

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

NRC Inspection Report: 50-498/88-18      Operating License: NFF-71 (NPF-76)  
50-499/88-18      Construction Permit (CP): CPPR-129

Dockets: 50-498      CP Expiration Date: December 1989  
50-499

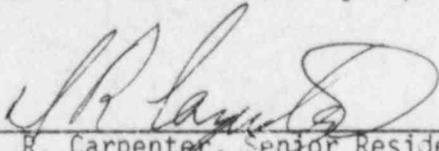
Licensee: Houston Lighting & Power Company (HL&P)  
P.O. Box 1700  
Houston, Texas 77001

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

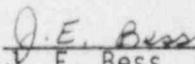
Inspection At: STP, Matagorda County, Texas

Inspection Conducted: March 1 through April 4, 1988

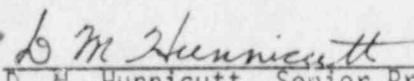
Inspectors:

  
\_\_\_\_\_  
D. R. Carpenter, Senior Resident Inspector  
Project Section D, Division of Reactor Projects

5-10-88  
Date

  
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J. E. Bess, Resident Inspector, Project Section D  
Division of Reactor Projects

5/10/88  
Date

  
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D. M. Hunnicutt, Senior Project Engineer  
Project Section D, Division of Reactor Projects

5/10/88  
Date

Accompanying

Personnel: T. O. McKernon, Reactor Inspector, Division of  
Reactor Projects

Approved:

  
\_\_\_\_\_  
G. L. Constable, Chief, Project Section D  
Division of Reactor Projects

5/10/88  
Date

Inspection Summary

Inspection Conducted March 1 through April 4, 1988 (Report 50-498/88-18;  
50-499/88-18)

Areas Inspected: Routine, unannounced inspection including licensee action on previously identified items, initial criticality and low power testing No. 14 turbine driven auxiliary feedwater pump - Unit 1, labor problems, monthly surveillance observations, engineered safety feature system walkdown, operational safety verification, security observations, and Unit 1 significant plant events.

Results: Within the areas inspected, no violations were identified.

DETAILS1. Persons Contacted

- \*J. E. Geiger, General Manager, Nuclear Assurance
- \*W. C. Parish, Radiation Support Supervisor/Health Physics
- \*P. L. Walker, Senior Licensing Engineer
- \*L. Giles, Unit 2, Operations Manager
- \*S. H. Head, Supervisor Licensing Engineer
- \*J. W. Loesch, Plant Operations Manager
- \*M. R. Wisenburg, Plant Superintendent, Unit 1
- \*D. A. Leazar, Reactor Support Manager
- \*S. L. Rosen, General Manager, Operations Support
- \*S. M. Dew, Manager, Operations Support
- \*J. J. Nesrsta, Plant Engineer Department Manager
- \*M. A. McBurnett, Manager, Operations Support Licensing

In addition to the above, the NRC inspectors also held discussions with various licensee, architect engineer (AE), constructor and other contractor personnel during this inspection.

\*Denotes those individuals attending the exit interview conducted on April 4, 1988.

2. Initial Criticality and Low Power Testing

On February 27, 1988, the initial approach to criticality ended before criticality was achieved when a reactor trip occurred due to a spurious signal (See NRC Inspection Report 50-498/88-10 for details).

The second approach to initial criticality was started from a boron concentration of 1182 parts per million (ppm). The control rods were stepped out to the pre-trip positions. Initial criticality activities were resumed at a boron dilution rate of 60 gallons per minute per Plant Procedure 1PEP04-ZX-0002, Revision 5, "Initial Criticality."

At 5:08 (CST), on March 8, 1988, Unit 1 achieved initial criticality. All shutdown and control rods were fully withdrawn (259 steps) except Control Bank "D" which was at 170 steps. Criticality was achieved by boron dilution to a concentration of 956 ppm. Equilibrium boron concentration in the Reactor Coolant System (RCS) was 949 ppm, which was within the expected value of 917 plus or minus 50 ppm. Tavg. for the RCS was 565°F.

The NRC inspectors provided around-the-clock coverage of the licensee's activities. The NRC inspectors observed an orderly, well controlled, and professional process that was being directed by the shift supervisor in consultation with the test director and shift advisors.

