APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-382/88-21 Operating License: NPF-38

Docket: 50-382

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

Facility Name: Waterford Steam Electric Station, Unit 3

Inspection At: Taft, Louisiana

Inspection Conducted: August 1 through September 16, 1988

Inspectors: W. F. Smith, Senior Resident Inspector — Date: 9/23/88

T. R. Staker, Resident Inspector — Date: 9-16-88

Approved: C. D. Chamberlain, Section Chief, Projects
Section A, Division of Reactor Projects — Date: 10-12-88

Inspection Summary

Inspection Conducted August 1 through September 16, 1988 (Report 50-382/88-21)

Areas Inspected: Routine, unannounced inspection consisting of: (1) plant status, (2) onsite followup of events, (3) followup of previously identified items, (4) operational safety verification, (5) monthly maintenance observation, (6) monthly surveillance observations, (7) licensee event report followup, and (8) engineered safety feature walkdown.

Results: In general, the licensee has shown significant improvement in the area of housekeeping and maintenance of equipment operability, particularly in radiation process monitors. Replacements and repairs made during the recent refueling outage combined with technician training appears to have improved plant reliability. In addition, the bimonthly ESF System Walkdown of the containment spray system was conducted with no deficiencies identified. This is the first time in over a year that there has been no deficiencies identified during an ESF system walkdown.

There are a number of examples in this report that reflect weaknesses in the licensee's corrective action program. The inspectors had discussions with plant management expressing concern over delays in taking prompt and effective actions to resolve safety related material or equipment problems which do not necessarily threaten a plant shutdown. It was recommended that the licensee review this potential area of weakness.

There was one violation identified in this report. The violation involved operation of the plant in Modes 1, 2, 3 and 4 without operable containment penetration backup overcurrent protection for pressurizer backup heater banks 3 and 4, a condition prohibited by technical specifications (Section 3.c).

One deviation was identified in Section 4d. The licensee failed to complete corrective action in response to a previous violation by the date committed to the NRC, and did not inform the NRC until a week after the date had passed.

A new unresolved item was identified in Section 6b, referring to the pending failure analysis of Dry Cooling Tower Fan 6A motor. This is a matter about which more information is required to ascertain whether it is an acceptable item, a deviation, or a violation.

DETAILS

1. Persons Contacted

Principal Licensee Employees

*R. P. Barkhurst, Vice President, Nuclear Operations
*N. S. Carns, Plant Manager, Nuclear
S. A. Alleman, Nuclear Quality Assurance Manager
P. V. Prasankumar, Assistant Plant Manager, Technical Support
D. P. Packer, Assistant Plant Manager, Operations and Maintenance
J. J. Zabritski, Operations Quality Assurance Manager
*D. E. Baker, Manager of Nuclear Operations Support and Assessments
J. R. McGaha, Manager of Nuclear Operations Engineering
W. T. Labonte, Radiation Protection Superintendent
G. M. Davis, Manager of Events Analysis Reporting & Responses
*L. W. Laughlin, Onsite Licensing Coordinator
D. W. Vinci, Maintenance Superintendent
A. F. Burski, Manager of Nuclear Safety and Regulatory Affairs
R. S. Starkey, Operations Superintendent
*C. R. Gaines, Events Analysis Supervisor

*Present at exit interview.

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. Plant Status (71707)

At the beginning of this inspection period on August 1, 1988, the plant was operating at full power. Due to continuing vibration problems with Main Feed Pump A after recovering from pump failure in July 1988 (See NRC Inspection Report 50-382/88-19, Section 10.a), it became necessary to reduce the flow through Feed Pump A to about 4000 gallons per minute less than Feed Pump B to reduce vibration to a more acceptable level. The pumps have been running in that flow configuration for the entire inspection period.

The plant was operated at full power until September 7, 1988, when power was reduced to just above 90 percent to eliminate a metallic knocking sound in No. 2 Steam Generator. This problem is discussed in detail in Section 3b below.

At the end of this reporting period, the plant was operating at 90 percent power, pending further investigation into the noise in No. 2 Steam Generator.

