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ComEd

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United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

LaSalle County Station, Unit 1
Facility Operating License No. NPF-11
NRC Docket No. 50-373

Subject: Startup Report for LaSalle County Station Unit 1 Cycle 9

Enclosed, in accordance with Technical Specification 6.6.A.1, is the LaSalle County Station Unit 1 Cycle 9 Startup Report. The submittal of this report is required within 90 days of resumption of commercial power operation when fuel from a different fuel supplier is installed. The new fuel supplier for Cycle 9 is Siemens Power Corporation.

LaSalle County Station Unit 1 Cycle 9 began commercial operation on November 22, 1999 following a refueling and maintenance outage. The Unit 1 Cycle 9 core loading consisted of 372 fresh Siemens Power Corporation ATRIUM-9B fuel bundles and 392 reload bundles manufactured by General Electric. Additionally, installed in the Unit 1 Cycle 9 reactor were six new Reuter-Stokes NA-300 Local Power Range Monitors (LPRM's), eight new General Electric Marathon control rod blades, and three new General Electric Duralife 215 control rod blades.

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Attached are the evaluation results from the following tests:

- Core Verification
- Single Rod Subcritical Check
- Control Rod Friction and Settle Testing
- Control Rod Drive Timing
- Shutdown Margin Test (In-sequence critical)
- Reactivity Anomaly Calculation (Critical and Full Power)
- Scram Insertion Times
- Core Power Distribution Symmetry Analysis

All test data was reviewed in accordance with the applicable test procedures, and exceptions to any results were evaluated to verify compliance with Technical Specification limits and to ensure the acceptability of subsequent test results.

Should you have any questions concerning this letter, please contact Mr. Frank A. Spangenberg, III, Regulatory Assurance Manager, at (815) 357-6761, extension 2383.

Respectfully,

Jeffrey A. Benjamin
Site Vice President
LaSalle County Station

Attachment

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – LaSalle County Station

LTP-1700-1, Core Verification

Purpose

The purpose of this test is to visually verify that the core is loaded as intended for Unit 1 Cycle 9 operation.

Criteria

The as-loaded core must conform to the cycle core design used by the Core Management Organization (Nuclear Fuel Management) in the reload licensing analysis. The core verification must be observed by a member of the Commonwealth Edison Company staff. Any discrepancies discovered in the loading will be promptly corrected and the affected areas re-verified to ensure proper core loading prior to unit startup.

Conformance to the cycle core design will be documented by a permanent core serial number map signed by the audit participants.

Results and Discussion

Core verification was performed concurrently with core load. The Unit 1 Cycle 9 core verification consisted of a core height, assembly orientation, assembly location, and assembly seating check performed by reactor services and reactor engineering personnel. Bundle serial numbers and orientations were recorded during the videotaped scans for comparison to the appropriate core loading map and Cycle Management documentation. On November 15, 1999, the core was verified as being properly loaded and consistent with the Commonwealth Edison Nuclear Fuel Management LaSalle 1 Cycle 9 Design Basis Loading Plan.

LTP-1600-30, Single Rod Subcritical Check

Purpose

The purpose of this test is to demonstrate that the Unit 1 Cycle 9 core will remain subcritical upon the withdrawal of the analytically determined strongest control rod.

Criteria

The core must remain subcritical, with no significant increase in SRM readings, with the analytically determined strongest rod fully withdrawn.

Results and Discussion

The analytically determined strongest rod for the Beginning of Cycle 9 for Unit 1 was determined by Nuclear Fuel Management to be rod 50-19. On November 15, 1999, with a Unit 1 moderator temperature of 93 degrees Fahrenheit, rod 50-19 was withdrawn to the full out position (48) and the core remained subcritical with no significant increase in SRM readings. The satisfactory completion of LTP-1600-30, Single Rod Subcritical Check, allows single control rod withdrawals for control rod testing. This information is documented on LTP-1600-30, Attachment A.