Subsequent to criticality, the plant was stabilized for base line data taking. Testing witnessed by the NRC inspectors included:

- . 1PEP04-ZX-0004, Revision 3, "Isothermal Temperature Coefficient Measurement." See Section 5 for details.
- . 1PSP03-EW-0010, Revision 5, "Essential Cooling Water Pump 1C Inservice Testing."
- . 1PEP04-ZX-0003, Revision 2, "Boron Endpoint Measurement."

Procedure 1PSP03-EW-0010 could not be performed as written due to a broken system instrument. The NRC inspector verified that the maintenance work request (MWR) was written, the MWR tag installed, and the procedure was changed by a one time only field change request (FCR) 88-0479 to allow testing to proceed. Continuous NRC inspector coverage was terminated March 11, 1988.

On March 22, 1988, the South Texas Project, Unit 1 received a full power license, NPF-76. During the period from initial criticality to full power license, the licensee's operating crews were observed as becoming more familiar with plant operation and more comfortable with the plant and plant programs. During this inspection period, the number of Licensee Event Reports (LER) has decreased significantly over the monthly rates that were observed since low power license issuance (August 1987). Also, to date only one reactor trip has been received, and it was due to maintenance on the secondary system. The licensee's familiarity and compliance to Technical Specifications (TS) and surveillance requirements has also been observed as improving.

No violations or deviations were identified.

3. No. 14 Turbine Driven Auxiliary Feedwater (AFW) Pump - Unit 1

The failed No. 14 AFW pump (see NRC IR 498/88-10, Section 3) was replaced with the No. 24 turbine driven AFW pump (pump only) from Unit 2. Surveillance and functional testing was completed and the pump declared operational. All four AFW pumps were required operational for mode changes leading to the resumption of testing. Additionally, the licensee significantly reduced the number of steam/water packing leaks in the Isolation Valve Cubicles (IVC) and refurbished the local indicating panel for the No. 14 AFW pump turbine.

With the replacement and testing of the No. 14 AFW pump, the cause of the No. 14 AFW pump's erratic behavior and failure of surveillance testing may have been resolved. The licensee is, however, continuing with the verbal and subsequent written commitment (Letter ST-HL-AE-2540, "Auxiliary Feedwater Turbine Driven Pump Operability Consideration") regarding increased surveillance testing intervals for the No. 14 AFW pump.

The NRC inspector monitored the repair/replacement and testing activities associated with this event. The licensee proceeded in a positive, systematic manner in the problem investigation, repair and restoration of this system. The activities were well documented, controlled by procedures, monitored by senior management, and communicated to appropriate Unit 2 staff for consideration in Unit 2 preoperational testing.

During followup activities for the No. 14 AFW pump, the NRC inspector noted the control handles for the dogs on the four watertight doors in the IVCs would come off if used to pull open or close the heavy watertight doors. If this were to happen during an off normal condition, the shear key that holds the handle on the operating shaft could be dislodged and possibly lost, thus preventing egress or ingress to the AFW pump cubicle. This condition was noted to the licensee previously and repaired; however, the repairs, to date, do not prevent the hand wheel from working loose and coming off. A permanent fix to this problem should be identified.

No violations or deviations were identified.

#### 4. Licensee Action on Previously Identified Items

##### (Closed) Open Item (499/8816-03)

This open item concerned the observation of Post-Hydro Preservice nondestructive examination (NDE) inspection for weld joints described per American Society of Mechanical Engineers (ASME) Section XI, IWB-2200(b)(1). The inspection required the observation of Penetrant Test (PT) inspection for welded ferritic material. On March 8, 1988, the NRC inspectors observed PT inspections accomplished on pressurizer heat affected welds. The NRC inspectors found the NDE examiner knowledgeable of criteria and noted that no surface indications were observed for the weld joint inspections witnessed.