No violations or deviations were identified.

3. Onsite Followup of Events (93702)

a. Excessive Unidentified Reactor Coolant System Leakage

On Monday, August 15, 1988, the licensee conducted a Reactor Coolant System (RCS) water inventory balance pursuant to Technical Specification (TS) 4.4.5.2.1.d. The results were 1.34 gallons per minute (GPM) which exceeded the TS limit of 1.0 GPM for unidentified leakage. At 7:16 a.m., the licensee entered TS 3.4.5.2 action statement b which requires the excessive leakage to be corrected within 4 hours or be shut down from the current full power condition in the next 6 hours. The leak was found at the body to bonnet seal on RC-301A, the A Train pressurizer spray valve. The licensee applied a high pressure temporary seal to the valve, thus reducing RCS unidentified leakage to about 0.5 GPM. Discussion with the licensee revealed the fact that the operators had conducted the water inventory balance on Friday, August 12, 1988, and obtained a reading of 0.9 GPM. Senior plant management was not notified of this approaching limit, apparently because in the past it has not been unusual to see leakage rate in the range of 0.7 to 0.9 GPM for several days. The NRC inspectors expressed concern that when close to the limit, the licensee did not consider the potential of exceeding the TS limit by observing the RCS water inventory more frequently. Subsequently, the licensee made more frequent checks when appropriate.

On August 16, 1988, the temporary seal failed, and RCS unidentified leakage again increased to 1.26 GPM. The licensee quantified the leak rate by measuring condensed leakage from RC-301A, thus identifying the leakage and reducing the unidentified leak rate to less than 1.0 GPM. This allowed time to plan and complete the repair on RC-301A. By 1:58 p.m., RCS unidentified leakage was reduced to 0.84 GPM.

During the week of August 22, 1988, the licensee changed the technique used in applying the high pressure seal such that it would be less likely to fail. As a result, the leak rate from RC-301A was reduced to less than 0.01 GPM. The needed parts are available and the licensee has indicated that the valve will be repaired during the next shutdown and cooldown. Work associated with this leak has consumed approximately 10 Man Rem since the first indication of leakage on May 26, 1988, as the plant went into hot standby (Mode 3) from the second refueling outage. This represents about 5 percent of the total plant Man Rem expenditures to date.

b. Indeterminate Metallic Noise in Steam Generator No. 2

On August 30, 1988, an operator on rounds identified a metallic noise coming from the feed piping in the vicinity of the main feed isolation valve, on the +46 elevation. The plant was at full power. The loose parts monitor was not alarming. The inspectors heard the

noise, which sounded like a loose metal part in the flow stream, hitting against the piping or structure. The noise had no particular rhythm, and the pitch was about 2500 Hertz. By September 2, the licensee engaged a contractor, Technology for Energy Corporation (TEC), to locate and identify the noise. On September 3, the licensee reduced power below 90 percent for other reasons and found that the noise disappeared when operating at 90 percent or less. TEC initially located the noise 20 feet inside containment, near an elbow which turns the feed piping upward into an expansion loop.

During the next two weeks, the licensee obtained assistance from Combustion Engineering and, except when taking noise data, the plant was operated at 90 percent power to minimize possible damage. By September 15, the licensee had concluded that the noise was coming from Steam Generator No. 2. On September 15, the licensee informed the NRC that when the threat of Hurricane Gilbert passed and the grid became stable, the plant would be shut down and Steam Generator No. 2 instrumented to find the exact location of the noise. Corrective actions would be implemented as a function of the additional noise testing. The resident inspectors, NRR, and NRC Region IV will continue to monitor licensee actions on this matter.

c. Containment Penetration Backup Overcurrent Protection Inoperable

On August 1, 1988, the licensee issued Licensee Event Report 382/88-019 which described the discovery that backup overcurrent protection had not been provided for pressurizer heater backup banks (PHBs) 3 and 4 since initial startup. The inspectors conducted a review of the licensee's identification, reporting, and correction of the deficiency to determine whether or not the five criteria in 10 CFR 2 Appendix C were satisfied such that a Notice of Violation need not be issued by the NRC.