LTP-700-2, Control Rod Friction and Settle Testing

Purpose

The purpose of this test is to demonstrate that excessive friction does not exist between the control rod blade and the fuel assemblies during operation of the control rod drive (CRD) following core alterations.

Criteria

With the final cell loading complete for the fuel assemblies in a control cell, the drift alarm shall not be received when moving the control rod from position 00 to 02, and then to 04.

Friction testing shall be performed on the respective control rod drives(s) when any condition listed below is applicable:

- After relocation or replacement of the CRD.
- After relocation or replacement of Control Rod Blades.
- After maintenance or modification of an installed CRD that could affect the performance of the drive.
- Prior to initial criticality of a new operating cycle, for any cell when any condition listed below is met:
    - A channel in the cell is beginning its third cycle in a peripheral location.
    - The combined peripheral residence time for any two channels in a control cell exceeds 4 cycles.
    - Bundle-average exposure for any fuel in the control cell exceeds 30 GWD/ST (~27.24 GWD/MT).
- The Unit Nuclear Engineer or CRD System Engineer determines that friction testing is appropriate.

Results and Discussion

Control Rod Drive (CRD) Friction testing commenced after the completion of the core load verification and single rod subcritical check. There was no indication of excessive friction on the control rods tested as described above since none of the rods tested produced a drift alarm. The testing was completed on November 19, 1999.

LOS-RD-SR5, Control Rod Drive Timing

Purpose

The purpose of this test is to check and set the insert and withdrawal speeds of Control Rod Drives (CRDs).

Criteria

LOS-RD-SR5, Control Rod Drive Timing, requires withdraw times from the full in (notch 00) to the full out (notch 48) position to be between 50 and 58 seconds and insert times from the full out to the full in position to be between 40 and 48 seconds.

Results and Discussion

LOS-RD-SR5 was performed for the drives that were changed out during the outage and the majority of drives in rod group 2 (the initial critical was predicted to occur in rod group 2). Timing was completed satisfactory for these rods on November 20, 1999.

Additionally, if rod timing anomalies (double notching) are identified during the cycle, then the applicable rods will be timed per LOS-RD-SR5.

LTS-1100-1, Shutdown Margin Test

Purpose

The purpose of this test is to demonstrate, from a normal in-sequence critical, that the core loading has been limited such that the reactor will remain subcritical throughout the operating cycle with the strongest worth control rod in the full-out position (position 48) and all other rods fully inserted.

Criteria

If a shutdown margin (SDM) of 0.38% delta K/K + R cannot be demonstrated with the strongest worth control rod fully withdrawn, the core loading must be altered to meet this margin. R is the reactivity difference between the core's beginning-of-cycle SDM and the minimum SDM for the cycle. The R value for Cycle 9 is 0.29% delta K/K, so a SDM of 0.67% delta K/K must be demonstrated.

Results and Discussion

The beginning-of-cycle SDM was successfully determined from the initial critical data. The initial Cycle 9 critical occurred on November 21, 1999 on control rod 42-15 at position 12, using an A-2 sequence. The moderator temperature was 134 degrees F and the reactor period was 183 seconds. Using rod worth information, moderator temperature reactivity corrections, and period reactivity corrections supplied by Nuclear Fuel Management, the beginning-of-cycle SDM was determined to be 1.063% delta K/K. The SDM exceeded the 0.67% delta K/K that was required to satisfy Technical Specification 3.1.1.

LTS-1100-2, Checking for Reactivity Anomalies
NF-AB-451, Reactivity Anomaly Determination

Purpose

The purpose of this test is to compare the actual and predicted critical rod configurations to detect any unexpected reactivity trends.

Criteria

In accordance with Technical Specification 3.1.2, the reactivity equivalence of the difference between the actual critical control rod pattern and the predicted critical control rod pattern shall not exceed 1% delta K/K. If the difference does exceed 1% delta K/K, the Core Management Engineers (Nuclear Fuel Management) will be promptly notified to investigate the anomaly. The cause of the anomaly must be determined, explained, and corrected for continued operation of the unit.

