

APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-382/86-02

License: NPF-38

Docket: 50-382

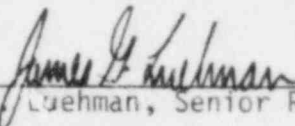
Licensee: Louisiana Power & Light Company (LP&L)
142 Deiaronde Street
New Orleans, Louisiana 70174

Facility Name: Waterford Steam Electric Station, Unit 3 (W3 SES)

Inspection At: Taft, Louisiana

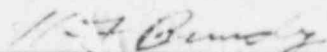
Inspection Conducted: January, 1-31, 1986

Inspectors:



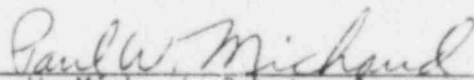
J. G. Luehman, Senior Resident Inspector

2/27/86
Date



H. F. Bundy, Project Inspector, Project
Section C, Reactor Projects Branch


2/27/86
Date



P. W. Michaud, Reactor Inspector,
Operations Section, Reactor Safety Branch


2-27-86
Date

Approved:



G. L. Constable, Chief, Project Section C,
Reactor Projects Branch

2/27/86
Date



R. E. Ireland, Chief, Operations Section,
Reactor Safety Branch

2/27/86
Date

Inspection Summary

Inspection Conducted January 1-31, 1986 (Report 50-382/86-02)

Areas Inspected: Routine, unannounced inspection of: (1) Plant Status; (2) Monthly Maintenance; (3) Monthly Surveillance; (4) ESF System Walkdown; (5) Routine Inspection; (6) Licensee Event Report (LER) Followup; (7) Followup of Previous Inspection Items; (8) Startup Report Review; (9) Followup on Potential Generic Problems; (10) Inspection and Enforcement Bulletins; (11) Allegation Followup; and (12) Inoperable Containment Spray Pump. The inspection involved 153 inspector-hours onsite by three NRC inspectors.

Results: Within the areas inspected, two apparent violations were identified (failure to meet limiting condition for operation, paragraph 14 and failure to establish adequate written procedures, paragraph 6). One unresolved item was identified (failure to document evaluation of incident concerning dropped control element assembly, paragraph 14).

DETAILS

1. Persons Contacted

Principal Licensee Employees

- R. S. Leddick, Senior Vice President, Nuclear Operations
- *R. P. Barkhurst, Plant Manager, Nuclear
- T. F. Gerrets, Corporate QA Manager
- S. A. Alleman, Assistant Plant Manager, Plant Technical Staff
- J. R. McGaha, Assistant Plant Manager, Operations and Maintenance
- J. N. Woods, QC Manager
- A. S. Lockhart, Site Quality Manager
- R. F. Burski, Engineering and Nuclear Safety Manager
- K. L. Brewster, Onsite Licensing Engineer
- G. E. Wuller, Onsite Licensing Coordinator
- T. H. Smith, Maintenance Superintendent, Nuclear
- *N. S. Carns, Assistant Plant Manager, Nuclear, Operations and Maintenance

*Present at exit interviews.

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.

2. Unresolved Items

An unresolved item is a matter about which more information is required to determine whether it is acceptable or may involve a violation or deviation.

One unresolved item was identified during this inspection and is discussed in paragraph 9.

3. Plant Status

At the beginning of the inspection period, the plant was operating at full power. At 2:52 p.m. (CST) on January 7, 1986, a reactor trip took place. The trip was the result of low departure from nucleate boiling ratio (DNBR) signals generated on all four core protection calculator (CPC) channels when Control Element Assembly (CEA) 31 dropped to the fully inserted position. The CEA dropped due to a failed circuitry card. The faulty card was subsequently replaced and the plant restarted. On January 8, 1986, at 10:43 a.m., with the plant at approximately 40% power, CEA 31 dropped to the fully inserted position. This event was caused by personnel working in the area. The breaker was subsequently reclosed and the CEA recovered.

At 5:17 p.m. on January 22, 1986, with the plant again at full power, the reactor tripped on low DNBR. The trip was the result of CEA 88 dropping to the fully inserted position. Licensee subsequently discovered the power supply breaker for CEA 88 in the open position. Further evaluation revealed various electronic components associated with the CEA had failed causing the breaker to open. Repairs were made and the plant attained full power on January 24, 1986.

The plant remained at or near full power for the remainder of the inspection period.

No violations or deviations were identified.

4. Licensee Event Report (LER) Followup

The following LERs were reviewed and closed. The NRC inspectors verified that reporting requirements had been met, that causes had been identified, that corrective actions appeared appropriate, that generic applicability had been considered, and that the LER forms were complete. Additionally, the NRC inspectors confirmed that no unreviewed safety questions were involved and that violations of regulations or Technical Specification (TS) conditions had been identified.

