APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-382/89-38 Operating License: NPF-38

Docket: 50-382

Licensee: Louisiana Power & Light Company (LP&L)
317 Baronne Street
New Orleans, Louisiana 70160

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

Inspection At: Taft, Louisiana

Inspection Conducted: November 1-30, 1989

Inspectors: W. F. Smith, Senior Resident Inspector
Project Section A, Division of Reactor Projects

C. C. Warren, Senior Resident Inspector (Backup)
Project Section A, Division of Reactor Projects

T. R. Staker, Resident Inspector
Project Section A, Division of Reactor Projects

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Project Section A, Division of Reactor Projects

Approved: Dwight D Chamberlain 12-15-89
D. D. Chamberlain, Chief, Project Section A Date

Inspection Summary

Inspection Conducted November 1-30, 1989 (Report 50-382/89-38)

Areas Inspected: Routine, unannounced inspection of plant status, onsite followup of events, monthly maintenance observation, monthly surveillance observation, operational safety verification, and followup.

Results: No violations or deviations were identified. The period covered by this inspection included the conclusion of the third refueling outage which lasted 58 days. The licensee's planning efforts and management involvement appeared to facilitate a smooth transition from cold shutdown after the refueling to full power operation.

One event during the startup was handled well by the licensee. Just prior to connecting to the power grid, Unit Auxiliary Transformer (UAT) 3B failed and caught fire. The licensee's actions to respond to the casualty, extinguish the fire, and recover from the failure were timely and appropriate. No plant transients were experienced, and the startup was resumed within a day with the UAT removed from service. This is discussed further in paragraph 3.b of this report.

DETAILS

1. Persons Contacted

Principal Licensee Employees

R. P. Barkhurst, Vice President, Nuclear Operations
*J. R. McGaha, Plant Manager, Nuclear
*P. V. Prasankumar, Assistant Plant Manager, Technical Support
*D. F. Packer, Assistant Plant Manager, Operations and Maintenance
*A. S. Lockhart, Quality Assurance Manager
*D. E. Baker, Manager of Nuclear Operations Support and Assessments
R. G. Azzarello, 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
T. R. Leonard, Maintenance Superintendent
R. F. Burski, Manager of Nuclear Safety and Regulatory Affairs
R. S. Starkey, Operations Superintendent
*W. E. Day, Trending, Compliance, and Response Supervisor

*Present at exit interview.

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

2. Plant Status (71707)

The plant was shut down and in Operational Mode 5 (Cold Shutdown) at the beginning of this inspection period with preparations under way to complete the third refueling outage. On November 17, 1989, initial criticality was achieved by boron dilution. On November 19, 1989, Operational Mode 1 (greater than 5 percent) was entered at 8:02 a.m. After recovering from the failure of Unit Auxiliary Transformer 3B, the plant was connected to the grid at 5:36 a.m., on November 20, 1989. As of the end of this inspection period, the plant was operating at full power.

3. Onsite Followup of Events (93702)

a. Crack Found in Reactor Coolant Pump 1A Skirt

On November 5, 1989, during the routine 10-year Inservice Inspection (ISI) of Reactor Coolant Pump (RCP) 1A to foundation skirt weld, the licensee identified a linear dye penetrant indication about 1-inch long. The defect was in the heat affected zone just above the weld but about 3 inches below the pressure boundary (pump volute). After grinding into the defect 1 1/2 inches, the defect lengthened to almost 2 inches but did not appear to be wider, based on the

intensity of the indication. The licensee ground to 2 inches deep when the defect was removed. The skirt was 3 inches thick. The licensee then welded up the excavation and radiographed the weld. The RCP 2A foundation skirt was inspected as required by the ASME Code, and no defects were found.

b. Failure of Unit Auxiliary Transformer (UAT) 3B

On November 19, 1989, at about 2 p.m., UAT 3B faulted at the secondary 6,900 volt connections and the secondary cables caught fire. The plant was in the process of starting up from the third refueling outage and was at 10 percent power. Main generator voltage had been on the primary side of the transformer for approximately 30 minutes for the first time since the beginning of the 2-month outage. The fault tripped the main generator exciter breaker, de-energized the primary side of the UAT, and locked out the main output breakers. All site electrical loads were still being supplied power from the startup transformers from off-site, so no transients were seen on the safety-related buses. The UAT fire suppression deluge system did not extinguish the intense fire until the onsite fire brigade soaked it down using fire hoses. Local fire department assistance was requested, so at 2:07 p.m. an unusual event was declared per the licensee's emergency plan. The fire was extinguished by 2:17 p.m. before outside assistance arrived. The unusual event was terminated at 2:50 p.m. The resident inspectors were on site at the time of the incident and observed the fire and the licensee's response. The licensee's actions appeared adequate and timely. The licensee disconnected the primary side of the UAT by removing the disconnect links and implemented a temporary alteration to disconnect the appropriate interlocks and indication circuits so that the startup could be resumed without the UAT in service. A 10 CFR 50.59 evaluation was performed and the temporary alteration was approved by the Plant Operations Review Committee. The licensee inspected UAT 3A to preclude a similar failure and, by 6:46 a.m. on November 20, 1989, the plant was connected to the grid. Based on long lead times on needed replacement parts, it appeared that UAT 3B would not be repaired until about June 1990. Meanwhile, the licensee will be operating at full power with B Train power being supplied from Startup Transformer B and A Train power from UAT 3A.