##### Electrical Panel Bolting

The NRC had expressed a concern over possible cross-threaded bolts, bolts with only lock washer or flat washer on the back panels of the 480 V Load Center 3E1S1ES60E1B. Inspection of this concern by the licensee revealed that the appearance of cross-threading was due to bolts with lock washers only being pulled through the bolt holes. These bolts were removed and inspected showing no thread damage to either bolts or nuts. The bolts were replaced using an appropriate flat washer and lock washer. This condition appeared to be limited to isolated cases. The NRC inspector confirmed the correct reinstallation of the bolts and washers.

#### 5. Isothermal and Moderator Temperature Coefficient (MTC) Determination Unit 1

During the inspection, the NRC inspectors verified the licensee's determination of MTC and the Isothermal Temperature Coefficient (ITC) per

Station Procedure IPEP04-ZX-0004, Revision 3, "Isothermal Temperature Coefficient Measurement," dated February 25, 1988. The following attributes were observed during the procedure:

- . The RCS was in hot zero power condition with the reactor critical.
- . Neutron Flux level was established per the initial criticality Procedure IPEP04-ZX-0002, Revision 5, dated February 25, 1988, approximately  $2E-7$  or  $2X10^{-7}$  amps local indication on Intermediate Range Meters NI-35 and NI-36.
- . RCS temperature was being maintained constant between 566 and 567 degrees Fahrenheit; actual 566.9 degrees Fahrenheit.
- . RCS pressure was maintained between 2210 and 2260 psig; actual approximately 2232 psig.
- . Boron concentration was being maintained constant at 953 ppm.
- . RCS heatup and cooldown rates were less than specified in the procedure.
- . Values obtained for the ITC and MTC were within the acceptance criteria of the TS.

A subsequent detailed review of test records revealed that a mistake was made in performing the ITC that was not identified during the review process. (See NRC Inspection Report 50-498/88-24 for details.) Although test results remained within the acceptance criteria, the NRC is concerned that the inspection finding may represent a significant weakness in your review process. This issue will be discussed at an enforcement conference in the near future.

#### 6. Labor Problems

On March 1, 1988, labor problems occurred at the South Texas Project. The local business agents (BAs) for the construction electricians (local 716) and pipefitters (local 211) stopped the supervision of field work in Unit 2 by ordering the general foremen and foremen to step down to the craft journeyman level. Subsequently, the constructor provided nonmanual and supervisory personnel to supervise the crafts. There were sufficient craftsmen on site to perform critical construction activities.

Local law enforcement authorities were contacted because some fights occurred in the parking lots and some company vehicle tires were slashed.

The licensee placed a hold on all the affected construction crafts badges for Unit 1 to preclude illegal work activities pending resolution of the work stoppage issues.

On March 2, 1988, the local BAs instructed the general foremen and foremen to return to their positions while talks were underway. The issues appear

to be centered around the pay scale for crafts after a plant system is turned over to the licensee. The work is covered by two separate contracts with the work on plant systems under construction being paid at a higher rate per hour than work on plant systems that have been turned over to the licensee.

#### 7. Monthly Surveillance Observations

The NRC inspector observed selected portions of surveillance testing and reviewed completed data packages to verify that TS requirements are being met for safety-related systems and components. The following surveillance tests were observed:

- . 1PSP03-DG-0002, Revision 5, "Standby Diesel 12 Operability Test"
- . 1PSP03-DG-0003, Revision 4, "Standby Diesel 13 Operability Test"
- . 1PSP03-EW-0010, Revision 5, "Essential Cooling Water Pump 1C Inservice Test"
- . 1PSP02-EH-6328, Revision 1, "Turbine Throttle Valve Trip Actuating Device Operational Test (TACOT)"
- . 1PSP05-EH-6328, Revision 0, "Turbine Throttle Valve Limit Switch Calibration"

The NRC inspectors verified the following items during the inspection:

- . Test results were reviewed by personnel other than the persons directing the test.
- . The surveillance testing was completed at the required frequency per TS requirements.
- . Testing was performed by qualified personnel using approved procedures.
- . Systems that were tested were restored to their correct alignment.