- | | |
|--|--|
| (Closed) 382/85-03 | Partial Engineered Safety Features Actuation |
| (Closed) 382/85-18 | Reactor Trip and Reactor Coolant System Leak |
| (Closed) 382/85-22,
Revisions 0 & 1 | Automatic Actuation of Reactor Protective System |
| (Closed) 382/85-46 &
382/85-50 | Fire Watch Irregularities,
Deficient Fire Watch Tours - It has been reemphasized to the licensee that fire watch tours are compensatory measures for existing fire detection/protection system deficiencies and must be properly conducted. |
| (Closed) 382/85-02 | Engineered Safety Features Actuation on Control Room Isolation |
| (Closed) 382/85-04 | Inadvertent Trip |
| (Closed) 382/85-05 | Engineered Safety Features Actuation on Control Room Isolation |
| (Closed) 382/85-06 | Inadvertent Containment Spray Actuation - The licensee inspected all equipment in containment for damage, installed Station |

Modification 760 which now permits prompt restoration of coolant to the seal coolers and precludes inadvertent isolation, and examined the possibility of total RCP seal failure which was found to be not credible.

(Closed) 382/85-25

Faulty Emergency Diesel Generator Relay - During review of test data on June 20, 1985, for a surveillance test performed on June 11, 1985, operations personnel discovered a relay was outside the tolerance band in Emergency Diesel Generator B automatic load sequence timer. They realized that a mode change made earlier that same day was in violation of TS. They complied with the action statement associated with TS 3.8.1.1 and subsequently replaced the faulty relay. Memorandum W3085-0205 advising shift supervisors of their responsibilities to ensure all TS requirements are satisfied prior to making a mode change was issued by the operations superintendent on September 25, 1985.

(Closed) 283/85-43

Control Room Isolation Due to HVAC Maintenance.

No violations or deviations were identified.

5. Followup of Previous Inspection Items

(Closed) Violation 382/8516-01 - This violation involved the failure to change Off-Normal Operating Procedure OP-901-022, Revision 1, to reflect Station Modification Package 760 design changes. Changes included automatic isolation of component cooling water (CCW) to the reactor coolant pump integral seal cooler on high temperature instead of high pressure and provision for the operators with capability to reopen a closed CCW isolation valve from the control room. Revision 2 of this procedure reflects these changes. Also, a quality assurance report dated September 3, 1985, contained evidence that operations personnel had been instructed to be more thorough in reviewing procedures.

(Closed) Violation 382/8516-02 - This violation involved the failure of an operator to properly follow a procedure in shutting down the boric acid concentrator. This failure, in conjunction with failure of a valve to reseal, ultimately resulted in primary coolant contamination of the secondary coolant system. The licensee installed Station Modification 461 to prevent recurrence of this event. Also, a quality assurance report dated September 3, 1985, contained evidence that operations personnel had been reinstructed to properly use procedures.

(Closed) Violation 382/8516-03 - This violation involved failure of operations personnel to properly evaluate a fire protection impairment and take appropriate compensatory actions. Control room personnel immediately evaluated the impairment. Meeting minutes dated July 25, 1984, titled "Summary of Weekly Operations Supervisor Meetings," indicate that operations personnel were instructed by the operations superintendent to be more cognizant of the fire door related impairments.

(Closed) Violation 382/8520-05 - This violation resulted from making a mode change without satisfying all surveillance requirements. Licensee Event Report 85-025 was issued by the licensee and is closed elsewhere in this report. The shift supervisors were advised of their responsibility to satisfy all surveillance requirements prior to making a mode change by Memorandum W3085-0205 issued by the operations superintendent on September 25, 1985.

6. Monthly Maintenance

Station maintenance activities affecting safety-related systems and components were observed/reviewed to ascertain that the activities were conducted in accordance with approved procedures, regulatory guides and industry codes or standards, and in conformance with TS.

Included in this month's observations was work on the Chemical and Volume Control System (CVCS) Panel A heat trace conducted under CIWA 024385 and work on Core Protection Calculator (CPC) Channel B, Loop 1, that was conducted under CIWA 024424. In addition to verifying the work was properly authorized and that procedures were used, the NRC inspector checked all measuring and test equipment (M&TE) for proper calibration.

