APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Reports: 50-498/88-11 Operating License: NPF-71
50-499/88-11

Dockets: 50-498
50-499

Licensee: Houston Lighting & Power Company (HL&P)
P. O. Box 1700
Houston, Texas 77001

Facility Name: South Texas Project, Units 1 & 2 (STP)

Inspection At: STP, Matagorda County, Texas

Inspection Conducted: February 11 through March 31, 1988

Inspectors: _____ 4/13/88
W. F. Smith, Senior Resident Inspector, Project Date
Section A, Division of Reactor Projects

_____ 4/27/88
for E. A. Plettner, Resident Inspector, Project Date
Section C, Division of Reactor Projects

_____ 4/27/88
for P. W. Michaud, Resident Inspector, Project Date
Section B, Division of Reactor Projects

_____ 4/27/88
for W. B. Jones, Resident Inspector, Project Date
Section C, Division of Reactor Projects

_____ 4/27/88
for T. Reis, Resident Inspector, Project Date
Section B, Division of Reactor Projects

Approved: _____ 4/27/88
G. L. Constable, Chief, Project Date
Section D, Division of Reactor Projects

Inspection Summary

Inspection Conducted February 11 through March 31, 1988 (Report 50-498/88-11)

Areas Inspected: Routine, unannounced inspection of onsite followup of events, monthly maintenance observation, licensee action on previous inspection findings, monthly surveillance observation, engineered safety feature system walkdown, operational safety verification, and startup testing observations.

Results: Within the areas inspected, three apparent violations were identified. The first violation involved the licensee's failure to be aware of system status; thus operating the plant in a condition prohibited by technical specifications (paragraph 2.a). The second violation involved continued failure on the part of reactor operators to recognize the proper conditions for entering and exiting technical specification action statements (paragraph 2.d). The third violation addressed failure on the part of the licensee to have appropriate administrative controls over the temporary lifting of electrical leads and installation of jumpers (paragraph 2.c).

Inspection Conducted February 11 through March 31, 1988 (Report 50-499/88-11)

Areas Inspected: No inspection of Unit 2 was conducted.

Results: Not applicable.

DETAILS

1. Persons Contacted

HL&P

*W. H. Kinsey, Plant Manager
*M. R. Wisenburg, Unit 1, Plant Superintendent
*M. A. Ludwig, Manager, Maintenance Department
*H. S. Blinka, Performance Support Supervisor
J. W. Loesch, Manager, Plant Operations Department
*E. Nichols, Jr., Electrical Maintenance Division Manager
H. H. Johnson, Division Manager, Unit 1 Operations
*W. S. Blair, Maintenance Support Division Manager
J. J. Nesrsta, Jr., Division Manager, Systems
*C. M. Turner, Support Engineering, Fire Protection
*D. A. Leazar, Reactor Support Manager
*S. M. Head, Supervisory Licensing Engineer
S. M. Travis, Technical Support
*J. Labuda, Technical Support

NRC

*J. E. Bess, Resident Inspector, Operations
*A. Singh, Reactor Inspector, Region IV

In addition to the above personnel, the NRC inspectors held discussions with various operations, engineering, technical support, maintenance, and administrative members of the licensee's staff.

*Denotes attendance at the exit interview.

2. Onsite Followup of Events (93702)

The NRC inspectors observed and reviewed licensee actions on selected operational events and potential problems that occurred during the period of this inspection.

a. Isolated Feedwater Flow Transmitters

On February 9, 1988, while the plant was in Operational Mode 3 and during a performance of precritical calibration checks of feedwater and steam flow instrumentation, the licensee discovered seven out of twelve feedwater flow transmitters (FWFT) isolated and out of service. Since the technical specifications prohibit this condition in Mode 3, a cooldown was initiated in accordance with Technical Specification (TS) 3.0.3. Prior to the end of 1 hour, the cooldown was terminated when the instruments were placed back in service.

The licensee reported this event to the NRC and immediately began an investigation to determine why these FWFT were isolated. In addition, the licensee performed a walkdown of each instrument listed in TS Tables 3.3-1 and 3.3-3 to verify that the associated instrument transmitters were not isolated. This verification was completed the same evening, and no other safety-related instrumentation was found isolated from its respective system.

