APPENDIX A

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report No. 50-382/92-11

Operating License No. NPF-38

Licensee: Entergy Operations, Inc.
P.O. Box B
Killona, Louisiana 70066

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

Inspection at: W3 Taft, Louisiana

Inspection Conducted: May 3-8, 1992

Inspectors: D. L. Kelley, Reactor Inspector, Test Programs Section
Division of Reactor Safety, Region IV

M. E. Murphy, Reactor Inspector, Test Programs Section
Division of Reactor Safety, Region IV

Approved: _____ 5/27/92
J. E. Gagliardo, Chief, Test Programs Section, Division of Reactor Safety — Date

Inspection Summary

Inspection Conducted May 4-8, 1992 (Report 50-382/92-11)

Areas Inspected: Routine, announced inspection of the licensee's surveillance testing and calibration control programs and Cycle 5 post-core-load physics testing.

Results: Within the areas inspected, no violations or deviations were identified. The surveillance testing and calibration control program were well documented, controlled, and effectively implemented. The Cycle 5 post-core-load physics tests verified the predicted core reload analysis data.

DETAILS

1. PERSONS CONTACTED

ENTERGY

*C. Alday, Reactor Engineering and Performance
*W. Brian, Plant Engineering Superintendent
*R. Burski, Director, Nuclear Safety
*T. Gates, Licensing Engineer
*T. Gaudet, Operational Licensing Supervisor
*T. Leonard, Technical Services Manager
*D. Packer, General Manager, Plant Operations
*P. Prasankumar, Principle Engineer
*D. Shipman, Planning and Scheduling, Plant Operations
*J. Zabritski, Quality Assurance Manager (Acting)

NRC

*W. F. Smith, Senior Resident Inspector
*E. Lea, Reactor Engineer

The inspectors also contacted other licensee personnel during the inspection.

*Denotes those attending the exit meeting on May 8, 1992.

2. SURVEILLANCE TESTING AND CALIBRATION CONTROL PROGRAM (61725)

The purpose of this portion of the inspection was to ensure that the licensee had developed and implemented the surveillance testing and calibration control program at W3 as required by Technical Specifications.

The inspectors concluded that the licensee's program was effectively implemented and contained sufficient controls to identify, schedule, and track individual surveillance tests and calibrations. There were no Technical Specification surveillance testing requirement changes identified in the last three Technical Specification amendments.

The inspectors reviewed the licensee's controlling procedures and interviewed the personnel responsible for the implementation of the programs. The licensee's surveillance testing program was controlled and defined by Procedure UNT-007-042, Revision 7, "Technical Specification Surveillance Control." The calibration program was defined and controlled by Procedure UNT-005-012, Revision 1, "Repetitive Task Identification." Both programs utilize the Station Information Management System (SIMS) database information for component identification. The database components requiring surveillance testing or calibration are coded and sort programs were used to generate dated schedules for test or calibration performance.

The inspectors interviewed personnel who were responsible for the performance and tracking of these programs. The personnel interviewed were very knowledgeable of the workings of their respective programs. The inspectors discussed the methods used to generate the dated testing or calibration lists, how the schedulers and planners utilized the list, how the computer generated the lists for tracking, and the process for review and closeout of completed surveillance tests and calibrations. The methodology, control, and attention to detail appeared to be effective as evidenced by the fact that there had been no missed surveillance test or calibrations during the past 12 months.

3. STARTUP TESTING - REFUELING CYCLE 5

This portion of the inspection involved the review of the data from selected startup and core physics tests associated with the Cycle 5 refueling at W3. This review was conducted by the inspectors to verify compliance with NRC requirements and the licensee's procedures.

The inspectors reviewed procedures and test data in the following areas:

- Rod drive and rod position indication checks (72700);
- Surveillance of core power distribution limits (61702);
- Calibration of nuclear instrumentation systems (61705);
- Core thermal power evaluation (61706);
- Determination of reactor shutdown margin (61707);
- Isothermal and moderator temperature coefficient determinations (61708);
- Total power coefficient of reactivity (61709); and
- Control rod worth measurements (61710).

Results of the review in each area are discussed in the following paragraphs.

3.1 Rod Drive and Rod Position Indication Checks (72700)

The purpose of this review was to confirm that control element assembly (CEA) insertion times were measured and that cross checks of the CEA position indication systems were made in accordance with Technical Specification requirements. The inspectors reviewed completed Startup Test Procedure NE-002-020, Revision 3, "CEA Insertion Time Measurement." The test results satisfied all of the acceptance criteria.