Upon reviewing the power lineup discussed in the FSAR and discussing the fact that UATs are used more for economic purposes than reliability, the inspectors noted that the plant was in at least as reliable a lineup from a safety standpoint as it would be with both UATs in service. For example, in the event of a turbine-generator trip, B vital power would already be from the startup transformer, which is the preferred power source. The UATs at Waterford 3 were manufactured by Federal Pacific, which has since been purchased by North American Transformers of California.

c. Error Found in Mass Flowrate Uncertainties

On November 30, 1989, the licensee informed the inspectors that uncertainties associated with the Core Operating Limit Supervisory System (COLSS) reactor coolant system (RCS) mass flowrate value had been revised from 4.4 percent to 5.1 percent following the third refueling outage. This was reportedly revealed out of discussions between the licensee and Combustion Engineering. Technical Specifications (TS) required the actual RCS total flowrate to be at least 148 million pounds per hour while in Mode 1. There was a surveillance requirement to determine that the limit was being met every 12 hours. The licensee made this determination every 8 hours, with an as-read acceptance limit of 154.512 million pounds per hour, including uncertainties. Based on the revised value, the limit should have been 155.548. Typically, the RCS flowrate has been greater than 161 million pounds per hour, which was well above the revised limit, thus there was no safety significance to this problem for Waterford 3 at this time. The licensee promptly revised the acceptance value in the TS surveillance log and is investigating the causes and generic implications of this problem. The inspectors will follow up on the licensee actions to resolve this issue (Inspector Followup Item 382/8938-01).

d. Fire Seal Inspection and Repair Program

The licensee's efforts to identify and correct all fire seal deficiencies at Waterford 3 have been documented in NRC Inspection Reports 50-382/88-28, -88-31, -89-03, -89-06, -89-08, -89-12, -89-17, and -89-23. In addition, the licensee reported the problems in LER 382/88-030, dated December 12, 1988. The licensee has issued updated revisions to the LER on May 30 and July 14, 1989.

On November 28, 1989, the licensee provided a detailed update on the progress made in this program. During the third refueling outage, much of the fire seal rework was completed. Upon startup, there was a significant reduction in scaffolding noted by the inspectors. There were still about 104 impairments against fire rated assemblies such as fire wrap, fire seals, fire dampers, and walls and floors. Some of these impairments each involved several specific wraps, seals, or dampers. Fire watches remained in effect while these impairments existed. Roughly 100 additional condition reports exist requiring dispositioning by engineering, after which the licensee will be in a position to schedule completion of the project. The program has continued to be both thorough and conservative, with a goal to have all fire rated assemblies in a correct configuration. The inspectors will continue to follow the program and report progress, and the licensee has committed to update LER 382/88-030 when appropriate.

4. Monthly Maintenance Observation (62703)

The station maintenance activities affecting safety-related systems and components per the below listed work authorizations (WAs) were observed and documentation reviewed to ascertain that the activities were conducted in accordance with approved procedures, TS, and appropriate industry codes or standards.

a. WA 01049250. On November 21, 1989, the inspector observed the preventive maintenance performed on a temperature switch on the A/B Essential Chiller. The inspector reviewed the work package, meter and test equipment used, and the data taken. No problems were identified.

b. WA 01050014. On November 30, 1989, the inspector observed the High Efficiency Carbon Absorber (HECA) filter unit draining process in accordance with Maintenance Procedure MM-6-016, Revision 3, "HECA Absorber Filter Unit Fill and Drain." This was accomplished on the Shield Building Ventilation System Emergency Filtration Unit B. There were no problems identified, however, Step 8.2.19.2 of MM-6-016 required the maintenance technicians to shake the filter bags each time after having filled 5 drums. This was to prevent the bags from becoming clogged with dust, which could inhibit proper draining. The inspector noted that the licensee used large rectangular receptacles instead of drums. The maintenance technician used good judgement in periodically shaking the filter bags, however, the procedure was not written to support this. The licensee committed to correct the procedure to reflect the use of the large receptacles. This action is deemed appropriate to address this matter.