During the investigation, the licensee discovered that the first calibration of these seven FWFT was performed between April 22 and 28, 1987. The FWFT were left in service following these calibrations. At that time, however, the feedwater system had not been turned over to plant operations from the startup group. On April 30, 1987, the startup group performed hydrostatic tests on portions of the feedwater system following maintenance. All 12 FWFT were valved out of service to perform this hydrostatic test. The startup group apparently did not return these instruments to service following the completion of the test. The other five FWFT which were found in service on February 9, 1988, had their initial calibration surveillance tests performed after the completion of the hydrostatic tests on April 30, 1987. These five FWFT were properly left in their operable, unisolated condition following the calibrations.

The NRC considers this matter potentially significant not only because operating the plant in a condition prohibited by TSs is an apparent violation of NRC regulations (498/8811-01), but also because of its relevance to the Unit 2 system turnover and startup programs. Although, it was important to promptly verify that there are no other safety-related systems and attendant instrumentation in a similar isolated status, particular emphasis must be placed on correcting any deficiencies in the system turnover program and plant startup procedures for both Units 1 and 2 to preclude a repeat occurrence.

The licensee reported this event in Licensee Event Report (LER) 88-016, dated March 10, 1988.

b. Inadequate Inservice Test Result Review

On February 11, 1988, during the performance of essential cooling water screen wash booster pump 1A inservice test in accordance with Procedure 1PSP03-EW-0003-1, a value of 49.3 psid was obtained for pump differential pressure. The test data sheet attached to the procedure required action if the pump differential pressure was above 48.9 psid. The licensee's test coordinator and shift supervisor failed to note this out of tolerance value during their post test review and erroneously called the test results acceptable. The licensee discovered the out of tolerance value during a management review of completed surveillance tests on February 15, 1988. The pump was promptly declared inoperable, and the NRC was informed.

When the measured value of pump differential pressure is found higher than expected, the action required is to perform a Reference Values Measurement surveillance test. This test was performed on February 16, 1988, with satisfactory results, thus indicating no problem existed with the pump.

The licensee reported this event in LER 88-020, dated March 15, 1988. The report adequately described the event as to root cause, corrective action, and safety significance. Therefore, pursuant to 10 CFR 2, Appendix C, Section V.A., a Notice of Violation will not be issued for this matter.

c. Containment Personnel Airlock Design Deficiency

While reviewing documentation of a test of the containment personnel airlock on February 11, 1988, the licensee's electrical engineers discovered four solenoid operated valves in air lines to the inflatable door seals which appeared to meet criteria for containment isolation valves, but were not classified as such. The valves were purchased under Category 2 requirements and containment isolation circuitry was not included in the electrical design. Two of the valves were normally open and supplied air to receivers which then supplied air to each door seal. The other two valves were normally closed and provided air to test the volume between the double seals on each door. When discovered, the licensee immediately isolated, de-energized, and tagged the power supplies to these four valves as required by TS 3.6.3 and then informed the NRC.

A conference call was held between the licensee and the NRC on February 12, 1988, to determine whether these valves met the criteria to be classified as containment isolation valves. It was determined that the valves were within the purview of General Design Criterion 57 of 10 CFR Part 50, Appendix A and should be considered containment isolation valves. At the time of the conference call, the plant was in Mode 3 and cooldown to Mode 5 was planned for other reasons within 2 days.

Short-term corrective actions were agreed upon between the licensee and NRC. The corrective actions included maintaining the four valves deenergized and tagged and stationing a person at the power supply breaker should the valves require opening to repressurize the accumulators during the interim period until the plant was cooled down to Mode 5. The licensee provided these four valves with a containment isolation phase A signal, which was completed as agreed prior to exceeding 5 percent of full power.