3.2 Surveillance of Core Power Distribution Limits (61702)

The purpose of this review was to confirm that the core analysis code contained the correct analytical constants and that the test data compared favorably with the vendor core power distribution limits predicted values.

The inspectors reviewed the licensee's completed Startup Test Procedure NE-002-140, "Core Power Distribution." The inspectors determined that the correct analytical code had been used and the results satisfied all of the acceptance criteria.

3.3 Calibration of Nuclear Instrumentation (NI) Systems (61705)

The purpose of this portion of the inspection was to verify that incore and excore nuclear instrumentation calibration was performed and that the excore safety channels were appropriately adjusted. Pursuant to these objectives, the inspectors reviewed the following completed test procedures:

- Startup Test Procedure NE-002-010, Revision 1, "Linear Power Subchannel Adjustment;" and

- Surveillance Procedure MI-003-101, Revision 1, "NI Linear Power Channel Calibration Safety Channel A__ B__ C__ ."

The inspectors determined that the requ[illegible]ata had been documented and the new linear current values had been establ[illegible]ed as appropriate.

The startup and control channel drawers were properly calibrated and the operation of power supplies, log count rate circuitry, and linear power circuitry were tested in accordance wi[illegible]rveillance Procedure MI-003-115, Revision 1, "Startup and Control Chan[illegible]l Drawer Calibration Channe[illegible] 1 or 2." The acceptance criteria were satisfied by the test results.

3.4 Core Thermal Power Evaluation (61706)

The p[illegible]ose of this portion of the inspection was to determine that the core thermal power was correctly established by calorimetric calculations at the required intervals during the startup. Pursuant to this objective, the inspectors reviewed the following completed test procedures:

- Startup Test Procedure NE-002-120, Revision 1, "Nuclear and Thermal Power Calibration";

- Surveillance Procedure NE-4-006, Revision 3, "RCS Flow Rate Calculation with COLSS Operable"; and

- Startup Test Procedure NE-002-100, Revision 12, "Fast Power Ascension Data Collection Analysis."

The inspectors determined that the core thermal power had been established at appropriate intervals during the startup. Also, reactor power level and flow instrumentation had been adjusted to provide conservative supervisory controls and inputs to the plant protection system.

3.5 Determination of Reactor Shutdown Margin (61707)

The purpose of this portion of the inspection was to determine that adequate reactor shutdown margin had been established prior to operation above 5 percent of rated thermal power. The review of completed Surveillance Procedure NE-4-007, Revision 0, "Shutdown Margin at the Transient Insert

Limits," indicated satisfactory establishment of this margin. Calculations indicated an available 5.75 percent delta K/K reactivity shutdown margin versus an acceptance criteria of 5.15 percent delta K/K.

3.6 Isothermal and Moderator Temperature Coefficient Determination (61708)

The purpose of this portion of the inspection was to ensure that the moderator temperature coefficient (MTC) was calculated correctly and was within the limits established in the Technical Specifications and the limits predicted by the fuel vendor. The inspector reviewed completed Startup Tests NE-002-060, "Isothermal Temperature Coefficient Measurement," and NE-002-002, "Variable Tavg Test" (MTC at >15 percent rated power prior to exceeding 40 effective full power days).

The inspector verified that the MTC was in agreement with the Technical Specification limits and the fuel vendor prediction.

3.7 Total Power Coefficient of Reactivity (61709)

The total power coefficient of reactivity is typically not measured following core reloads at pressurized water reactors unless the core reload departs markedly from typical fuel and poison loadings. The licensee has not been required to determine total power coefficient of reactivity since initial startup.

3.8 Control Rod Worth Measurements (61710)

The purpose of this portion of the inspection was to verify that control rod worth measurement procedures follow the licensee's commitments for the Cycle 5 core reload analysis report.

The inspectors reviewed licensee Startup Test Procedure NE-002-040, Revision 2, "CEA Group Worth Measurement." Control element assembly group worth measurements were performed utilizing the rod group exchange technique in accordance with the procedure and included determination of reference group worths by boration-dilution. The inspectors verified portions of the results by independent data reduction and evaluation. Collection and reduction of data conformed to the procedural requirements.

4. EXIT MEETING

An exit meeting was conducted with licensee personnel identified in paragraph 1 on May 8, 1992. During the meeting, the inspectors reviewed the scope and findings of the inspection. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.