The inspectors noted that on May 21, 1988, while the plant was shut down for refueling, the licensee discovered that the output contacts of the PHB 3 and PHB 4 supply breaker transfer trip relays were reversed. As a result, the wrong feeder breaker would have been tripped should backup overcurrent protection be called upon for PHB 3 or PHB 4. The licensee failed to identify and formally report to the NRC that the plant had been operating in a condition prohibited by Technical Specification (TS) 3.8.4.1 since initial startup, until LER 382/88-019 was issued on August 1, 1988, over three months later. After correcting the wiring error, Work Authorization 01018451 required the trip transfer function to be retested per Procedure ME-07-300, Revision 0, "480 VAC Overcurrent Protective Device Functional Test," which was the procedure in use when the output contacts were found reversed on May 21, 1988. The step was signed off as completed with reference to the test results of ME-07-300. However, only the B train (PHB 4, 5, & 6) was tested. As a result, only half of the work done was retested. There was no

post-maintenance confirmation of Train A (PHB 1, 2, 3) operability prior to entering the plant operational modes for which the backup overcurrent protection was required. The licensee offered no explanation other than the scope of Work Authorization 01018451 did not include Train A. On May 25, 1988, the plant entered Mode 4. Train A was not tested satisfactorily until September 14, 1988. This additional period of time could have been prevented by proper retesting after the corrective maintenance.

Operating of the plant in a condition prohibited by TS is a violation of NRC regulations (382/8821-01).

There are issues not addressed in LER 382/88-019 that the licensee should discuss in the response to the Notice of Violation. First, what degree of confidence did the licensee have that other equipment presumed operable to satisfy the TSs on the basis of startup testing was in fact tested? Second, why was Train A transfer trip circuit not retested prior to declaring it operable after corrective maintenance on May 2 and what measures were taken to prevent similar problems in the future? Third, why wasn't the discovery of the reversed output contact on the PHB 3 and PHB 4 transfer trip relays reported within 30 days of May 21, 1988, as required by 10 CFR 50.73(a)(2)?

4. Followup of Previously Identified Items (92701)

a. (Closed) Open Item 382/8701-06: Issuance of an effluent monitoring program policy to satisfy compliance with Technical Specifications 6.8.1.k and 6.8.2. The NRC inspector verified that the licensee has approved and issued a program for effluent monitoring. The program is defined in Section IV, Chapter 2, of the licensee's Nuclear Operations Management Manual.

b. (Closed) Open Item 382/8731-01: Procedure changes to prevent painting in the control room envelope and other areas serviced by engineered safety features (ESF) filtration units during operation. The NRC inspector verified that precautions on painting during system operation have been added to ESF filtration unit operating and surveillance procedures.

c. (Open) Unresolved Item 382/8829-04: Determination of the causes for the delay in replacing and the safety significance of the undersized wiring for shield building ventilation system heaters. As documented in Condition Identification Work Authorization (CIWA) 016612 in March 1985, the licensee determined that the shield building ventilation system heater wiring was undersized and not in conformance with the National Electrical Code. The shield building ventilation train "B" heater wires were replaced in January 1986. The train "A" heaters were not replaced until July 1988, over three years after discovery of this condition. The licensee could not provide any documentation that supported the delay in correcting the identified deficiency.

After this issue was raised by the NRC inspectors, the licensee determined that these wires were not size 12 AWG as originally thought but were size 10 AWG. An analysis was then performed, and the licensee determined that these wires would meet operability requirements. The inspectors had discussions with licensee personnel knowledgeable of this problem. From these discussions and by review of documents presented, it appeared that the licensee was aware of the deficiency in March 1985 but apparently failed to replace the wiring until it became convenient to do so, without documented justification for operating the plant with a safety related system outside of its design basis. Since the technical specification surveillance requirements were met, there apparently was no sense of urgency to keep the system in its proper design configuration so that when called upon would not be subject to premature failure. The safety significance of this issue was mitigated by a subsequent analysis, but the licensee's corrective action programs appeared to be in need of review in the area of prompt identification and correction of conditions adverse to quality.

