

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-219/80-34

Docket No. 50-219

License No. DPR-16 Priority - Category C

Licensee: Jersey Central Power and Light Company

Madison Avenue at Punch Bowl Road

Morristown, New Jersey 07960

Facility Name: Oyster Creek Nuclear Generating Station

Inspection at: Forked River, New Jersey

Inspection conducted: November 6-7, 1980

Inspectors: L. H. Bettenhausen
L. H. Bettenhausen, Ph.D., Reactor Inspector

12/11/80
date signed

W. M. Troskoski
W. M. Troskoski, Reactor Inspector

12/11/80
date signed

Approved by: D. L. Caphton
D. L. Caphton, Chief, Nuclear Support
Section No. 1, RO&NS Branch

12/11/80
date signed

Inspection Summary: Inspection on November 6-7, 1980 (Report No. 50-219/80-34)

Areas Inspected: Routine, unannounced inspection by region-based inspectors of post-refueling startup testing for cycle 9 begun in July, 1980, including control rod scram and reactivity checks, core power distributions, average power range monitor and local power range monitor calibrations and reactivity anomaly checks. The inspection involved 26 inspector hours on site by two NRC region-based inspectors.

Results: No items of noncompliance were identified in the six areas inspected.

DETAILS

1. Persons Contacted

*J. Carroll, Director, Oyster Creek Operations
*K. Fickeissen, Plant Engineering Manager
*J. Molnar, Core Manager
A. Rone, Engineering Manager
R. Thompson, Reactor Engineer

*J. Thomas, USNRC Resident Reactor Inspector

*Present at exit interview conducted November 7, 1980.

2. Licensee Action on Previous Inspection

Findings

(Closed) Unresolved Item (219/79-09-02): Revise Procedure 1001.17, Reactivity and Anomaly Check, to reflect present licensee practice. In Fuel Cycle 8, the check was based upon calculations for 1900 Mw instead of the 1930 Mw licensed power of the procedure. For the present Fuel Cycle 9, the calculations are following the 1930 Mw of the procedure. The procedure does not require revision for Cycle 9. This item is resolved.

(Closed) Unresolved Item (219/79-09-01): Develop procedure to define method and frequency for LPRM calibration. A section of Procedure 1001.12, Power Distribution Measurement, describes the method for LPRM calibration. A temporary procedure change to 1001.12 was initiated on November 7, 1980 to require LPRM calibration every effective full power month; this change will be permanently incorporated in the procedure. This item is resolved.

3. Reload Information for Oyster Creek Cycle 9

Licensee representatives discussed the reload analysis for Cycle 9 with the inspector. The reload was conducted under the provisions of 10 CFR 50.59. The inspector examined the document, "Reload Information and Safety Evaluation Report for Oyster Creek Cycle 9 Reload", Revision 7, May 15, 1980, General Public Utilities, and independently developed acceptance criteria for startup tests. The Cycle 9 reload used 160 Type VB 8x8 fuel bundles supplied by Exxon. The target energy production for Cycle 9 is 595 Gwd (Gigawatt-day).

The inspector had no further questions. No items of noncompliance were identified.

4. Startup Testing Following Refueling

The inspector reviewed the following tests and checks to verify that the testing was done in accordance with technically adequate procedures and as required by Technical Specification:

- a. Control Rod Scram Insertion Time Test, Procedure 617.4.003, Revision 3, dated June 13, 1979 was initiated on May 30, 1980 with the following results:

<u>Insertion</u>	<u>Average Measured Scram Time</u>	<u>TS Average Times to be No Greater Than</u>
5%	0.367	0.375 sec.
20%	0.807	0.900
50%	1.779	2.00
90%	3.058	5.00

- In addition, all four-rod groups were within the acceptance criteria.
- b. Power Distribution Measurement, Procedure 1001.12 describes the data collection and analysis used to ascertain core power distribution and verify that thermal-hydraulic parameters are within limitations of Technical Specifications. The inspector reviewed the data and results of power distribution measurements numbered 9002 through 9004 and 9006-9009 and performed between July 20, 1980 and September 29, 1980.