On February 18, 1988, the licensee requested and was granted enforcement discretion from the Region IV Regional Administrator, waiving the requirements of TS 3.0.4 for the above valve configuration in order to change operational modes and heat up the plant using the main coolant pumps prior to completion of the

modifications to the valve circuitry. This event was reported in LER 88-017, dated March 11, 1988, and the report adequately described the circumstances, root cause, and corrective actions.

d. Failure to Comply with Technical Specifications Related to Essential Chiller Operability

On February 12, 1988, at 10:00 p.m., the 12A Essential Chilled Water Cooling Unit tripped and could not be restarted. The 11A Chiller was operational. The A loop of the Essential Chilled Water System was not considered fully operational unless both chillers were available, even though the 11A Chiller would have had sufficient capacity with the ambient temperatures existing at the time.

TS 3.7.14 requires three independent Essential Chilled Water System loops to be operable in Modes 1, 2, 3, and 4. The plant was in Mode 3 at the time, and the associated TS action statement allows 72 hours to restore one inoperable loop. However, the C Train of Essential Chilled Water was also out of service along with the C Train Emergency Core Cooling System (ECCS) pumps for scheduled maintenance. Since TS 3.7.14 does not address two inoperable loops, the licensee entered TS 3.0.3 and began a cooldown of the plant at 10:50 p.m. on February 12, 1988. Parallel efforts to return either the A or C Train chillers to operation were also initiated by the licensee.

At 4:17 a.m. on February 13, 1988, the C Train chillers were returned to operational status (but not the C Train Low Head Safety Injection Pump). The licensee then met the requirements of the action statement of TS 3.7.14 by having only the A loop inoperable and exited TS 3.0.3. A heatup was begun to return the plant to Mode 3.

Although the action statement of TS 3.7.14 was satisfied and thus TS 3.0.3 was no longer applicable for the Essential Chilled Water System, the licensee failed to recognize that A Train ECCS equipment could not be considered operable under TS 3.5.2 since its associated auxiliary equipment, the A Train Essential Chilled Water System, was inoperable. The action statement of TS 3.5.2 allows up to 72 hours to restore one inoperable subsystem but does not address two inoperable subsystems. With both the A and C Trains of ECCS inoperable, the provisions of TS 3.0.3 were applicable due to the inability to meet the action statement requirements of TS 3.5.2. Therefore, TS 3.0.3 should not have been exited and a cooldown to Mode 5 continued until the action statements of both TS 3.7.14 and 3.5.2 were met. This could only have occurred if either:

(1) The A Loop of the Essential Chilled Water System was returned to operable status, or

(2) The C Train ECCS subsystem equipment was returned to operable status.

The licensee recognized this noncompliance with the TS when the off-going Unit Supervisor called from home to question the status of compliance with TS 3.5.2 under the given system configuration.

A cooldown to Mode 5 was begun at 12:07 p.m. on February 13, 1988, to place the plant in a condition of compliance with the TS. Mode 5 was reached at 1:17 a.m. on February 14, 1988, which was within the time requirement of TS 3.0.3 based on the original entry into TS 3.0.3 at 10 p.m. on February 12, 1988. The safety significance of this situation was minimal since there was Train A Essential Chilled Water available, although not 100 percent, such that Train A ECCS components would likely have been able to perform their design functions if required by plant conditions.

The NRC considers the licensee's failure to identify applicable TS Limiting Conditions for Operation and failure to recognize proper conditions for entering and exiting TS action statements potentially significant. In addition, the NRC is concerned because a similar violation was identified in NRC Inspection Report 50-498/88-09 in its Notice of Violation 498/8809-05. It is recognized that these incidents occurred within one week, and previous corrective actions may not have taken full effect. Notwithstanding, the failure to adhere to TS limiting conditions for operations is significant.

The licensee reported this event in LER 83-019, dated March 14, 1988.

e. Inadvertent Safety Injection (SI) Actuation

A SI actuation occurred at 5:04 p.m. on February 12, 1988, when the plant was in Mode 3 at normal operating pressure and temperature, and a reactor coolant system flow coastdown test was in progress. As part of this test, all reactor coolant pumps (RCPs) were tripped at 4:45 p.m. When the first RCP (in loop D) was restarted at 5:04 p.m., a safety injection actuation occurred on a LO-LO T cold signal. All systems and components functioned as required. No boric acid solution was injected into the reactor coolant system because reactor coolant system operating pressure was maintained.

