

APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-382/88-17

Operating License: NPF-38

Docket: 50-382

Licensee: Louisiana Power & Light Company (LP&L)
N-80
317 Baronne Street
New Orleans, Louisiana 70160

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

Inspection At: W3, Taft, Louisiana

Inspection Conducted: May 31 through June 3, 1988

Inspectors:

H. C. Seidle for
T. O. McKernon, Reactor Inspector, Test
Programs Section, Division of Reactor Safety

6/14/88
Date

H. C. Seidle for
H. F. Bundy, Reactor Inspector, Test Programs
Section, Division of Reactor Safety

6/14/88
Date

Other
Accompanying
Personnel:

J. P. Clausner, French Commissariat a L'Energie
Atomique, Institut de Protection et de Surete
Nucleaire

Approved:

H. C. Seidle
W. C. Seidle, Chief, Test Programs Section
Division of Reactor Safety

6/14/88
Date

Inspection Summary

Inspection Conducted May 31 through June 3, 1988 (Report 50-382/88-17)

Areas Inspected: Routine, unannounced inspection of the licensee's startup testing.

Results: The licensee's startup testing following the Cycle 2 refueling outage appeared to generally be in conformance with NRC requirements and licensee procedures. One violation is identified in paragraph 2.e. No deviations were identified.

DETAILS

1. Persons Contacted

LP&L

- R. Barkhurst, Vice President, Nuclear/Site Director
- *N. Carns, Plant Manager
- *P. Prasankumar, Assistant Plant Manager
- *S. Alleman, Quality Assurance (QA) Manager
- *T. Smith, Plant Engineering Superintendent
- *R. Brian, Lead Startup Engineer, Plant Engineering
- P. Melancon, Senior Engineer, Reactor Engineering and Performance

NRC

- W. Smith, Senior Resident Inspector
- *T. Staker, Resident Inspector

The NRC inspectors also interviewed other licensee personnel during the inspection.

*Denotes those attending the exit interview on June 3, 1988.

2. Startup Testing (72700)

The purpose of this inspection was to verify that startup testing following the Cycle 2 refueling outage (beginning of Cycle 3) was in accordance with NRC requirements and licensee procedures. In conjunction with this, it was verified that results met acceptance criteria, and deficiencies were resolved in a timely manner. Pursuant to these objectives, the NRC inspectors reviewed the following licensee startup administrative procedures and witnessed selected data collection and recording up to 60 percent full power (FP):

- NE-2-100, Revision 1, "Startup Testing Procedure Fast Power Ascension Data Collection and Analysis," dated May 27, 1988
- NE-2-003, Revision 1, "Startup Testing Procedure Post-Refueling Startup Testing Controlling Document," dated May 27, 1988

The above procedures assured timely data collection and analysis to verify subsequent reactor operation within predicted core physics parameters. In addition to specific reactor physics tests discussed in detail below, the NRC inspectors reviewed data for the following measurements/tests:

- Initial Criticality (NE-2-030)
- Base Power Level Determination for Performance of Low Power Physics Testing (NE-2-003)

o Control Element Assembly (CEA) Coupling Checks (NE-2-003)

a. Surveillance of Core Power Distribution Limits (61702)

The purpose of this part of the inspection was to verify that appropriate core power distribution limits had been established and that core physics tests predicted and/or verified operation within these limits. Pursuant to these objectives, the NRC inspectors reviewed the following procedures and data:

- o NE-2-110, Revision 0, "Fuel Symmetry Verification"
- o INCA, Various Computer Incore Symmetry Reports

The above data appeared to be within predicted values. However, because the plant did not achieve the 68 percent FP plateau during the inspection, the NRC inspectors were unable to review performance of licensee Procedure NE-2-140, "Core Power Distribution."

b. Calibration of Nuclear Instrumentation Systems (61705)

During this portion of the inspection, the NRC inspector reviewed the licensee's procedures for comparing incore/excore linearity and verified that the plant was operated within the Technical Specifications (TS) tolerances allowed for the axial shape index (ASI). The NRC inspector reviewed the following procedures and test results:

- o NE-2-010, Revision 1, "Linear Power Subchannel Adjustment," dated March 31, 1988.
- o NE-2-110, Revision 1, "Fuel Symmetry," dated May 27, 1988.

The licensee's procedures were found to be acceptable and test results were within the procedural acceptance criteria. Calibrations and tests were performed in accordance with those frequencies stated in the TS.

c. Core Thermal Power Evaluation (61706)

During this portion of the inspection, the NRC inspector verified that calculation of core thermal power at the 20 percent FP plateau was correct and that the procedure used was technically adequate. The NRC inspector reviewed a record of completion of licensee Procedure NE-2-120, Revision 0, "Startup Test Procedure Nuclear and Thermal Power Calibration," dated June 1, 1988. It required calibration of Plant Protection System (PPS) linear power, core protection calculator (CPC), nuclear (PHICAL) and thermal (BDT) power indications to agree within ± 2 percent RATED THERMAL POWER with a core operating limits supervisory system (COLSS) secondary calorimetric. All as-left data satisfied acceptance criteria.