The procedure also contains provisions for LPRM calibrations. The inspector reviewed LPRM calibration data sheets for July 20, 1980 and for September 9, 1980. The inspector discussed previous inspection findings (see Paragraph 2) regarding frequency of LPRM calibration. As a result of these discussions, a temporary change to Procedure 1001.12 was initiated to specify that LPRM calibration will be done each effective full power month. Licensee representatives stated that the change will be made permanent in the next procedure revision.

Daily demonstration of core performance within Technical Specification limits is done in accordance with Procedure 1001.33, Core Daily Checks, Revision 3, August 28, 1979. Traversing Incore Probe measurements at limiting core locations are analyzed and reviewed by nuclear engineers to assure that peaking factors, local linear heat generation rates, average planar linear heat generation rates and critical power ratios are within limits. The inspector randomly reviewed completed daily checks for the period July 19, 1980 to September 30, 1980.

- c. Two different aspects of APRM calibration were inspected. The instrumentation surveillance test is conducted under Procedure

620.3.003, APRM Surveillance Test and Calibration, Rev. 6, January 9, 1980. The inspector reviewed data for performance of this calibration test procedure at approximately weekly intervals in the period June 17, 1980-September 22, 1980. The nuclear plant operators compare APRM readings to computer-generated core heat balance approximately once per shift and adjust the APRM gain, if needed. The satisfactory gain adjustment is noted in the plant operating log each time the comparison is made. The inspector reviewed log entries for the period July 19, 1980 through August 31, 1980.

- d. Shutdown Margin Demonstration, Procedure 1001.26, Revision 3, December 6, 1979, performed May 18, 1980 demonstrated by experiment that the reactor remained subcritical upon withdrawal of selected pairs of rods in the upper-left quadrant of the reactor, and, by consideration of symmetry, the rest of the reactor. The actual shutdown margin was measured by performance of Procedure 1001.27, Shutdown Margin Measurement Test, Revision 7, December 6, 1979, performed May 18, 1980 with the vessel at 91.5°F and the head removed. Results were summarized in a memo, Oyster Creek BOC 9 Shutdown Margin Calculation and XTRA Cold Bias Results, June 2, 1980. Control rod 06-27 was analytically determined to be the highest worth rod. It was withdrawn along with adjacent rod 10-31 fully withdrawn and adjacent rod 10-23 withdrawn to notch position 28 for criticality. The reactivity worth of rod 10-31 was then calibrated by rod exchange and reactor period measurements. The experimentally determined shutdown margin was determined to be 0.555% Δk with rod 06-27 withdrawn. The required shutdown margin was 0.432% (0.25 TS + 0.09 inverted control rod tubes + 0.068 for R value + 0.024 temperature correction). The test satisfactorily demonstrated adequate margin. The inspector questioned the difference in R-value used in the acceptance criterion for the test and the R-value which appeared in the reload analysis (referenced in paragraph 3). Licensee representatives reviewed the calculations and stated that eigenvalues in the reload analysis report were rounded to four significant figures; the acceptance criterion was obtained from the calculations themselves with no rounding. This satisfactorily explained the discrepancy.
- e. Reactivity anomaly is predicted through Procedure 1001.16, Reactivity Anomaly Curve Development, Revision 0, December 5, 1975. This procedure requires a series of XTRA calculations for rated power (1930 MWT) and recirculation flow for various burnup steps. The resulting reactivity insertions are converted to control rod notches and plotted as a function of burnup, along with $\pm 0.5\%$ warning and $\pm 1\%$ control curves.

Actual rod notch insertions are then obtained per Procedure 1001.17, Reactivity Anomaly Check, Revision 2, April 4, 1979 and converted to

effective full power month. These points are compared to the predicted rod notch worth versus burnup curve for the reactivity anomaly check. The inspector reviewed the calculations, the curve development, and the four data points obtained to date in Cycle 9.

No items of noncompliance were identified.

4. Exit Interview

A management meeting was held with licensee personnel (denoted in paragraph 1) at the conclusion of the inspection on November 7, 1980. The purpose, scope and findings of this inspection were presented.