Results and Discussion

Two reactivity anomaly calculations were successfully performed during the Unit 1 Cycle 9 Startup Test Program -- one from the in-sequence critical and one from steady-state, equilibrium conditions at approximately 100 percent of full power.

The initial critical occurred on November 21, 1999, on control rod 42-15 at position 12, using an A-2 sequence. The moderator temperature was 134 degrees F and the reactor period was 183 seconds. Using rod worth information, moderator temperature, reactivity corrections, and period reactivity corrections supplied by Nuclear Fuel Management, the actual critical was determined to be within 0.327% delta K/K of the predicted critical. The anomaly determined is within the 1% delta K/K allowed by Technical Specification 3.1.2.

The reactivity anomaly calculation for power operation was performed on December 10, 1999. The data used was from 99.2% power at a cycle exposure of 393.5 MWD/MT at equilibrium conditions. The expected K_{eff} supplied by Nuclear Fuel Management was 1.0026. The actual K_{eff} was 1.0029. The resulting anomaly was 0.03% delta K/K. This value is within the 1% delta K/K criteria of Technical Specification 3.1.2.

LTS-1100-4, Scram Insertion Times

Purpose

The purpose of this test is to demonstrate that the control rod scram insertion times are within the operating limits set forth by the Technical Specifications (3.1.3.2, 3.1.3.3, 3.1.3.4).

Criteria

The maximum scram insertion time of each control rod from the fully withdrawn position (48) to notch position 05, based on de-energization of the scram pilot valve solenoids as time zero, shall not exceed 7.0 seconds.

The average scram insertion time of all operable control rods from the fully withdrawn position (48), based on de-energization of the scram pilot valve solenoids as time zero, shall not exceed any of the following:

Position Inserted From Fully Withdrawn	Average Scram Insertion Time (Seconds)
45	0.43
39	0.86
25	1.93
05	3.49

The average scram insertion time, from the fully withdrawn position (48), for the three fastest control rods in each group of four control rods arranged in a two-by-two array, based on de- energization of the scram pilot valve solenoids as time zero, shall not exceed any of the following:

Position Inserted From Fully Withdrawn	Average Scram Insertion Time (Seconds)
45	0.45
39	0.92
25	2.05
05	3.70

Results and Discussion

Scram testing was successfully completed on November 23, 1999. 51 rods were scram timed during the reactor pressure vessel leakage test (Hydro) prior to startup. The remaining 134 rods were scram timed during reactor startup. All control rods were scram timed from full out. All control rod scram timing acceptance criteria were met during this test. The results of the testing are given below.

Position	Core Average Scram Times of all CRDs (sec)	Average Scram Times in a Two-by-Two Array (sec)
45	0.341	*
39	0.646	*
25	1.375	*
05	2.485	*

* The average scram times for the three fastest rods in a two-by-two array were not explicitly calculated since all control rod individual times in the entire core were less than the required Technical Specification Average scram insertion times.

LTP-1600-17, Core Power Distribution Symmetry Analysis

Purpose

The purpose of this test is to verify the core power symmetry.

Criteria

The χ^2 value of the total measured TIP uncertainty must be less than the critical value at the 1% confidence level (i.e., 36.19).

The gross check of the TIP signal symmetry should yield a maximum deviation between symmetrically located pairs of less than 25%.

Results and Discussion

Core power symmetry calculations were performed based upon data obtained from a full core TIP set (OD-1) performed on November 24, 1999 at approximately 65% power. The χ^2 value was 2.21, which satisfies the test criteria of 36.19. The maximum deviation between symmetrical TIP pairs was 7.50%, which is within the 25% acceptance criteria.

Core power symmetry calculations were also performed based upon data obtained from a full core TIP set (OD-1) performed on November 27, 1999 at approximately 98% power. The χ^2 value was 1.75, which satisfies the test criteria of 36.19. The maximum deviation between symmetrical TIP pairs was 6.76%, which is within the 25% acceptance criteria.