

APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-498/88-04
50-499/88-04

Operating License: NPF-71
Construction Permit: CPPR-129

Dockets: 50-498
50-499

CP Expiration Date: December 1989

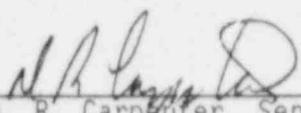
Licensee: Houston Lighting & Power Company (HL&P)
P. O. Box 1700
Houston, Texas 77001

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

Inspection At: STP, Matagorda County, Texas

Inspection Conducted: January 1-31, 1988

Inspectors:



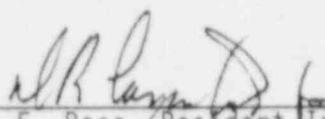
D. R. Carpenter, Senior Resident Inspector
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3-21-88
Date



E. P. Hildebrand, Resident Inspector, Project
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3/15/88
Date



J. E. Bess, Resident Inspector, Project
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3-21-88
Date

Approved:



G. L. Constable, Chief, Project Section D
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3/21/88
Date

Inspection Summary

Inspection Conducted January 1-31, 1988 (Report 50-498/88-04; 50-499/88-04)

Areas Inspected: Routine, unannounced inspection including main feedwater hydraulic transients - Unit 1; standby diesel generator initial start - Unit 2; monthly surveillance observations, operational safety verification - Unit 1; significant plant events, engineered safety feature system walkdown, review of startup test procedures - Unit 1; and site tours.

Results: Within the areas inspected, one violation was identified in paragraph 2 which dealt with a main feedwater hydraulic transient.

DETAILS

1. Persons Contacted

- *M. A. McBurnett, Manager, Support Licensing
- *A. C. McIntyre, Manager, Support Engineer
- *M. R. Wisenburg, Plant Superintendent, Unit 1
- *H. H. Johnson, Operations Manager, Unit 1
- *J. J. Nesrsta, Plant Engineer Manager
- *G. L. Jarvela, Health Physics Manager
- *G. E. Schinzel, BOP Section Supervisor - PED
- *R. A. Swanson, Main Feedwater System Engineer - PED
- *S. M. Head, Supervisor, Licensing Engineer

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 exit interviews conducted on February 3, 1988.

2. Main Feedwater Hydraulic Transients - Unit 1

During this inspection period, the main feedwater system was subjected to several hydraulic transients while feeding the steam generators. The transients occurred on January 11, 1988, with Unit 1 in Mode 5.

The following is a description of the occurrences:

- . The steam generator operating levels were to be increased using main feedwater as the source of water for chemistry considerations. The main feedwater temperature was being maintained at approximately 290°F using a recirculation path through the full flow deaerator to maintain water chemistry. The steam generator temperatures were approximately 180°F.
- . The feedwater initial flowpath used was to the upper steam generator feed nozzle from the main feed system via the preheater bypass line. The preheater bypass line is the cross tie from main feed to the auxiliary feed piping which enters the steam generator via the upper nozzle.
- . Steam Generator "C" was filled using the above flowpath and a slight clicking of the downstream check valve was noted but no piping noise or vibration.
- . While feeding Steam Generator "B" using this flowpath, a stationed observer reported noise and vibration in the preheater bypass and auxiliary feedwater lines. Flow was terminated and

the noise and vibration stopped. Feed flow was subsequently restored to Steam Generator "B" using the same flow path as before and no noise or vibration was experienced.

The same flowpath to the upper nozzle was then utilized to fill Steam Generator "A" which resulted in piping noise and vibration. When flow was secured, noise and vibration stopped. Flow was then secured to all steam generators.

Steam Generator "C" was filled again using the main feedwater line to the lower feed nozzle via the main feedwater bypass valve resulting in observed piping noise and vibration. Flow was secured and the noise and vibration stopped.

The licensee has submitted letter ST-HL-AE-2483, dated January 18, 1988, to the NRC which addresses the above hydraulic transients.

The licensee has determined that the hydraulic transients were caused by steam condensation downstream of the feedwater bypass control valve (FBCV). Due to the difference in temperature between the incoming feedwater (290°F) and the steam generator (180°F) and the resulting difference in system pressure's feed pressure dropped below its saturation pressure downstream of the FBCV and flashed to steam. When the steam came in contact with the relatively cold water downstream of the FBCV, steam condensation occurred causing a hydraulic transient. The licensee has visually inspected the affected piping and performed nondestructive examinations. No adverse indications were identified.

The procedure used to fill the steam generator, IPOP03-ZG-0003, "Secondary Plant Startup," did not address feedwater and steam generator pressure and temperature limitations other than to prevent feeding to the steam generator lower nozzle if main feedwater temperature is less than 250°F.