The setpoint of the LO-LO T cold safety injection trip is 532°F. The lowest recorded value of T cold was 557°F. The associated circuitry, however, contains a rate circuit which, for every instantaneous change of 3°F, provides a 4:1 gain signal such that a 12°F net change is processed. With the given values of approximately a 9° actual temperature decrease and the instrumentation perceiving a rapid change when the RCP was started, the LO-LO T cold SI circuitry signaled a 36°F decrease which was sufficient to reach the actuation setpoint.

The licensee performed an evaluation, with assistance from Westinghouse, of the requirements for having this rate circuit, the requirements for the gain provided by this circuitry to be at its

present value, and any implications this circuitry may have on further testing and operation. The NRC inspectors will monitor the licensee's evaluation and any associated activities in response to this event. Pending completion of this evaluation for review and followup by the NRC inspectors, this matter will be considered an Open Item (498/8811-03).

3. Monthly Maintenance Observation (62703)

The station maintenance activities listed below were observed and documentation was reviewed to ascertain that the activities were conducted in accordance with approved procedures and the TSs as applicable.

a. On March 19, 1988, the licensee commenced work to place bonnet seal caps on three coolant charging check valves in the chemical and volume control system (CVCS) which had excessive leakage. The NRC inspector observed the installation and welding of the bonnet seal caps on these three valves. Several Maintenance Work Requests (MWRs) were issued which contained radiation work permits (RWP), material controls requirements, quality control requirements, and post maintenance testing requirements. The individuals performing the task were cognizant of their duties and performed them in a professional manner. A foreman was present during the entire work process. The shop supervisor was also present during part of the work. No problems were identified.

b. On February 23, 1988, MWR MS-55170 was initiated to repair a hydraulic fluid leak on the "B" main steam line power operated relief valve (PORV). The unit supervisor reviewed the MWR and authorized the work prior to the MWR being started. The appropriate TS limiting condition for operation (LCO) was entered to prevent entry into Operational Mode 2 and to establish the time the unit may remain in Mode 3 with the PORV inoperable. Instructions provided to maintenance personnel in the MWR appeared to be adequate for the circumstances. An adequate equipment clearance was obtained and the equipment positions were verified correct prior to initiating work on the PORV. During performance of the MWR, the licensee discovered that the controller had to be replaced and a replacement was obtained from Unit 2. The appropriate documentation was provided to allow installation of the controller in Unit 1. The PORV was returned to service on March 1, 1988, following removal of the equipment clearance and satisfactory post maintenance testing.

c. On February 29, 1988, MWR AF-52382 was initiated to allow removal of the steam driven auxiliary feedwater pump thrust bearing. During a surveillance test of this pump during the previous day, the licensee had noted that the thrust bearing was operating at an elevated temperature. The pump was declared inoperable at 9:44 p.m. on February 28, 1988, and the appropriate TS LCO was entered. Clearances were obtained prior to initiating the work and the work was performed under the direction of a qualified individual. As the

scope of the work increased during the performance of the MWR, the MWR was revised to provide further instructions. On March 2, 1988, the plant was cooled down to Mode 4 when it became apparent that the auxiliary feedwater pump could not be repaired and returned to service within the time permitted by the TSs. The entire pump was later replaced when an inspection revealed that the throttle bushing failure resulted in extensive damage to the pump shaft and casing. On March 5, 1988, the pump replacement was completed and the equipment clearances removed. The replacement pump was declared operable following successful postmaintenance testing.

During review of the documentation packages for the above MWRs, MS-55170 and AF-52382, it was noted that the maintenance personnel who had attended the premaintenance briefing were not identified in the appropriate packages. The NRC inspector held discussions with licensee management to ascertain how they ensure that individuals performing maintenance understand the work they are to perform. This could be of particular concern when the work extends beyond the first maintenance crew's shift. The possibility of requiring each individual to read the MWR and sign a statement that he has read and understands the work he is to perform, was identified as an improvement item. The licensee agreed to take the item under advisement to determine if additional controls would be beneficial.

