



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-335/84-14 and 50-389/84-16

Licensee: Florida Power and Light Company
9250 West Flagler Street
Miami, FL 33101

Docket Nos.: 50-335 and 50-389

License No.: DPR-67 and NPF-16

Facility Name: St. Lucie

Inspection at St. Lucie site near Jensen Beach, Florida

Inspector: *C. A. Taylor*
for K. E. Davenport

5/16/84
Date Signed

Approved by: *C. A. Taylor*
for F. Jape, Section Chief
Engineering Branch
Division of Reactor Safety

5/16/84
Date Signed

SUMMARY

Inspection on April 18 - 19 and April 24 - 30, 1984

Areas Inspected

This routine, unannounced inspection involved 47 inspector-hours on site in the areas of primary system valve leak check, rod drop time testing, initial criticality, zero power physics testing, and control room tours.

Results

Of the five areas inspected, no violations or deviations were identified.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *C. M. Wethy, Plant Manager
- *J. A. Boysinger, QA Engineer
- *J. J. Walls, QC Engineer
- *C. A. Pell, Reactor Engineering Supervisor
- M. S. Dryden, Plant Engineer II
- E. J. Wunderlich, Plant Engineer I
- J. L. Langford, Associate Plant Engineer

Other licensee employees contacted included two technicians and two operators.

Other Organization

K. A. Bryan, Exxon Nuclear Co., Inc.

NRC Resident Inspector

*H. Bibb

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on April 30, 1984, with those persons indicated in paragraph 1 above. The licensee acknowledged the inspection findings without significant comment.

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Primary System Valve Leak Checks (92706)

A hydrostatic pressure test was performed as a test requirement following reactor pressure boundary modifications on Unit 1. During performance of the test, but not as a requirement of this test, the inspector accompanied licensee personnel on a tour of the reactor building. A post maintenance visual leak check was made on various primary system valves, some of which included: RCS drain valves, hot leg sample valves, pressurizer safety valves, PORV isolation valves, and pressurizer mini-flow throttle valves. The

valves that were identified as leaking had work orders issued for corrective maintenance.

No violations or deviations were identified within the areas inspected.

6. Rod Drop Time Test (72700)

The Periodic Rod Drop Time Test, procedure no. 1-0110054, was performed to determine the drop time of each control element assembly (CEA) and proper operation of the CEA position indication system.

The first part of the procedure verified extension shaft/CEA latching when the CEAs were pulled individually to a sufficient height and dropped. Test performed on April 17, 1984, identified rod 20 to be uncoupled. Maintenance was performed and the rod was verified to be properly latched. The second part of the procedure provides instructions for the rod drop time test. The acceptance criteria was met in that each of the full length CEA drop time from fully withdrawn position to 90% insertion was less than or equal to 3.1 seconds.

No violations or deviations were identified within the areas inspected.

7. Initial Criticality Following Refueling (72700)

The St. Lucie Unit 1 Cycle 6 core consists of ninety two (92) Exxon Nuclear Company, Inc., reload assemblies and 125 exposed assemblies supplied by Combustion Engineering. During the approach to initial criticality the CEA block circuits were checked as CEAs were withdrawn. CEA groups A and B were withdrawn first followed by the regulating CEA groups in manual sequential mode until group 7 was approximately 55 inches withdrawn. As RCS boron concentration dilution was initiated, plots of inverse count rate ratios vs dilution time and plots of RCS, Pressurizer, and boronometer boron concentrations vs. dilution time were maintained. Criticality was achieved with Regulating Group 7 at 66" withdrawn, and a boron concentration of 1367 ppm at 0440 April 27, 1984. Predicted critical boron concentration was 1425 ppm with group 7 at 55" withdrawn. Reactor conditions were maintained in preparation for zero Power Physics Testing.

No violations or deviations were identified within the areas inspected.

8. Unit 1 Cycle 6 Zero Power Physics Tests (ZPPT) (61708, 61710, 72700)

Operating procedure no. 1-0110052, ZPPT After Reload, describes the tests which were performed in order to determine the acceptability of the Cycle 6 physics data base. The procedure prescribes the order in which the tests were performed with their respective acceptance criterion. The inspector witnessed portions of and verified test results for all of the following tests.

a. Reactivity Computer Checkout

The minimum flux level at which the reactor was operated during ZPPT was established as that level which was sufficient to overcome the noise band on the reactivity computer. The maximum flux level during ZPPT was to be the lower end of the decade in which nuclear heating was found to occur or 1×10^{-1} % of rated power if nuclear heating was not reached by 1×10^{-1} % of rated power. The minimum and maximum allowable power level was set at 1×10^{-1} % and 2×10^{-2} % respectively. The decade at which ZPPT was performed was 5×10^{-2} %.

The computer calibration was performed by a positive and negative period check. The correction factors determined by these checks were found to be within the tolerance of 1.00 ± 0.1 .

b. CEA Latch Verification

CEA Group 7 latch verification was made by individually inserting and withdrawing each CEA. Groups 6, 5, 4, 3, 2 and 1 latch verification was made by using the manual individual mode to insert each CEA until a reactivity change occurred, then the CEA was withdrawn. Latch verification and symmetry checks for shutdown banks B and A was performed and duals (symmetric rods) indicated reactivity was within $\pm 2\frac{1}{2}$ % of the average reactivity indicated for all Group A duals.

c. Unrodded Critical Boron Concentration (CBC)

To determine the all rods out, ARO, CBC the reactor coolant boron concentration was increased while CEA group 7 was withdrawn to approximately 121 inches to maintain power and reactivity swings. CEA group 7 was then moved to its Upper Exercise Limit (UEL). This change in reactivity along with other core conditions was used in the boron endpoint calculation. The measured ARO boron concentration was determined to be 1396 ppm which met the acceptance criteria of being within ± 100 ppm of the predicted ARO boron concentration of 1465 ppm.

d. Isothermal Temperature Coefficient, (ITC) and Moderator Temperature Coefficient, (MTC), Determination

The ITC was determined by decreasing and increasing RCS temperature 6 to 8°F by changing steam bypass or dumping. The change in temperature and associated reactivity changes were used to calculate the ITC. The average ITC was found to be $+0.26 \times 10^{-4} \Delta k/k/^\circ F$. The measured MTC was found to be $+0.42 \times 10^{-4} \Delta k/k/^\circ F$ which met the acceptance criteria of being less positive than the value specified in Technical Specifications.

e. CEA Groups 7, 6, 5, 4, 3, 2 and 1 Worths

The reactor coolant boron concentration was decreased as CEA groups 7 and 6 were inserted to their Lower Exercise Limit (LEL) by using manual group control mode to maintain power and reactivity swings. The measured Hot Zero Power CEA group 7 worth was determined to be 0.505% delta rho. Group 6 Hot Zero Power worth was found to be 0.360% delta rho. Both met the acceptance criteria by being within $\pm 15\%$ or $\pm 1\%$ delta rho of the design regulating CEA worths, whichever was greater.

Similarly, CEA Groups 5, 4, 3, 2 and 1 worths were determined by diluting each CEA group to its LEL. Each CEA group worth met the acceptance criteria by being within the design tolerance specified above.

No violations or deviations were identified within the areas inspected.

9. Control Room Tours (92706)

Visits to the control room were made to observe activities in progress. The inspector observed instrumentation and recorder traces for abnormalities, verified proper control room manning, and verified that operators were adhering to approved operating procedures.

No violations or deviations were identified within the areas inspected.