This evolution could have been performed by procedure at a higher differential temperature than that which caused the events described above. This action potentially could have caused damage to the main feedwater or auxiliary feedwater systems or steam generators.

The inadequacies of the secondary plant startup procedure as described above are considered an apparent violation of NRC requirements (498/8804-01).

The fact that the senior operations personnel supervising the evolution continued feeding the steam generators after being notified of noise and vibration in the feed systems is considered poor operating practice. The licensee's corrective actions to prevent recurrence and increase awareness of personnel with regard to actions to take when an operational problem is encountered will be considered as elements to be addressed in the closure of this apparent violation.

3. Standby Diesel Generator (SDG) Initial Start - Unit 2

On January 6, 1988, the SDG initial start and run was performed for SDG 22. This evolution was witnessed by the resident inspector. The following observations were made.

- . A pretest briefing was held for all involved personnel by the test engineer. The briefing was thorough and addressed each persons role. Particular attention was given to covering methods of engine shutdowns during normal or emergency conditions.
- . An engine checklist was being utilized as the initial start procedure. The checklist appeared adequate to support the evolution and was being followed by the test engineer.
- . The engine started on the first attempt. After running for several minutes, a low lube oil pressure trip signal was received. Subsequent troubleshooting revealed that lube oil pressure was satisfactory. The trip was caused by air in the instrument lines. The instrument lines were vented and the engine restarted.

The engine was tripped several more times while setting the overspeed trip.

One area of concern was brought to the attention of the test engineer and the startup supervisor in that no logs were being maintained on engine and support system parameters. This was also discussed with the STP project manager. This concern was corrected prior to subsequent engine runs.

- . Prior to the first start attempt, an NRC inspection was made of the entire area for housekeeping, incomplete work, fire hazards, and fluid leakage. The general housekeeping was good. The diesel generator, support systems, building spaces, and electrical control panels were clean. No tools were left out of toolboxes. Oily rags were properly stored in approved containers. Minor fuel oil leakage was observed around the inline fuel oil filters but was easily controlled. No evidence of lube oil, water, or air leakage was noted from engine support systems. All support system assemblies appeared to be complete. No missing fasteners were evident. The engine valve covers were removed for inspection purposes.
- . Fire protection systems were operational for the SDG bay and several fire extinguishers were available throughout the area.

Overall, this evolution was well controlled by the test engineer and was conducted in a safe manner.

No violations or deviations were observed.

4. Monthly Surveillance Observations

The NRC inspector reviewed and observed the performance of Plant Surveillance Procedure 1PSP03-CC-0010, "Component Cooling Water System Miscellaneous Valve Operability Test," Revision 4. The procedure was reviewed for technical adequacy, test instrumentation was verified to be in calibration, test data was reviewed for accuracy and completeness, and the restoration of components to the required position after testing was observed.

The NRC inspector witnessed the cycling of valves in the Component Cooling Water System to verify isolation/closing times as required by TS 4.5.3.1 and 4.6.3.3. During the verification of the valve isolation times, the NRC inspector noticed that two valves identified as FV-4540 and FV-4541 indicated what appeared to be erratic seating characteristics. The valves appeared to bounce off of their seats, thus causing the indicator lights on the main control board to indicate an opened and closed position simultaneously. The licensee issued Maintenance Work Requests (MWRs) to identify and correct the problem. The NRC inspector verified that the licensee took appropriate corrective action as required by the procedure. No other discrepancies were noted and the surveillance procedure was completed satisfactorily.

No violations or deviations were identified.

5. 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 the responsibilities, and that selected activities of the radiological protection programs are performed in accordance with plant policies and procedures.

The NRC inspectors visited the control room on a daily basis and verified that control room staffing was adequate, operator behavior was professional, shift turnover was thorough, adherence to technical specification (TS) limiting conditions for operation was maintained, and overall control room activities were being conducted in accordance with NRC requirements.

During one visit to the control room, the NRC inspector noticed that the audible count rate for monitoring startup rate (neutron flux) could not be heard in the control room. The NRC inspector questioned the shift supervisor about the operability of the audio count rate signal. The shift supervisor informed the NRC inspector that the system was operable but was turned down because it was considered a nuisance to control room personnel. The shift supervisor further stated that there was no procedure or TS requirements requiring the count rate to be audible during Mode 5 plant condition. During subsequent visits to the control room, the

NRC inspector verified that the audible count rate could be heard throughout the control room.

The NRC inspectors conducted tours throughout the plant to observe work in progress. The use of personnel dosimetry, barriers, and radiological work habits was 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.

6. 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 when the required corrective action is completed by the licensee.