d. The controls for lifting leads and installing temporary jumpers during maintenance activities was also reviewed. It was noted that the licensee provided lead lift/reinstall and jumper installation/removal records as attachments to MWR packages when the work required lifting leads or the use of jumpers. However, this attachment was not controlled or referenced in maintenance control Procedure OPGP03-ZM-0003, Revision 15, "Maintenance Work Request Program," nor was it identified, or its use described, in any other approved procedure. At the time of this review, Procedure OPMP07-ZI-0001, "I&C Troubleshooting Permanent Plant Equipment," was being drafted. At the end of this inspection period, the licensee presented the approved procedure to the NRC inspector. Upon reviewing the document, the inspector noted that the lifted lead log does not identify the terminal block or termination point where a lifted lead must be reinstalled. This was identified to the licensee. Failure to have established and implemented an administrative procedure to control lifted leads and temporary jumpers during maintenance activities since the plant was licensed is an apparent violation of TS 6.8.1.a (498/8811-04).

The guidelines for fuse removal/replacement and temporary jumper removal provided for electrical maintenance personnel in Procedure OPMP05-ZE-0400, "Electrical Maintenance Performance Guidelines," were also reviewed. The NRC inspector expressed concern that the brevity of descriptions for fuse removal and jumper installation as required by the Fuse Removal and Reinstallation - Temporary Jumper Installations and Removal Form, OPMP-ZE-0400-2, may cause incorrect reinstallation of fuses and removal of jumpers.

Therefore, as a result of this inspection, the NRC is concerned about the adequacy of the entire program for lifted leads, fuse removal, and temporary jumpers, and the licensee's corrective actions should address its entire program.

e. The NRC inspectors reviewed the following additional maintenance activities during this inspection period.

(1) MWR WL-57543, "LWFS RCDT 1A LCV-leakage"

(2) MWR CS-87028162, "Containment Spray Pump Discharge Valve - Motor Drawing High Current"

(3) MWR MS-55437, "Main Steam Drain Isolation Valve Inoperable"

In addition, one NRC inspector reviewed Plant Procedures OPGP03-ZM-0003, "Maintenance Work Request Program," OPGP03-ZE-0020, "Post Maintenance Testing Program," and OPGP02-ZA-0080, "Work Coordination Program." Each program was found to fully satisfy the requirements set forth in Regulatory Guide 1.33, Section 9.

While the maintenance, post maintenance testing, work coordination programs, and individual MWRs appeared to be fully satisfactory, the NRC inspector observed what appeared to be a weakness in the control of work presented to control room personnel. Procedure OPGP03-ZA-0080 states, in part, that work/testing shall be restricted to a single safety train at any one time unless preapproved by operations and/or station management.

While observing control room activities at approximately 8:30 p.m. on March 12, 1988, the NRC inspector noted the oncoming unit supervisor reviewing the MWR packages sent up from the Work Control Center (WCC) for work start approval. The unit supervisor was heard commenting to the shift supervisor that the WCC had sent up requests which, if authorized, would have taken out three trains of auxiliary feedwater. The work requests were denied and returned to the WCC.

After witnessing this incident, the NRC inspector interviewed several unit and shift supervisors in relation to this concern. There is a concern that the lack of operational expertise in the WCC could cause problems. During other tours of the Control Room and Auxiliary Building, the NRC inspectors noted a large number of MWR items still pending on local instrumentation and on Control Room Panels. A safety problem did not appear to exist since these parameters could be obtained from a computer readout. However, a long time delay could occur depending on the computer load at the time of the request. Many of these MWRs have been long standing. Interviews were conducted to determine the reason for the long delay in correcting the problems. Several factors existed with the most prevalent one concerning the WCC. The WCC had a lack of experienced operations personnel to provide input in helping to assign the correct priority to the work items. The licensee was aware of the problem and

took actions to correct the problem; however, the experience level of the personnel will improve with time as the licensee gains experience in this area.

No other violations or deviations were identified.

4. Licensee Action on Previous Inspection Findings (92701)

(Closed) Unresolved Item 498/8809-02: Licensee's program for leakage control of potentially contaminated systems inside and outside the reactor containment. The NRC inspectors conducted several tours of the reactor containment building, mechanical and electrical auxiliary building, and the fuel handling building. During these tours, the inspectors noted leaks from borated systems which include containment spray, low head safety injection, high head safety injection, and residual heat removal. Most of these leaks were identifiable by the build-up of boric acid crystals; however, several leaks were observed by the presence of water on the floor. The issue was whether or not the licensee was complying with TS 6.8.3, which requires the licensee to establish, implement, and maintain a program to reduce leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to as low as practical levels. The licensee had responded that the leaks were being identified and tracked, but the personnel resource and schedule constraints did not permit achievement of leak-free systems prior to initial criticality.