Failure to promptly correct the wiring deficiencies described above, or as an alternative, to document justification for continued plant operation with this condition would normally be cited as a violation of NRC regulations. However, recent enforcement action (EA 88-144) and proposed imposition of Civil Penalty for inadequate corrective actions is awaiting licensee response. This item will remain open pending licensee response to this previous corrective action violation.

d. (Open) Violation 382/8808-07: Failure to establish an adequate procedure to control the operation of the fuel handling building ventilation system. In the response to Violation Letter W3P88-1234, dated July 1, 1988, the licensee committed to review ESF ventilation system operating procedures by September 5, 1988. This action was completed on time. The licensee also committed to complete reviews of ventilation system and nonventilation ESF system documentation for root valve discrepancies by August 1, 1988. This was not completed by August 1, 1988. On August 9, 1988, the licensee informed the NRC by Letter W3P88-1262 that these two projects had been rescheduled for August 12, 1988, and November 30, 1988, respectively. Failure to inform the NRC of a change of commitment date was unacceptable. Failure to meet the date of August 1, 1988, is a deviation from commitment to the NRC (382/8821-03).

e. (Closed) NRC Bulletin 88-01: Defects in Westinghouse Circuit Breakers. The bulletin required addressees who do not have Westinghouse Series DS circuit breakers to provide a letter to the NRC stating this fact within 30 days upon receipt of the bulletin. The licensee responded by Letter W3P88-0051, dated March 29, 1988, that W3SES does not utilize Westinghouse Series DS circuit breakers and is therefore not subject to the inspections requested or the safety concerns of Bulletin 88-01. On September 9, 1988, NRR

acknowledged the letter and stated that the response above was satisfactory, and no further reply is necessary. This bulletin is closed.

5. Operational Safety Verification (71707, 71709 and 71881)

The objectives of this inspection were: (1) to ensure that this facility was being operated safely and in conformance with regulatory requirements, (2) to ensure that the licensee's management controls were effectively discharging the licensee's responsibilities for continued safe operation, (3) to assure that selected activities of the licensee's radiological protection programs were implemented in conformance with plant policies and procedures and in compliance with regulatory requirements, and (4) to inspect the licensee's compliance with the approved physical security plan.

During a routine tour of the Reactor Auxiliary Building, the inspector noted Fire Door 166 at the -35 feet elevation was jammed wide open. The bottom of the door interfered with the painted surface of the floor as the door position approached full open. There was no way of determining how many employees, if any, passed through the open fire door. Licensee efforts in response to Notice of Violation 382/8722-02, dated December 23, 1987, appeared to have been effective in preventing such unauthorized fire impairments. This may be an isolated case. The inspector closed the door and informed the Shift Supervisor so that the problem with the door could be corrected. On the next tour, the inspector found the door corrected and closed. No other unauthorized fire impairments were found during this inspection period.

On September 9, 1988, at 8:13 a.m., an unusual event was declared when a hurricane warning went into effect for the site and surrounding areas. While the NRC inspectors monitored the licensee's preparation for the storm, the NRC inspectors observed that Procedure OP-901-045, Revision 4, "Severe Weather and Flooding," required verification of the operability of the emergency diesel generators and diesel-driven fire pumps in accordance with their respective surveillance procedures. The Shift Supervisor on watch and Operations management interpreted this as a requirement to verify that surveillances for this equipment had been completed within the normal period. This was questionable to the inspectors because plant technical specifications required surveillances to be current during normal plant operations anyway. The NRC inspectors questioned this interpretation because the referenced procedures required the diesels to be run to confirm operability. Plant management later decided to start the diesels to verify operability but not complete the entire surveillance requirement per the monthly operability checks. The procedure was changed, and the diesels were run with no problems. Later that evening, hurricane Florence struck the Louisiana coast and passed near the site. Wind speeds measured at the site were in the 35-40 mph range.

