusceptible and that the emergency feedwater, safety injection, chemical volume and control, and auxiliary component cooling water systems were potentially susceptible and required further evaluation. The evaluation concluded that the susceptibility of these systems to air-induced water hammer events was low and that an adequate means of detectability existed through operating and surveillance procedures and/or pressure instrumentation and relief capability. The evaluation team determined that the containment spray event was unique and that a generic problem did not exist in the plant's design basis. The inspectors concluded that these corrective actions were acceptable.

8.3 (Closed) Inspection Followup Item 382/9408-02: Review of Engineering Evaluation for Storage of Lifting Slings on Top of Pressurizer Cubicle

During the last refueling outage the inspectors noted lifting slings stored on top of the pressurizer cubicle while touring the containment building and questioned if an engineering evaluation had been performed. The licensee initiated Condition Report 94-378 because an engineering evaluation had not been performed for the potential of the lifting slings to adversely impact equipment if the plant was subjected to seismic event. This item was opened pending a review of the subsequent engineering evaluation.

During this inspection period the inspectors reviewed the licensee's corrective actions to address Condition Report 94-378. The licensee performed a walkdown to determine if similar conditions existed. The licensee

building without an engineering evaluation. An engineering evaluation was performed prior to the end of Refueling Outage 6 which approved the storage of the lifting slings and reactor cavity stairs in a specified security position and location. Based on the inspectors review of the condition report and engineering evaluation this item is closed.

## 9 ONSITE REVIEW OF LICENSEE EVENT REPORTS (92700)

### 9.1 (Closed) Licensee Event Reports (LER) 93-004-01 and 93-004-02: Containment Isolation Valve CS-125A Failure to Stroke Open

These LERs were initiated by the licensee in response to Violations 382/9333-02 and 382/9333-03 and were reviewed by the inspectors in their closure.

ATTACHMENT 1

## 1 PERSONS CONTACTED

### 1.1 Licensee Personnel

R. E. Allen, Security and General Support Manager
R. G. Azzarello, Director, Design Engineering
R. P. Barkhurst, Vice-President, Operations
R. F. Burski, Director, Nuclear Safety
M. Ferri, Director, Plant Modification and Construction
J. G. Hoffpauir, Maintenance Superintendent
A. Holder, Senior Engineer, Fire Protection
J. B. Houghtaling, Technical Services Manager
A. S. Lockhart, Quality Assurance Manager
D. C. Matheny, Operations Superintendent
J. M. O'Hearn, Manager, Training
D. F. Packer, General Manager, Plant Operations
W. H. Pendergras, Shift Supervisor, Licensing
D. L. Shipman, Planning and Scheduling Manager
R. S. Starkey, Manager, Operations and Maintenance
D. W. Vinci, Licensing Manager

The personnel listed above attended the exit meeting. In addition to these, the inspectors contacted other personnel during this inspection period.

## 2 EXIT MEETING

An exit meeting was conducted on October 5, 1994. During this meeting, the inspectors reviewed the scope and findings of the report. The licensee did not express a position on the inspection findings documented in this report. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.