During this inspection period, the NRC inspector conducted a detailed review of the leakage control program as implemented by Procedures OPGP03-ZE-0028, "Contaminated System Leakage Test Program," and OPGP03-ZO-0004, "Plant Conduct of Operations," paragraph 4.3.7.3, and determined that although the licensee was in compliance with these procedures and therefore in compliance with TS 6.8.3, the number of leaks that existed after startup should be identified and corrected. On February 20, 1988, for example, the NRC inspector noted water leakage of 2-3 drops per second from the CS B pump discharge flange. This leak was evident by standing water beneath the pump, plus constant water dropping from the pump upper shaft seal drain line and down to the pump suction flange. This leak went undetected until March 14, 1988, when the NRC inspector finally directed the attention of a reactor plant operator to the leak.

The licensee's conduct of Operations Procedure OPGP03-ZO-0004, paragraph 4.3.7.3, requires that during the operator's rounds, special attention shall be paid to systems containing boric acid in solution, and that such leaks are to be reported and promptly repaired. The inspectors pointed out to licensee management that unless the operators are trained to be more observant on their tours, leaks on contaminated systems will not be identified for repair and employees in the vicinity of the leaks are subject to becoming contaminated. The licensee presented a computer data run to the inspector showing that notwithstanding the lack of attention to detail demonstrated by some watchstanders in this area, an

aggressive leak identification and repair program appears to be in place, and there is management attention applied. The resident inspectors will continue to monitor leakage control activities as part of their routine safety verification inspections. This item is closed.

(Open) Unresolved Item 498/8809-01: Fire Watch program deficiencies. During this inspection period, the NRC inspectors reviewed the fire watch logs during their tour of the mechanical and electrical buildings, fuel handling building, and isolation valve compound. These tours were conducted at random and were performed during all three shifts. In each case, the times logged on the fire watch logs were appropriate. Fire watch personnel were also observed during the performance of their rounds, and their actions appeared satisfactory. This item will remain unresolved pending further review by the staff of the deficiencies identified in NRC Inspection Report 50-498/88-09.

No violations or deviations were identified.

5. Monthly Surveillance Observation (61726)

During this inspection period, the NRC inspectors observed portions of the performance of Plant Surveillance Procedure 1PSP03-SI-0023, Revision 2, "SIS Pressure Isolation Check Valve Leak Test." The test was completed on February 21, 1988, to verify operability of reactor coolant system boundary check valves in the Safety Injection Systems.

Valve RH-0020A was found to have a leakage rate greater than allowed by the acceptance criterion. The licensee suspected that a test valve, and not the boundary valve, was leaking as evidenced by flow noises in the test valve. The test was halted, and the procedure was changed to provide for freeze seals on the small test piping to facilitate determination of boundary valve leakage only. A freeze seal was then applied to a test line downstream of Valve RH-0020A which reduced the measured leakage to that of Valve RH-0020A only, and the acceptance criterion was met.

The NRC inspector noted that the freeze seal was controlled by a MWR. The use of the clearance program along with the MWR for controlling the application and removal of freeze seals was discussed with licensee personnel. Because the application of a freeze seal is the equivalent of closing a "block valve," the use of the clearance program provided a well established mechanism for ensuring the freeze seal was applied and removed with an independent verification. The applicable procedures were reviewed for adequacy, test instrumentation was verified to be in calibration, and test data was reviewed for accuracy and completeness. The performance of licensee personnel involved with this surveillance was satisfactory and the NRC inspectors observed that the personnel demonstrated adequate job knowledge and worked in a professional manner.

No violations or deviations were identified.

