

GGNS UNIT 1 CYCLE 4
PROPOSED STARTUP PHYSICS TESTS
NOVEMBER 1988

8812120140 881206
PDR ADOCK 05000416
P PDC

Proposed Startup Physics Tests for Cycle 4

1. Core Loading Verification

The core will be visually checked to verify conformance to the vendor supplied core loading pattern. Fuel assembly serial numbers, bundle orientations, and core locations will be recorded. A height check will be performed to assure that all assemblies are properly seated in their respective locations.

2. Control Rod Functional Testing

Prior to criticality following the refueling outage, functional testing of the control rods will be performed to assure proper operability. This testing will include coupling verification, withdrawal and insertion timing, and friction testing where required. The subcriticality of the reloaded core with an individual control rod fully withdrawn will be verified by monitoring the nuclear instrumentation.

3. Shutdown Margin Determination

Control rods will be withdrawn in their standard sequence until criticality is achieved. The shutdown margin of the core will be determined from calculations based upon the critical rod pattern, the reactor period, and the moderator temperature. To assure there is no reactivity anomaly, the actual critical control rod position will be verified to be within 1% dk/k of the predicted critical control rod position.

4. TIP Asymmetry

A gross asymmetry check will be performed as part of a detailed statistical uncertainty evaluation of the TIP system. A complete set of TIP data will be obtained at a steady state, equilibrium xenon condition greater than 85% rated power. A total average deviation or uncertainty will be determined for all symmetric TIP pairs as well as the maximum absolute deviation. The results will be evaluated to assure proper operation of the TIP system and symmetry of the core loading.

Proposed Startup Physics Tests for Cycle 4

1. Core Loading Verification

The core will be visually checked to verify conformance to the vendor supplied core loading pattern. Fuel assembly serial numbers, bundle orientations, and core locations will be recorded. A height check will be performed to assure that all assemblies are properly seated in their respective locations.

2. Control Rod Functional Testing

Prior to criticality following the refueling outage, functional testing of the control rods will be performed to assure proper operability. This testing will include coupling verification, withdrawal and insertion timing, and friction testing where required. The subcriticality of the reloaded core with an individual control rod fully withdrawn will be verified by monitoring the nuclear instrumentation.

3. Shutdown Margin Determination

Control rods will be withdrawn in their standard sequence until criticality is achieved. The shutdown margin of the core will be determined from calculations based upon the critical rod pattern, the reactor period, and the moderator temperature. To assure there is no reactivity anomaly, the actual critical control rod position will be verified to be within 1% dk/k of the predicted critical control rod position.

4. TIP Asymmetry

A gross asymmetry check will be performed as part of a detailed statistical uncertainty evaluation of the TIP system. A complete set of TIP data will be obtained at a steady state, equilibrium xenon condition greater than 85% rated power. A total average deviation or uncertainty will be determined for all symmetric TIP pairs as well as the maximum absolute deviation. The results will be evaluated to assure proper operation of the TIP system and symmetry of the core loading.