- a. The lifting of the reactor coolant system (RCS) pressurizer power operated relief valve (PORV) caused by exceeding delta-T (temperature) between the RCS and steam generators.

- . Occurred on January 2, 1988
- . Reported to NRC January 2, 1988
- . Licensee Event Report (LER) No. 88-001

This event appeared to be the result of the licensee starting a reactor coolant pump when the plant was solid with the secondary side of the steam generators at a higher temperature than the RCS. Procedure inadequacy and lack of operator training are elements that led to this event.

- b. Limit switch adjustments were made to safety-related motor operated valves (MOVs) without performing an acceptable local leak rate test (LLRT) as required by the Post Maintenance Test Manual.

- . Discovered January 6, 1988
- . Reported to NRC January 6, 1988
- . LER No. 88-002

A lack of training on postmaintenance testing (PMT) requirements and an inadequate review of PMT data for acceptability are contributing causes to this event.

- c. An AC bus was deenergized resulting in a loss of power to the control room envelope toxic gas analyzer causing control room HVAC recirculation actuation.

- . Discovered January 6, 1988
- . Reported to NRC January 6, 1988
- . LER No. 88-003

This actuation is a recurring problem. Control room HVAC recirculation is subject to frequent engineered safety feature (ESF) system actuation. Improper nonlicensed operator action and procedure inadequacies appear to have led to this particular event.

- d. The toxic gas monitor received a "Prom Error 3" failure signal causing control room heating, ventilating, and air conditioning (HVAC) recirculation actuation.

- . Discovered January 10, 1988
- . Reported to NRC January 10, 1988
- . LER No. 88-004

This event was caused by a printed circuit card failure.

- e. Incorrect reading on a radiation monitor resulting in a missed surveillance.

- . Discovered January 10, 1988
- . Reported to NRC January 10, 1988
- . LER No. 88-005

This event appeared to be a combination of human factors/equipment/procedure problems in that the radiation monitor was left with the setpoint displayed and was not providing a current reading. The radiation monitoring unit did not indicate that the value being displayed was the alarm set point.

- f. A master relay test and its surveillance procedure did not satisfy the applicable TS requirement.

- . Discovered January 12, 1988
- . Reported to NRC January 12, 1988
- . LER No. 88-006

This deficiency was identified by the licensee during an engineering review. The licensee took a conservative approach and declared that the TS requirement had not be met.

- g. Incorrect airflow capacity design calculations were made on control room HVAC HEPA/Charcoal filter.

- . Discovered January 15, 1988
- . Reported to NRC January 15, 1988
- . LER No. 88-007

This event dealt with errors discovered in the air density number used in the design calculations on control room HVAC. This resulted in airflow rates that were slightly in excess of prescribed tolerance.

- h. Raychem electrical splices were incorrectly installed.

- . Discovered January 20, 1988
- . Reported to NRC January 20, 1988
- . LER No. 88-008

This is a followup of a 10 CFR 50.55(e) item identified during Unit 1 construction. An unverified splice was identified by an NRC inspector. The licensee is performing a reinspection of Unit 1, safety-related splices.

- i. With Mode 1 logic present an ESF sequencer actuation occurred.

- . Occurred on January 23, 1988
- . Reported to NRC January 23, 1988
- . LER No. 88-009

This event resulted from an inadequate surveillance procedure that omitted a required switch position. When the surveillance was performed by the instrument technician according to the procedure requirement, an ESF sequencer was actuated.

- j. No periodic surveillance testing had been performed on the charging header low pressure input to close containment isolation valves for reactor coolant pump seal water during a safety injection.

- . Occurred on January 26, 1988
- . Reported to NRC January 26, 1988
- . LER No. 88-010

This condition was identified by the licensee as a result of an engineering review. It had not been previously identified as a containment isolation valve and would shut only if the charging header experienced a low pressure in conjunction with an isolation signal.

- k. The performance of a surveillance test on "B" Train essential chilled water pump inservice test was not performed by due date nor during the permitted grace period.

- . Occurred on January 27, 1988
- . Reported to NRC January 27, 1988
- . LER No. 88-011

This event resulted from inadequate administrative controls.

1. Valve CV-FCV-0205 did not have its stroke time measured as required by the Pump and Valve Inservice Test Plan (PVITP)

- . Occurred on January 29, 1988
- . Reported to NRC January 29, 1988
- . LER No. 88-012

This event resulted from an inadequate procedure, 1PSP03-CV-0011. The procedure failed to specify that a stroke time was required per the PVITP.

Additional evaluation of some of these events is documented in other NRC reports.

No violations or deviations were identified.