6. Engineered Safety Feature (ESF) System Walkdown (71710)

The NRC inspector conducted a walkdown of the accessible portions of the containment spray system to independently verify the operability of the system. A review was performed to confirm that the licensee's system operating procedure matched plant drawings and the as-built configuration. Equipment condition, valve and breaker position, housekeeping, labeling, permanent instrument indication, and apparent operability of support systems essential to actuation of the ESF system were all noted as appropriate. The NRC inspector found no significant problems that would preclude the system from performing its intended safety functions.

The NRC inspector found several pipe flange and valve packing leaks, some of which were not identified by MWR tags. The licensee's failure to identify and repair systems which can become contaminated or are susceptible to boron induced corrosion was discussed in paragraph 4 of this report.

No violations or deviations were identified.

7. Operations Safety Verification (71707 & 71715)

The NRC inspectors observed operational activities throughout the inspection period and closely monitored operational events. Control room activities and conduct were generally observed to be well controlled. Proper control room staffing was maintained and access to the control room operational areas was controlled to minimize distractions. Selected shift turnover meetings were observed, and it was found that information concerning plant status was being covered in each of these meetings.

It was noted during the first 2 weeks of this inspection period that when reactor operators became involved in plant evolutions there was a tendency to silence annunciator alarms without immediately investigating the reason for the alarm. Annunciators that could be cleared were also noted to stay on for an extended period of time. This was discussed with licensee personnel, and an obvious improvement in the reactor operators' attention to alarms was observed during the latter part of the inspection period.

Periodic reviews of the control room operator log were performed to determine if the log was being maintained in accordance with Procedure OPOP01-ZQ-0030, "Maintenance of Plant Operations Logbooks." It was noted on several occasions that the logs were incomplete, including failure to identify when limiting conditions for operations were exited. A violation regarding maintenance of the control room operator log was identified in NRC Inspection Report 50-498/88-17. The licensee revised Procedure 1POP01-ZQ-0030 to improve the method by which the control room log is maintained, and the revised procedure was implemented on March 8, 1988.

Plant tours were conducted, and overall plant cleanliness was good. Areas which were previously identified as having been inadequately lighted have been corrected.

General radiation protection practices were observed for individuals in the radiation control area (RCA). Personnel were observed to properly log onto the appropriate radiation work permit and upon exiting the RCA, the radiation monitors were properly utilized to check for contamination.

Security activities were observed by the NRC inspectors while entering and exiting the protected area and during tours inside the vital islands. Security personnel were noted to provide instruction to station personnel who were not following good practices for passing through key card doors. Compensatory posts were established for areas where vital area barriers were defeated.

During one tour of the RCB, the NRC inspector noted that all the fire hoses located inside the RCB were due for hydrostatic testing in July 1988. The current plant operating schedule is to be at power during the time frame when the required test should be performed. The NRC inspector identified this as a concern to the licensee. The licensee was unaware of the pending problem with the fire hoses in the RCB. However, when brought to their attention, they replaced fire hoses in the RCB and other areas inaccessible during power operations with fire hoses having test dates which will expire during subsequent scheduled outages. In addition, the identified fire hoses will be added to an existing tracking system to ensure that testing will be completed during scheduled planned outages.

On February 11, 1988, the NRC inspectors observed portions of an emergency drill conducted by the licensee. Control room personnel were observed to be conducting activities in accordance with procedures and took a generally conservative approach to the problems presented in the drill scenario. Technical Support Center activities were underway in the engineering and health physics areas as soon as personnel arrived. The NRC did not participate in the drill; however, the NRC inspectors identified minor areas where improvements could be made. No deficiencies were noted.

The NRC inspector reviewed the licensee's total corrective maintenance history for the previous 3 months with licensee management personnel. A sharp increase in the total number of open MWRs has occurred from the middle of January 1988 to the first week of March 1988. An increase from approximately 1200 open MWRs to 1550 was noted during this time period. The largest increase has been with instrumentation and control items followed closely by mechanical items. This large increase in open MWRs has resulted mostly in degradation of individual components. Considerable

licensee management involvement is needed in this area to ensure that individually degraded equipment does not result in degraded capabilities of any safety systems.

No violations or deviations were identified.

8. Startup Test Witnessing and Observation (72302)

The objectives of this inspection were to ascertain conformance of the licensee to the Unit 1 operating license and procedural requirements, and to observe operating staff performance. The NRC inspectors witnessed parts of the following tests on a sampling basis.