During the week of September 12, 1988, Hurricane Gilbert entered the Gulf of Mexico as a Category 5 storm with 175 mph winds. The licensee

initiated planning for this severe storm by holding meetings with assigned Emergency Plan personnel. Due to the instability of other non-nuclear power plants, the licensee made plans to remain at power until winds capable of damaging the power distribution towers became eminent within 6 hours. The towers were subject to failure at a lower wind velocity than the power plant. As it turned out, the storm remained southward and had no significant effects on the plant other than some severe rains, which caused no damage.

The inspectors conducted tours of the plant when on site and found the licensee's housekeeping efforts to be excellent. The daily control room visits yielded satisfactory results. The operators appeared alert to their responsibilities, log keeping was adequate, and the number of lighted annunciators were few.

Fire impairments were being actively kept to a minimum. Flammables were apparently being properly stowed, as none were found in unauthorized areas.

There were no problems noted in the plant security area. All necessary stations appeared adequately manned, compensatory measures were properly taken where appropriate, and equipment at the primary access point was maintained operable.

No violations or deviations were identified.

6. Monthly Maintenance Observation (62703)

The below listed station maintenance activities affecting safety-related systems and components were observed and documentation reviewed to ascertain that the activities were conducted in accordance with approved procedures, technical specifications, and appropriate industry codes or standards.

a. Work Authorization 01021241. The NRC inspector observed the under voltage clearance, pickup, and dropout voltage and trip shaft torque measurements as performed per Procedure ME-04-155, Revision 7, "Reactor Trip Switchgear Breakers." The under voltage clearance, pickup voltage, and dropout voltages were out of tolerance but were adjusted to meet procedural requirements accordingly. Acceptable breaker opening time was measured and insulation testing was performed satisfactorily. A bracket mounting screw was not installed on the under voltage device. Work Authorization 01022870 was written, and a new screw was installed. The NRC inspector observed that procedures were adhered to, test equipment calibrations were current, and acceptance criteria were met.

b. Work Authorization 01023531. The inspector observed the electrical portions of replacement of the motor for Dry Cooling Tower Fan 6A. Similar work was observed on December 30, 1987, when the motor for Dry Cooling Tower Fan 4B was replaced. At that time, the inspector

noted discrepancies between the work done, the drawing, and the procedure. A Notice of Violation was issued (NRC Inspection Report item 50-382/8731-03) against the licensee's failure to comply with the drawing. In response, the licensee took exception to a violation of procedure, but the licensee did find a discrepancy between the drawing detail and the general notes and thus committed to review and clarify the sheets. On September 1, 1988, the inspector reviewed the documentation for the Fan 6A motor replacement. Drawing LOU-1564-B-288, Revision 3," Cable and Conduit List Installation Detail" had since been changed, as was Maintenance Procedure ME-04-809, Revision 4, "Low Voltage (600 Volts and Less) Power and Control Cable/Conductor Terminations and Splices." The drawing details and notes more clearly indicated what must be done, with one added exception. General Note 6A required application of nuclear splice cement on lugs, bolts, and metal parts in addition to the conductor insulation in "wet locations." The electrician decided, instead of receiving direction from the work authorization, that Fan 6A motor was in a wet location because he could not explain what the definition of "wet location" was. Even though the splices were sealed in a gasketed connection box, the motor was exposed to the elements. Section 8.5.2 of the procedure did not address application of cement in "wet locations," but it applied the cement to the insulation in a reversed sequence.

After observing the installation, the inspector concluded that the splice was performed in a correct manner and in accordance with the drawing. However, Procedure ME-04-809 was inadequate in that it had obsolete instructions in Section 8.5.2 which were superseded by the drawing. The licensee committed to correct the conflicts. The inspectors will document completion of this action when violation 382/8731-03 is closed.