The NRC inspector reviewed the documentation of the corrective maintenance done to the Essential Chilled Water Chiller Unit A under CIWA 024584. The unit had tripped and was declared inoperable just prior to the plant startup on the afternoon of January 23, 1986. Entry into the ACTION requirements of TS 3.7.12 prevented the plant from changing modes and so work began immediately to find and correct the problem. The timer on the chiller unit was determined to have been the problem and it was repaired. According to the plant logs, it appeared that some type of retest had been performed to prove operability during the time between the restart of the chiller and the time it was declared operable. This was verified by the NRC inspector through discussions with licensee operations personnel. However, the CIWA did not contain any specific retest requirements, nor does it record any retest results. Regulatory Guide 1.33, Revision 2, to which the licensee is committed in Chapter 17 of the FSAR, endorses ANSI N 18.7 - 1976. These documents together require that written procedures for maintenance on safety-related equipment be established and that those procedures include retest requirements and record results. The failure to specify and record retest results following completion of CIWA

024584 is a violation of the provisions of TS 6.8.1 which requires establishing and implementing those procedures delineated by Regulatory Guide 1.33, Revision 2 and ANSI N 18.7 - 1976 as discussed above and is identified as 50-382/8602-04.

No additional violations or deviations were identified.

7. Monthly Surveillance

The NRC inspectors observed/reviewed TS required testing and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that limiting conditions for operation (LCO) were met, and that any deficiencies identified were properly reviewed and resolved.

A review of OP-903-001, Revision 2, "Technical Specification Surveillance Logs," revealed a potential problem area. TS require numerous logs be taken at an interval of "at least once per 12 hours." Procedure OP-903-001 requires that readings be taken once per shift, with a shift being 8 hours long. This being the case, log readings could be taken up to 16 hours apart, exceeding the requirements of TS (even if the extension allowed by TS 4.0.2.a is included.) Procedure OI-004-000, Revision 2, "Watch Station and Shift Logs," states that log readings should be taken during the first 2 hours of the shift. If this suggestion was a requirement, then exceeding TS time limits would not be possible using a three 8-hour shift rotation. Log review does not indicate any violations of the TS but it does indicate that all entries are not routinely made during the first 2 hours of the shift. This being true leaves open the possibility of an operator following the existing procedural requirements and still violating the TS requirements.

No violations or deviations were identified.

8. Engineered Safety Features (ESF) System Walkdown

The Essential Services Chilled Water System was verified operable by performing a walkdown of the accessible and essential portions of the system on January 9, 1986.

Prior to the walkdown, Attachment 10.1 to Procedure OP-903-062, Revision 3, "Chilled Water System Valve Lineup Check Data Sheet," was compared with Drawing LOU-1564-G-853, Sheets 1 to 4, for accuracy. The checklist was utilized in performing the walkdown.

A number of comments were generated by the NRC inspectors during the checklist to drawing comparison and subsequent walkdown and forwarded to the licensee for action. None of these comments, which are summarized below, invalidated the checklist on system lineup:

- . Eighteen valves were observed to be inadequately tagged.
- . Nomenclature for a number of valves in the checklist and areas served was found to be incorrect.
- . CHW-506, AH 18A Outlet Valve, is listed correctly on the checklist valve tag and master valve list. However, it is incorrectly listed as CHW-505 on Drawing LOU-1564-G-853S06, Area F-8.
- . Chiller Suction Isolation Valves CHW-788A, CHW-788B, and CHW-788AB should be included in the checklist and verified open.
- . When Section C or D of the checklist is performed (Chiller AB replacing either A or B) it appears a section of piping between the chiller closed isolation valves is isolated without overpressure protection.

The assistant plant manager, operations and maintenance, and the operations superintendent stated that the above comments will be responded to both specifically and generically. They presently have in place a program to tag all plant valves with licensee assigned numbers. They will also assign individual shifts responsibility for review and update of each safety-related checklist. They agreed with the NRC inspectors that nomenclature errors in safety-related checklists cannot be tolerated and stated they would relay this policy to the personnel responsible for checklist review.

No violations or deviations were identified.

9. Routine Inspection

By observation during the inspection period, the NRC inspectors verified that the control room manning requirements were being met. In addition, the NRC inspectors observed shift turnover to verify that continuity of system status was maintained. The NRC inspectors periodically questioned shift personnel relative to their awareness of the plant conditions.

Through log review and plant tours, the NRC inspectors verified compliance with selected TS and limiting conditions for operations.

During the course of the inspection observations relative to protected and vital area security were made including access controls, boundary integrity, search, escort, and badging.

On a regular basis, radiation work permits (RWP) were reviewed and the specific work activity was monitored to assure the activities were being conducted per the RWPs. Selected radiation protection instruments were

periodically checked and equipment operability and calibration frequency were verified.

