Entergy

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David N. Lorfing
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RBG-46992

January 13, 2010

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Cycle 16 Startup Report
River Bend Station, Unit 1
Docket No. 50-458
License No. NPF-47

Dear Sir or Madam:

In accordance with River Bend Station (RBS) Technical Requirements Manual TR 5.6.8, enclosed is a Startup Report that provides a summary of the startup physics testing conducted on the Cycle 16 core reload.

If you have any questions or require additional information, please contact David Lorfing, Manager, Licensing at (225) 381-4157.

Sincerely,

David N. Lorfing

Manager, Licensing
River Bend Station - Unit 1

DNL/bmb

Attachment

IE26
NRR

cc: Regional Administrator
U. S. Nuclear Regulatory Commission
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612 E. Lamar Blvd., Suite 400
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NRC Senior Resident Inspector
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U. S. Nuclear Regulatory Commission
Attn: Mr. Alan B. Wang
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Mr. Jeffrey P. Meyers
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ATTACHMENT TO

RBG-46992

Cycle 16

Startup Physics Test Summary

ENTERGY OPERATIONS, INC.
RIVER BEND STATION

Cycle 16

Startup Physics Test Summary

OVERVIEW

River Bend Station (RBS) resumed commercial operation in Cycle 16 on October 17, 2009, following a Refueling/Maintenance Outage. The Cycle 16 reload consisted of replacing 216 Atrium 10 AREVA fuel assemblies with 216 GE14 General Electric fuel assemblies. No other revision to the design or operation of the station were conducted which would affect the scope of this report.

The following startup tests were performed during Refueling Outage RF15 or while attaining full power after RF15, and are summarized in this report:

1) Core Loading Verification

2) Control Rod Functional Testing

3) Shutdown Margin Determination

4) TIP Asymmetry

In addition to the above startup physics tests, the startup test program included: Core Monitoring System Verification, and other surveillance testing required by RBS Technical Specifications. The additional test results are available at the site on request.

CORE LOADING VERIFICATION

Purpose

Ensure each reactor fuel assembly is:

- In its correct core location
- Oriented properly
- Seated properly in its support piece

Criteria

The reactor core is visually checked to verify conformance to the vendor supplied core loading pattern. Fuel assembly serial numbers, orientations, and core locations are recorded. A height check is performed to verify all assemblies are properly seated.

Results

The as-loaded core was verified for proper fuel assembly serial numbers, locations, orientation and seating in accordance with the RBS Cycle 16 core loading pattern. There were no location or orientation deviations from the Cycle 16 core loading pattern.

The core verification procedure was successfully completed on October 9, 2009.

CONTROL ROD FUNCTIONAL TESTING

Purpose

Verify functionality of each control rod by:

- Performing normal withdrawals and insertions
- Ensuring it is latched to its control rod drive
- Assuring that it moves at design speeds without excessive friction

Criteria

Functional testing of each control rod is performed to ensure proper operability. This testing includes withdrawal and insertion timing, coupling verification, friction testing where required, and scram time testing.

Results

Friction testing was not required for any control rods based on the channel management analysis for BOC 16.

All control rods were individually timed during withdrawal and insertion sequence. Control rods with stroke times outside the tolerance of normal stroke time +/- 10% were readjusted to within the normal stroke time +/- 10%. This was in accordance with GE recommendations. Rod speeds are monitored by Plant Procedures.

Nine (9) Control Rod Drive Mechanisms were replaced during the outage. They were scram time tested prior to startup during the vessel pressure test in accordance with Technical Specification Surveillance Requirements 3.1.4.3 and 3.1.4.4 with satisfactory results.

The remaining control rods were scram time tested during the vessel pressure test in accordance with RBS Technical Specification Surveillance Requirement 3.1.4.1. All of the control rod scram times were within the acceptance criteria, with the exception of one control rod 20-25. Control rod 20-25 was retested at 0 PSIG on October 17, 2009, for operability prior to start up and retested at rated conditions on October 19, 2009, to meet acceptance criteria. All control rods were tested and satisfactorily met the acceptance criteria prior to exceeding 40 percent rated core thermal power.

A control rod coupling check was performed in accordance with RBS Technical Specification Surveillance Requirement 3.1.3.5 each time a control rod was fully withdrawn.

SHUTDOWN MARGIN DETERMINATION / REACTIVITY ANOMALY CHECK

Purpose

To ensure that:

- The reactor can be made sub-critical from all operating conditions
- The reactivity transients associated with postulated accident conditions are controllable within acceptable limits
- The reactor will be maintained sufficiently sub-critical to preclude inadvertent critically in the shutdown condition

Criteria

The in-sequence rod withdrawal shutdown margin calculation begins by withdrawing control rods in their standard sequence until criticality is achieved. The shutdown margin of the core is determined from calculations based on the critical rod pattern, the reactor period and the moderator temperature.

Reactivity Anomaly verification is performed in accordance with Technical Specification Surveillance Requirement 3.1.2.1 after reaching equilibrium xenon concentrations at 100% reactor power.

Results

The in-sequence critical shutdown margin surveillance procedure was completed on October 17, 2009. The shutdown margin (SDM) at the beginning-of-cycle (BOC) was calculated to be 1.31 % delta k/k which is bounded by RBS Technical Specification 3.1.1 requirement of 0.38% delta k/k. Final steady state full power operation was achieved on October 25, 2009.

It was verified on October 26, 2009, that no reactivity anomaly was present by performance of Technical Specification Surveillance Requirement 3.1.2.1.

TIP ASYMMETRY CHECK

Purpose

To determine the reproducibility of the Traversing Incore Probe (TIP) system readings

Criteria

An asymmetry determination is performed as part of a detailed statistical uncertainty evaluation of the TIP System. A complete set of TIP data is obtained at steady state conditions while greater than 75% rated core thermal power.

The symmetry check is a function of determining the mean deviations from the symmetric pairs of TIP strings.

Results

The TIP reproducibility and symmetry uncertainty calculations were performed on October 27, 2009, at 100% core thermal power.

The determined symmetry is 3.34% which is bounded by the acceptance criteria of 6%.