During the performance of Procedure 1PSP03-DG-0003, the NRC inspector noticed that after the diesel generator was loaded to approximately 5500 kw in accordance with the procedure, the reactor operator adjusted the generator load using the governor switch on the main control board. The procedure did not instruct the operator to operate the governor switch. When questioned about this, the reactor operator stated that this step was being performed in accordance with Procedure 1POP02-DG-0003, Revision 5, "Emergency Diesel Generator No. 13." Step 7.1.12 of the referenced procedure allows the reactor operator to adjust the generator load using the governor switch. Even though both procedures are used to perform the surveillance test, a FCR 87-2987 had been issued to eliminate

the need for the attachment of both procedures to the surveillance test. The acceptance criteria was met for the test and all data was recorded and reviewed in accordance with requirements of the procedure.

Also, during the performance of Procedure 1PSP03-DG-0003, the NRC inspector noticed that when the diesel generator start button was depressed the "Diesel Generator (DG) No. 13 Trouble Alarm" annunciator on the main control board illuminated. The annunciator remained illuminated for approximately 40 minutes of the 1-hour DG run before the auxiliary operator stationed at the local control panel was instructed to reset the alarm.

The procedures, as they are written, do not instruct the operators to acknowledge and reset the annunciator. The NRC inspector questioned the reactor operator about his justification for continuing to run and load the diesel generator without acknowledging the alarm and verifying if the diesel was indeed experiencing troubles. The reactor operator stated he had reset the alarm on the main control board but the auxiliary operator must also reset this alarm on the local control panel to extinguish the annunciator lamp on the main control board. This was not done because the auxiliary operator did not notice the alarm on the local panel. The reactor operator further stated that he would have let the diesel continue to run for its 1-hour run even if the annunciator had remained illuminated but would have issued a MWR to identify and correct the problem if one had existed. The NRC inspector discussed this concern with licensee management. The acceptance criteria of the test was met and documented.

No violations or deviations were identified.

#### 8. Engineered Safety Feature (ESF) System Walkdown

The NRC inspector walked down accessible portions of the following safety-related systems to verify system operability. A review was performed to confirm that the licensee's system operating procedure matched plant drawing and the as-built configuration. Equipment condition, valve position, breaker position, housekeeping, labeling and support subsystems essential to actuation of the ESF system were noted. The systems were walked down using the drawings and procedures as follows:

- Containment Spray System, Train "A" Procedure 1POP02-CS-0001, Revision 0, Drawing 5N109F05037, Revision 12
- Containment Spray System, Train "B", Procedure 1POP02-CS-0001, Revision 0, Drawing 5N109F05037, Revision 12
- Containment Spray System, Train "C", Procedure 1POP02-CS-0002, Revision 0, Drawing 5N109F05037

The NRC inspector noted the following observations pertaining to the containment spray system:

- a. Evidence of boron crystallization was observed on the flange which housed flow element FE-813 and the swagelock fittings for Valve CS0030A. Since the system was not operating at the time of the inspection, leakage from the referenced sources were not observed. However, the presence of boron crystals indicates leakage has occurred. This observation was noted to the shift supervisor.
- b. There were some physical difference between the plant as-built conditions and the Piping and Instrumentation Diagram (P&ID) 5N109F05037 used to walkdown the systems. Several permanently installed valves on the spray additive tanks were not identified on the P&IDs. Bechtel engineering personnel stated that the valves were identified on Installation Detail Drawing 5Z489Z45037, sheet 2, Revision 0, for the spray additive tanks. The NRC inspector reviewed the detail drawings and verified that the valves were identified and shown to reflect as-built conditions of the tanks. Also, Bechtel Design Standard M, J 2.4.4 Revision 3, identified the valves in question as root valves. Steps 3.3 of the referenced standard states that root valves are not identified on P&IDs. A system is in place to track and identify these valves installed in safety-related systems.

No violations or deviations were identified.

#### 9. Operational Safety Verification

The objectives of this inspection were to ensure that the plant is being operated in a safe manner and in conformance with regulatory requirements, the licensee's management controls are effective in discharging their responsibilities, and that selected activities of the radiological protection programs are performed in accordance with plant policies and procedures.

The NRC inspector observed the activities in the control room on a daily basis to verify if:

- . Proper control room staffing was being maintained.
- . Operators were adhering to approved procedures and TS requirements.
- . Logs, recorder traces, panel indications, switch positions and annunciators complied with appropriate requirements.