The NRC inspectors kept informed on a daily basis of overall status of plant and of any significant safety matter related to plant operations. Discussions were held with plant management and various members of the operations staff on a regular basis. Selected portions of operating logs and data sheets were reviewed daily.

The NRC inspectors conducted various plant tours and made frequent visits of the control room. Observations included: witnessing work activities in progress; verifying the status of operating and standby safety systems and equipment; confirming valve positions, instrument and recorder readings, annunciator alarms; and housekeeping.

During a check of equipment status in the control room, the NRC inspector reviewed the status of the containment hydrogen monitors and some of the procedures associated with them. NUREG 0737, II.F.1 required, in part, that containment hydrogen concentration information be available in the control room within 30 minutes following the initiation of safety injection. Section 6.2.5.2.1 of the W3 SES Final Safety Analysis Report (FSAR), which is also the licensee's response on NUREG 0737, II.F.1 for the hydrogen concentration monitoring capability, states that the system can be initiated within 30 minutes following a safety injection initiation. The NRC inspector found that neither procedural requirements or operator training require the monitor(s) to be in operation within the given time frame. Presently, the plant does operate with at least one monitor energized and isolated so that timely information could be obtained but this is a matter of preference and not a requirement. The licensee has stated that procedures will be changed to ensure at least one of the containment hydrogen analyzers is placed in operation as required by NUREG 0737.

The NRC inspectors found entries in the shift supervisor and reactor operator logs for the 0700-1500 shift on January 8, 1986, indicating that Control Element Assembly (CEA) 1 had dropped with the reactor at approximately 40% power. They indicated the breaker was found open. It was reclosed, the rod was recovered, and power ascension continued. No evidence of a formal evaluation of this incident could be found. When questioned, licensee management explained that an evaluation had been made by the assistant plant manager - operations and maintenance, operations superintendent, and maintenance superintendent, among others. However, it had not been documented. The plant manager stated that the evaluation should have been documented and committed to conducting an review to determine if there is a weakness in the licensee's event reporting and evaluation program. This an unresolved item 50-382/8602-01.

No violations or deviations were identified.

10. Startup Report Review

The NRC inspectors reviewed the W3 SES Startup Report dated October 10, 1985, for compliance with Section 6.9 of the W3 SES TS, the FSAR, and other licensee conditions and commitments. Questions and comments derived from this review were discussed with the licensee, who committed to make the following changes to the report by March 10, 1986:

- Add a section responsive to FSAR Section 14.2.12.3.16, "Chemistry."
- Revise Table 6.6.4.1 to reflect changes made by Combustion Engineering (CE) Letter C-CE-9535, dated October 4, 1985.
- Correct a number of errors in cross referencing which were discussed with the licensee.

This commitment will be tracked as open item 50-382/8602-02.

No violations or deviations were identified.

11. Followup on Potential Generic Problems

- a. Carbon Dioxide Introduction to Personnel Areas - The NRC inspectors were informed that this is not a credible event at W3 SES because there are no carbon dioxide discharge systems onsite.
- b. Steam Trap Failure in Emergency Feedwater (EFW) Steam Supply Line - The NRC inspector made report LER 85-25 from Palo Verde Nuclear Generating Station available to the licensee. It discussed an EFW pump turbine start failure caused by a failed steam trap.
- c. Reactor Trip Breaker (RTB) Test Failures - The NRC inspectors made the licensee aware that two of eight General Electric Type AK-2-25 RTBs did not function properly during surveillance testing on December 17, 1985, at Arkansas Nuclear One, Unit 2. They were subsequently successfully tested.

No violations or deviations were identified.

12. Inspection & Enforcement Bulletins

- (Closed) IEB 84-01 "Cracks in Boiling Water Reactor Mark I Containment Vent Headers" - Not applicable to this facility.
- (Closed) IEB 84-02 "Undervoltage Trip Attachments of Westinghouse DB-50 Type Reactor Trip Breakers" - Not applicable to this facility.

No violations or deviations were identified.

13. Allegation Followup

An inspection was performed by the NRC staff in response to allegation 4-85-A-001 concerning the seismic analysis and support of safety-related valve operators. Selected purchase specifications and documents, QC records, calculations, drawings, and other documents were examined.

a. Concern

Whether an exchange of loads occurred between the architect/engineer (A/E) and valve manufacturers after a pipe stress analysis was performed.