5. Monthly Surveillance Observation (61726)

The inspectors observed the surveillance testing of safety-related systems and components listed below to verify that the activities were being performed in accordance with the TS. 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 NE-002-020, Revision 2, "CEA (Control Element Assembly) Insertion Time Measurement." On November 16, 1989, the inspector observed the performance of NE-002-020, which was being performed as part of startup testing after completion of the current refueling outage. The test was performed to satisfy the surveillance requirements of TS 3.1.3.4, "CEA Drop Time," and 3.1.3.2, "(CEA)Position Indicator Channels." The inspector verified that the test was being performed by qualified personnel in accordance with approved procedures. The procedure was reviewed and discussed with the test director. Prerequisites and initial conditions appeared to be satisfied and were signed off in the procedure. The inspector

witnessed withdrawal of the CEA's in accordance with OP-004-004, "Control Element Drive," and performance of inverse count rate ratio determination at specified intervals of rod withdrawal. All CEA's were dropped simultaneously and timed using special test software loaded into the CEA Calculator. The inspector reviewed the printout of the CEA Calculator test software and determined that all CEA's met the required TS drop time of less than or equal to 3.2 seconds. No problems were identified.

b. Procedure OP-903-008, Revision 2, "Reactor Coolant System (RCS) Isolation Leakage Test." On November 16, 1989, the inspector observed a portion of OP-903-008, which was being performed to satisfy the requirements of TS 3.4.5.2, "RCS Operational Leakage." The inspector verified that the test was being performed by qualified personnel in accordance with approved procedures. The procedure, system diagram, and test setup were reviewed and discussed with the Senior Reactor Operator performing the test. The valves being tested were SI-142A, a low pressure safety injection check valve, and SI-330B, a safety injection tank 2B check valve. Both valves indicated zero leakage. Results for the remainder of the valves previously tested were reviewed, and all appeared to satisfy the surveillance requirements. No problems were identified.

c. Procedure ME-3-220, Revision 6, "Station Battery Bank and Charger (18-Month)." On November 30, 1989, the inspector observed conduct of the charger capacity performance test on Battery Charger 3A1-S. The inspector also reviewed the procedure and the data entered by the maintenance technician. No problems were identified.

6. Operational Safety Verification (71707)

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

The inspectors conducted control room observations and plant inspection tours and reviewed logs and licensee documentation of equipment problems. Through in-plant observations and attendance of the licensee's plan-of-the-day meetings, the inspectors maintained cognizance over plant status and TS action statements in effect.

During the reporting period, the inspectors monitored the heatup and startup of the unit in accordance with OP-010-001, "General Plant Operations." The procedure was reviewed and selected conditions and steps were observed and verified to be signed off by operations personnel. Mode

change checklists were reviewed and selected surveillance procedures required to be completed prior to changing modes were reviewed. The following surveillance procedure results were reviewed and found to be satisfactory:

a. OP-903-027 "Inspection of Containment."

b. OP-903-031 "Containment Integrity Check."

c. OP-903-040 "Containment Isolation Actuation Signal Test."

d. OP-903-067 "Unit Power Supply Transfer Check."

e. OP-903-075 "Containment Purge Valve Isolation System Operability Check."

f. OP-903-091 "Recirculation Actuation Signal Test."

After the unit entered Mode 4, the inspectors performed an inspection tour of the reactor containment building. The inspectors toured all accessible areas of the containment, including the Reactor Coolant Pump 1B enclosure. The safety injection system recirculation sump inlet screen was observed to be clear of any debris that could block flow to the emergency core cooling system pumps. A few items such as radiation barriers and signs, yellow poly, and several bags of anti-contamination material associated with work in progress were noted by the inspectors and a reactor operator who was present. The items were brought to the attention of a shift supervisor who stated that several more inspections of the containment would be performed prior to unit startup to ensure that all such material was removed when work was completed. No problems with licensee actions in this area were noted.

7. Followup (92701)

The inspectors received a request from the Region IV staff to identify what types of primary and secondary safety relief valves are installed at Waterford 3 and how they are tested. The following information was determined during this followup.

The two reactor coolant system (primary) pressurized code safety relief valves were manufactured by Consolidated Valve Corporation of Dresser Industries. The two steam generators (secondary) each have six-code safety reliefs installed on the main steam lines outside the containment, manufactured by Crosby Valve Division of Geosource, Incorporated. None of these safety reliefs utilize a loop seal.

The primary safety reliefs are typically removed from the unit and sent offsite to Wyle Laboratories for testing; however, the secondary safety reliefs are tested on line, while the plant is at power, using hydraulic ("Trevitest") assist equipment. Licensee maintenance and operations personnel perform the test with assistance from the Furmanite Corporation.

8. Exit Interview

The inspection scope and findings were summarized on December 5, 1989, with those persons indicated in paragraph 1 above. The licensee acknowledged the inspectors' findings. The licensee did not identify as proprietary any of the material provided to, or reviewed by, the inspectors during this inspection.