The NRC inspector observed on several occasions during certain plant evolution (such as mode changes) the area identified by the licensee as "At-The-Controls Area" becomes extremely congested. As many as 14 people have been observed in the At-The-Controls Area. Discussion with several of these individuals indicated that they were there out of curiosity or were auxiliary operators and technicians awaiting instruction to perform a certain task. Also, there were occasions when the NRC inspector noticed that drawings and other documentation not in use were

not in their designated locations. During one visit to the control room, the NRC inspector noticed items such as a hammer and test instruments were lying on tables inside the designated At-The-Controls Area. This concern was brought to the attention of the shift supervisor and subsequent visits to the control room indicated that these conditions had been rectified.

The NRC inspector conducted tours throughout the plant to observe work in progress. The use of personnel dosimetry, barriers, and radiological work habits were observed. Housekeeping practices and physical conditions of safety-related equipment was observed. Observations that were minor in nature were discussed with the licensee and resolved in a timely manner.

No violations or deviations were identified.

#### 10. Security Observations

The NRC inspectors verified the physical security plan was being implemented by selected observation of the following items:

- . The security organization was properly staffed.
- . Packages and personnel were properly checked before entry into the Protected Area (PA) was permitted.
- . Vital area barriers were maintained and not compromised by breaches or weakness.
- . Security monitors in the control and secondary alarm stations were functioning properly.
- . The PA barrier was maintained and the isolation zone was free of openings that could be used to penetrate the barrier.
- . Illumination in the PA was adequate to observe all areas during hours of darkness.

On two occasions, the NRC inspector witnessed the posting of compensatory guards. Once was when the roof access to the IVC was removed for No. 14 AFW pump replacement and the other was when the main equipment door on the 65-foot level of the Machinery Auxiliary Building was opened for removal of material. These postings were prompt and the patrol officers were observed as being attentive to their post.

No violations or deviations were identified.

#### 11. Unit 1 Significant Plant Events

The following events which resulted in a licensee notification to the NRC occurred during this inspection period. They have been evaluated for immediate safety concerns and the licensee actions are being followed by

the resident inspectors. These events will be addressed in future inspection reports as the required corrective action is completed by the licensee.

- a. This event involved the licensee's identification of nonperformance of a TS surveillance test for Train "C" Essential Cooling Water Screen Wash Booster Pump.

- . Occurred March 11, 1988
- . Reported to NRC March 11, 1988
- . LER No. 88-023

A quarterly surveillance test conducted in December 1987 resulted in the pump being placed on the "alert" list due to higher than predicted flow. By ASME, Section XI requirements, the testing frequency of this pump was to be doubled. The communication chain for the change in testing frequency failed and the test was not scheduled as required. The licensee has previously missed surveillance frequency requirements.

- b. This event identified a design error that could block a safety injection actuation during specific plant conditions.

- . Occurred March 17, 1988
- . Reported to NRC March 17, 1988
- . LER No. 88-024

During testing, the licensee identified that operating the safeguards test cabinet master reset switch with the reactor trip breaker open would reset and block safety injection actuation on the associated train.

- c. All trains of control room envelope heating, ventilating and air conditioning (HVAC) went into recirculation (an ESF mode) on a high radiation signal.

- . Occurred on March 3, 1988
- . Reported to NRC March 3, 1988
- . LER No. 88-025

This event occurred during maintenance. No high radiation signal was recorded on the plant computer. Diagnostic tests and attempts to duplicate the event were unsuccessful.

- d. Reactor trip and safety injection.

- . Occurred on March 30, 1988
- . Reported to NRC March 30, 1988
- . LER No. 88-026

The event occurred as a result of troubleshooting on the nonsafety-related main generator trip relay wiring problems. This event appears to be an operator (I&C technician) error involving an inadequate review of drawings prior to beginning troubleshooting.

These events and the details of their occurrence have been reviewed and no violations or deviations were identified.

12. Exit Interview

The NRC inspector met with licensee representatives (denoted in paragraph 1) on April 4, 1988, and summarized the scope and findings of the inspection. Other meetings between NRC inspectors and licensee management were held periodically during the inspection to discuss identified concerns.