Finding

The design seismic loading conditions, under which all safety-related equipment must be able to function, are included in the purchase specifications. A pipe stress analysis is performed on a system to ensure the actual loads remain within these design parameters during a seismic event. If loads are determined to be outside the design limits, the support/restraint configuration is revised and an analysis is reperfomed. There is no reason or requirement to exchange loads as long as they are within the design conditions. Loads were transmitted in the purchasing documents for valves to be located in lines which had a high energy line break analysis performed, as these additional loads could possibly have an effect on the valve operator's ability to function during a seismic event.

b. Concern

Whether modeling valves as rigid members for analysis will result in loads which the valve operator cannot withstand.

Finding

The objective of seismic qualification is to ensure the equipment remains in the rigid range during a seismic event. The valve operators could be subject to excessive loads if they were not supported rigidly. The pipe support systems provide rigid mounting for all valves and their operators. External supports for valve operators were provided for all small bore (2" diameter) valve operators to reduce torsional loads on the pipe.

In summary, the inspection found that the safety-related valve operators reviewed were procured, analyzed, and supported properly. The allegor's concerns could not be substantiated.

No violations or deviations were identified.

14. Inoperable Containment Spray Pump

In LER 382/85-55 the licensee reported the failure to have Containment Spray Pump B operable as required by TS 3.6.2.1 and in this condition, having entered Mode 3 from Mode 4 in violation of TS 3.0.4.

The pump was inoperable because the discharge valve (CS-111B) had been left shut. Licensee operations personnel believed that they had opened and verified open the valve by use of the reach rod; however, the reach rod was disconnected so that the valve actually remained in the shut position when the operators manipulated the reach rod. LER 382/85-55 goes on to state that this problem was finally recognized when an operator noticed the discharge valve's "annunciator green light was illuminated indicating the valve as closed."

Review of this LER and the events described in it by the NRC inspector revealed a number of problems. First, the only indication of this valve's position available in the control room is a white alarmed annunciator (E-14 on the N annunciator panel) on which it is one of two valves in the header which will cause the alarm.

Second, the LER does not address the fact that this abnormal condition was recognized by the operators on the swing shift (1500-2300), but was attributed to additional problems with CS-117B (the second valve on the annunciator).

During the containment spray valve lineup, CS-117B was found to have a disconnected reach rod. When the annunciator did not clear after completion of the lineup, further problems with CS-117B were suspected but none were found. For a number of reasons CS-111B was not suspected as being the problem. Unlike CS-117B, CS-111B had an additional digital position indicator for number of turns open. Also, the operators did feel some resistance when positioning CS-111B, which they did not experience with CS-117B. Further, there was a problem with the annunciator response procedures for all the Column E annunciators on Panel N. These procedures were improperly titled as "F" rather than "E." So, when the control room operators looked for the response procedure for the alarm they may have assumed the procedure was missing from the file. Without the guidance of the procedure, a possible problem with CS-111B could have been overlooked. Such a scenario could explain why the operator in the Reactor Auxiliary Building was told to check CS-117B stem position three times. Not realizing, or forgetting, CS-111B also actuated the annunciator, the control room personnel could have felt CS-117B had to be the problem. The swing shift personnel finally attributed the alarming annunciator to a position indicator problem with CS-117B.

In addition to inspecting the valves and reach rods in question, the NRC inspector discussed this event with licensee operations and management personnel. Other questions that were not addressed in the report were raised. They included:

- a. How did the reach rods for the various valves become disconnected?
- b. If they were disconnected intentionally, why were no tags hung to alert the operators?
- c. Subsequent to the event it was discovered that some operations personnel knew the reach rods were disconnected. Why hadn't they ensured some corrective action was being taken?
- d. When the annunciator alarm was finally attributed to a position indicator problem, what corrective action was taken?

Sequence of Events

December 16, 1985

1341 - Secured shutdown cooling (containment spray required to be operable per TS 3.6.2.1).

1500 - Shift turnover. Swing shift operators have to position CS-111B and CS-117B to complete switchover to containment spray lineup.

1600 - Shift supervisor signed off completed containment spray lineup.

2042 - Entered Mode 3 from Mode 4.

2300 - Shift turnover.

December 17, 1985

0425 - Control room supervisor and shift technical advisor, having not received turnover on "position indicator" problem, question alarm on annunciator E-14 on N panel.

0453 - CS-111B opened and verified open at the valve.

The mode change from Mode 4 to Mode 3 with Containment Spray Pump B inoperable is an apparent violation of TS 3.0.4, which prohibits a mode change while relying on the action statement for TS 3.6.2.1, and is identified as 50-382/8602-03.

No additional violations or deviations were identified.

15. Exit Interview

The inspection scope and findings were summarized on January 31, 1986, with those persons indicated in paragraph 1 above. The licensee acknowledged the NRC inspectors findings. The licensee did not identify as proprietary any of the material provided to or reviewed by the NRC inspectors during this inspection.