The NRC inspector also reviewed a sample of records of completion of Procedure OP-903-001, Revision 9, "TS Specification Surveillance Log," Attachment 10.1, page 21 of 35. These were records of daily calorimetries for several weeks prior to the refueling outage. In all instances where acceptance criteria were not satisfied, appropriate adjustments were made per the referenced procedure.

d. Determination of Reactor Shutdown Margin (61707)

During this portion of the inspection, the NRC inspector determined that the licensee is ensuring adequate shutdown margin during the operating cycle. The NRC inspector reviewed the following surveillance procedure:

- ° NE-4-007, Revision 0, "Shutdown Margin at the Transient Insert Limits," dated January 28, 1987

The NRC inspector verified that determination of reactivity contributions to the total core reactivity change were correctly performed for boron concentration, full length control rod bank worth changes as a result of position and boration, shutdown bank rods, part length rods, temperature, power level, and xenon concentration. Furthermore, the results of the shutdown margin calculation met the requirements of the TS and changes in boron concentration were verified by chemical analysis.

e. Isothermal Temperature Coefficient Measurement (61708)

The NRC inspector reviewed and verified the Startup Procedure NE-2-060, "Isothermal Temperature Coefficient Measurements," performed on May 30 and 31, 1988.

By reviewing the data collection and calculational test reports, the NRC inspector ascertained that the procedure met the test requirements and the acceptance criteria.

The purpose of this procedure was to measure the isothermal temperature coefficient (ITC) and determine the corresponding moderator temperature coefficient (MTC). By performing this test in the all rods out configuration, TS 4.1.1.3.2a was also satisfied.

The NRC inspector ensured that the ITC and MTC were calculated correctly and within the limits established in the TS and the Updated Final Safety Analysis Report.

During performance of this procedure with the reference group inserted, the NRC inspector noticed that the instruction 6.2 of the procedure had not been followed.

This instruction called for the RCS temperature to be decreased 5° to 10°F at a rate less than 50°F/hour. As a matter of fact, cooldowns were successively conducted at:

First cooldown - 3.9°F
Second cooldown - 2.8°F
Third cooldown - 2.0°F

It appeared the chart showing a slope trace after each cooldown contained sufficient data to determine ITC; however, the change to the test procedure was made without an approved procedure change. Paragraph 6.8.2 of the TS requires that each procedure of TS 6.8.1, and changes thereto, shall be reviewed and approved by the Plant Manager-Nuclear prior to implementation. The failure to follow the instruction, as discussed above, constitutes an apparent violation of TS 6.8.2. (382/8817-01)

f. Control Rod Worth Measurements (61710)

During this portion of the inspection, the NRC inspector verified that the licensee's procedure for Control Rod (Control Element Assemblies (CEAs)) Worth measurements was satisfactory and that test results were within TS limitations. The NRC inspector reviewed the following procedure and results:

- ° NE-2-040, Revision 1, "CEA Group Worth Measurement," dated May 27, 1988

The NRC inspector verified the following attributes:

- ° The procedural prerequisites and initial conditions were met.
- ° Those precautions delineated in the procedure were observed.
- ° Plant conditions during the test corresponded to those required by the procedure.
- ° Values obtained for control rod worths were within the acceptance criteria.
- ° The licensee performed the required boron concentration samplings of the Reactor Coolant System and pressurizer during the test.

g. Critical Boron Concentration Verification (72700)

The NRC inspector reviewed and verified the results for Startup Test Procedure NE-2-050, "Critical Boron Concentration Verification," performed on May 29 and 30, 1988. The purpose of this procedure was

(1) to determine the critical boron concentration (CBC) for various CEA configurations and (2) to determine the inverse boron worth (IBW).

The CBC was measured for the reference group "B" inserted and in the All Rods Out configurations. The inverse boron worth was also calculated for the "B" rodded configuration.

The NRC inspector found that the test results met the acceptance criteria and that the test was satisfactory.

Within the scope of this inspection, one apparent violation is discussed in paragraph 2.e. above. No deviations were identified.

3. Exit Interview

The NRC inspectors met with licensee representatives denoted in paragraph 1 on June 3, 1988, and summarized the scope and findings of this inspection. Mr. H. Bundy contacted Mr. P. Prasankumar, Plant Assistant Manager, on June 9, 1988, and informed him that the failure to follow the procedure for calculating the isothermal temperature coefficient discussed in paragraph 2.e. above had been determined to be an apparent violation. The NRC inspectors had not identified it as an apparent violation at the exit meeting. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.