On February 26, 1988, the licensee initiated Plant Engineering Procedure 1PEP04-ZX-0001, "Test Sequence for Initial Criticality and Low Power Testing." The NRC inspectors noted that the prerequisites had been met, and the procedure was being performed in a controlled manner. On February 27, 1988, the inspector observed the test briefings for Procedure 1PEP04-ZX-0002, "Initial Criticality." This procedure was used to control the addition of reactivity through control rod withdrawal and reactor coolant system (RCS) boron dilution, and the briefings were held in a professional manner.

On February 27, 1988, at 2:24 a.m., the startup banks were withdrawn for the initial approach to criticality. Withdrawal of the startup banks was well controlled and an inverse count rate determined at each 50-step interval to monitor approach to criticality. At 9:52 a.m., the first control banks were withdrawn. Dilution to criticality was initiated at 1:06 p.m. with Control Bank D at 170 steps. The NRC inspectors observed that all pressurizer heaters were energized to maximize pressurizer spray and boron mixing. Chemistry samples of the RCS were taken every 15 minutes and pressurizer samples every 30 minutes to determine RCS boron concentration. On January 28, 1988, at about 5:45 a.m. with the reactor subcritical, an ESF actuation was inadvertently received during the performance of a surveillance test. The reactor tripped because of the safety injection signal. Control room personnel responded to the reactor trip in a controlled and deliberate manner. The emergency procedures were immediately retrieved and systematically utilized. The reactor was determined to be in a safe condition before the safety injection signal was reset. At 5:50 a.m., the shift supervisor declared a Notice of Unusual Event (NOUE) because it was not immediately obvious that an uncomplicated reactor trip had occurred. The NOUE was cancelled at 6:30 a.m. The licensee had placed Channel I of LO-LO T cold for RCS loop C in a tripped condition for the performance of Surveillance Test 1PSP02-RC-0453. A spurious trip on Channel III completed the 2 out of 3 logic needed to initiate the ESF actuation on LO-LO T cold.

The licensee was not able to duplicate the conditions that caused the spurious trip of LO-LO T cold on Channel III. The rate circuit cards were removed and placed on a "shake table" to induce a trip. No trip was

experienced. The rate circuit cards were replaced, and no further spurious trips have occurred. The licensee reported the above incident in LER 88-022, dated March 24, 1988.

Initial criticality in accordance with Procedure 1PEP04-ZX-0002 was again initiated on March 7, 1988, at approximately 10:00 p.m. following repair of the auxiliary feed water pump 14. Initial criticality was achieved at 5:08 a.m. on March 8, 1988. Criticality was observed to occur within the 50 ppm tolerance band established for boron concentration in the RCS with control bank D at 170 steps. Reactor power was stabilized for low power physics testing. Access to the control room was strictly controlled, and no unnecessary personnel were allowed within the control area.

The following startup tests were witnessed in part:

Procedure	Title
1PEP02-ZX-0001	Test Sequence for Initial Criticality
1PEP04-ZX-0001	Rod Worth Determination
1PEP04-ZX-0006	N-1 Rod Worth (Shutdown Margin) Verification
1PEP04-ZX-0007	Pseudo Ejected Rod Test
1PEP04-ZX-0010	Natural Circulation Verification
1PEP04-ZX-0003	Boron Endpoint Measurement

The NRC inspector noted that the tests were properly executed under the direction of a qualified Shift Technical Advisor (STA) designated as Test Director with a Reactor Engineer present. It was observed that control room personnel were briefed on the tests. Procedures used in testing were followed verbatim and properly field changed when required. The overall performance of control room personnel (test directors, engineers, and operators) was perceived as disciplined, methodic, and coordinated during these tests.

No violations or deviations were identified.

9. Exit Interview

The lead NRC inspector met with licensee representatives denoted in paragraph 1 on March 31, 1988, and summarized the scope and findings of the inspection. Other meetings between NRC inspectors and licensee management were held during the inspection time period to discuss identified concerns. The licensee did not identify as proprietary any of the information provided to or reviewed by the inspectors during this inspection.