The electricians noted that the motor had smaller gage motor leads than normally seen. The inspector requested the licensee to explain why the motor failed, because it appeared that the failure was related to the motor leads. As of the end of this inspection, the licensee had not yet performed a failure analysis, and as such, this issue will be tracked as an unresolved item (382/8821-04).

c. Work Authorization 01023887. The NRC inspector observed portions of the Containment Spray Pump "B" shaft seal packing replacement. The packing is a backup for the pump shaft mechanical seal. Component cooling water is supplied to a lantern ring between the first and second (three rings total) packing rings for lubrication. Several attempts were made to replace the packing. After the first attempt, when the pump was started for packing adjustment, smoke came from the packing. The pump was secured. During the second attempt, the mechanics could not fit the three packing rings into the stuffing box. After cleaning the stuffing box, the packing was replaced a third time and adjustments were made but component cooling water leakage through the packing could not be reduced to an acceptable

level. Approximately 4 gallons per hour of CCW was leaking out of the packing. This leakage could be reduced by throttling the CCW supply valve but because of uncertainties of the effect on the operability of the pump, the valve was left in the open position and the spray pump returned to operable status. Later the licensee determined that component cooling water was leaking from the spray pump packing through the mechanical seal into the pump at a rate of 1 gallon per minute. This leakage resulted in dilution of the borated water in the "B" train safety injection/containment spray suction piping. The boron concentration had decreased from about 1900 PPM to 1066 PPM in the containment spray pump suction. An analysis was performed to ensure that this dilution did not create an unreviewed safety question. The results indicated that it did not. The licensee also determined that the corrosion inhibitors in the component cooling water would not have an adverse effect on the containment spray or safety inspection system piping and components. The licensee contacted the pump seal vendor and determined that the CCW supply to the packing could be throttled to reduce the leakage without affecting pump operability. The CCW supply valve has since been temporarily throttled and leakage reduced. Followup on the licensee's permanent corrective actions on the shaft packing leakage problem are being tracked as an open item (382/8821-05).

No violations or deviations were identified.

7. Monthly Surveillance Observation (61726)

The NRC inspectors observed the below listed surveillance testing of safety-related systems and components to verify that the activities were being performed in accordance with the technical specifications. 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 inspectors ascertained that any deficiencies identified were properly reviewed and resolved.

a. Procedure OP-903-068, Revision 5, "Emergency Diesel Generator Operability Verification." On August 9, 1988, the NRC inspector witnessed the monthly operability run of Emergency Diesel Generator B. The NRC inspector observed that the diesel ran smoothly, and procedural and technical specification requirements were met.

b. Procedure OP-903-032, Revision 6, "Quarterly ISI Valve Tests." On August 9, 1988, the NRC inspector observed the operability verification of the emergency diesel generator fuel transfer pump "A" discharge check valve (EGF-109A). Valve operability was checked by verifying that the flow rate of greater than 30 GPM was obtained when transferring fuel to the feed tank with transfer pump B. No problems were noted.

No violations or deviations were identified.

8. Licensee Event Report (LER) Followup (90712)

The following LERs were reviewed and closed. The NRC inspectors verified that reporting requirements had been met, causes had been identified, corrective actions appeared appropriate, generic applicability had been considered, and that the LER forms were complete. The NRC inspectors confirmed that unreviewed safety questions and violations of technical specifications, license conditions, or other regulatory requirements had been adequately described.

(Closed) LER 382/85-034, "Automatic Actuation of Reactor Protective System Due to Feed Trip (Revision 1)."

(Closed) LER 382/86-024, "Inadvertent Discharge of a Boric Acid Condenser Tank due to Procedure Noncompliance."

(Closed) LER 382/87-023, "Invalid Condenser Vacuum Pump Samples Due to Loss of Demister Loop Seal."

(Closed) LER 382/87-025, "Missed Samples Due to Inadequate Administrative Controls."

No violations or deviations were identified.

9. Engineered Safety Feature (ESF) Walkdown (71710)

The NRC inspectors conducted a walkdown of the accessible portions of the containment spray system to verify system operability. The licensee's operating procedure and system drawing were reviewed and compared with the as-built configuration. Equipment condition, valve and breaker positions, housekeeping, labeling, permanent instrument indication, and apparent operability of support systems essential to activation of the ESF system were all noted as appropriate. The NRC inspectors found no significant problems that would preclude the system from performing its intended safety functions.

No violations or deviations were identified.

10. Exit Interview (30703)

The inspection scope and findings were summarized on September 23, 1988, 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.