7. Engineered Safety Feature (ESF) System Walkdown

The NRC inspector conducted a complete walkdown of Train "C" of the Safety Injection System to independently verify the operability of the system. The NRC inspectors performed a review to ascertain whether the licensee's system lineup procedure matched plant drawings and the as-built configuration. Equipment condition, valve position, housekeeping, and valve and instrument indication and calibration data were all reviewed.

During this inspection, the NRC inspector identified the following items to licensee management:

- a. There were excessive water puddles in Train "C" and Train "B" pump rooms. The leakage in Train "C" pump room was caused by a valve identified as CS-009C. Also associated with the leakage identified above was the crystallization of boron between the valve flanges and valve body.

The source of leakage in the Train "B" pump room was not identified by the NRC inspectors.

- b. MWR Tag No. 58815 did not have all pertinent data recorded on the tag. The MWR tag was attached to a containment spray test line isolation valve identified as CS0009C and did not have a signature, date, or time. Plant General Procedure OPGPP03-ZM-003, Revision 15, step 4.3.9(c) states that "the time, date and signature shall be entered on both parts of the MWR tag." This appeared to be an isolated case of failure to record pertinent data.

The NRC inspectors verified that the licensee took corrective action by writing in all the required information on the MWR tag.

No violations or deviations were identified.

8. Review of Startup Test Procedures - Unit 1

During this inspection period, the NRC inspectors reviewed the following startup test procedures:

- . 1PEP04-ZL-0050, "Test Sequence for Hot Precritical Testing," Revision 5
- . 1PEP04-ZX-0002, "Test Sequence for Initial Criticality and Low Power Testing," Revision 5
- . 1PEP04-ZL-0024, "Rod Drop Time Measurements," Revision 2

In the areas reviewed, the procedures appear to be consistent with regulatory requirements and IS.

No violations or deviations were identified.

9. Potential Marijuana Use

An NRC inspector, while visiting the restroom in the main administration building, believed he identified the strong odor of marijuana smoke. He could not identify the source. Upon returning to the resident inspectors' office he notified the licensee's security department. The security department responded immediately but could not find direct evidence of marijuana use. The security force was briefed on this occurrence at shift relief. They were instructed to ensure low use areas were checked during their normal rounds. The next weekend dogs trained in drug detection were brought on site. No illicit drugs were found. The licensee has a positive drug program and responded quickly to this issue in an appropriate manner.

10. Site Tours - Unit 1

During this inspection period, the NRC inspectors conducted site tours of all plant areas of both units. Observations have been discussed with licensee management. Those observations requiring licensee attention were resolved in a responsive and timely manner.

The NRC inspector witnessed the conduct of security department operations during this inspection period. Activities observed were conduct of operations in the Central Alarm Station (CAS) and Secondary Alarm Station (SAS), CAS and SAS log keeping, security response to alarms, badge issue area operation, physical search practices of individuals and vehicles, and compensatory posting of security offices. The above activities witnessed by the NRC inspectors were in compliance with licensee procedures and performed in a professional manner.

The NRC inspector witnessed the conduct of the Health Physics (HP) department during the inspection period. The NRC inspectors witnessed the use of HP equipment by HP technicians as well as plant workers, use of

radiation work permits (RWPs), and general conduct of shift HP activities. The HP activities appeared to be in compliance with licensee procedures.

Plant maintenance activities were witnessed by the NRC inspectors during the repair process of the various plant system failures during the inspection period.

Some general observations made during plant tours and discussed with licensee management were:

- a. Several NRC inspectors have independently made the observation that in the reactor containment building and the machinery auxiliary building there were a large number of valves, flanges, and fittings that displayed evidence of leakage. The leakage is evidenced by boron crystals. The licensee had identified a large number of these leaks and tagged them for repair with MWR tags. However, the NRC inspectors have identified several others not noted on the licensee's list. Recognizing that there are competing activities for the resources available, failure to appropriately address the issue of primary leakage prior to initial criticality could cause problems for operation and maintenance activities in the future. This could become a radiological concern. The licensee acknowledged this concern and committed to providing additional attention to this issue.
- b. Numerous plant areas had burned out lighting and lighting circuits that were not serviceable. Some areas had no lighting at all, for example, the RCS charging pump rooms (2 out of 3 rooms). This condition created a personnel safety problem. The licensee committed to address this issue.

No deviations or violations were identified.

11. Exit Interview

The NRC inspectors met with licensee representatives (denoted in paragraph 1) on February 3, 1988, and summarized the scope and findings of the inspection period. Other meetings between NRC inspectors and licensee management were held periodically during the inspection to discuss identified concerns. The licensee did not identify as proprietary any of the material provided to or reviewed by the NRC inspectors during this inspection.