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RBG-47960

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ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: River Bend Station Cycle 21 Startup Report

River Bend Station – Unit 1
NRC Docket No. 50-458
Renewed Facility Operating License No. NPF-47

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 21 core reload.

This letter does not contain any new commitments.

If you require additional information, please contact Mr. Tim Schenk at (225) 381-4177 or tschenk@entergy.com.

Respectfully,

Tim Schenk

TAS/baj

Enclosure: River Bend Station Cycle 21 Startup Report

cc: NRC Regional Administrator - Region IV
NRC Project Manager - River Bend Station
NRC Senior Resident Inspector - River Bend Station
Louisiana Department of Environmental Quality
Public Utility Commission of Texas

**Enclosure**

**RBG-47960**

**River Bend Station Cycle 21 Startup Report**

**(3 Pages)**

**ENTERGY OPERATIONS, INC.**
**RIVER BEND STATION**

**Cycle 21**

**Startup Physics Test Summary**

OVERVIEW

River Bend Station (RBS) resumed commercial operation in Cycle 21 on May 11, 2019 following a Refueling/Maintenance Outage. The Cycle 21 reload consisted of replacing 216 Global Nuclear Fuel (GNF) GNF2 fuel assemblies with 216 GNF GNF3 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 (RF) 20 or while attaining full power after RF20, and are summarized in this report:

1) Core Loading Verification

2) Control Rod Scram Time Testing

3) Shutdown Margin Determination/Reactivity Anomaly Check

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 21 core loading pattern. There were no location or orientation deviations from the Cycle 21 core loading pattern.

The core verification procedure was successfully completed on May 3, 2019.

## 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

Criteria

Testing of each control rod is performed in accordance with technical specification to ensure proper operability. This testing includes coupling verification, and scram time testing.

Results

All control rods were scram timed tested and coupling verified as discussed below.

Fifteen (15) Control Rod Drive Mechanisms and ten (10) Control Rod Blades were replaced during the outage. Seven (7) hydraulic control units had maintenance completed. All rods 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.

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 to satisfy SR 3.1.1.1.a.

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 May 11, 2019. The shutdown margin at the beginning-of-cycle was calculated to be 1.303% delta k/k which is bounded by RBS Technical Specification 3.1.1 requirement of 0.38% delta k/k. It was verified on May 17, 2019, that no reactivity anomaly was present by performance of Technical Specification Surveillance Requirement 3.1.2.1.

Final steady state full power operation was achieved on June 18, 2019.