Nebraska Public Power District

COOPER NUCLEAR STATION
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CNSS898288
August 15, 1989

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

References: (1) Letter from J. M. Pilant to T. A. Ippolito, dated April 16, 1979, "Reload 4, Cycle 5 - Startup Physics Testing".

Subject: Reload 12, Cycle 13 - Startup Physics Testing
Cooper Nuclear Station
NRC Docket No. 50-298, DPR-46

Gentlemen:

This letter is to inform you that the acceptance criteria for the startup physics tests described in Reference 1 has been met for the recent Cycle 13 startup. Detailed results of the testing are available at Cooper Nuclear Station for review.

If you have any questions or require clarification on any of the tests, please call.

Sincerely,

G. A. Trevors
G. A. Trevors
Division Manager
Nuclear Support

GAT:JET:nd

Attachment

cc: U. S. Nuclear Regulatory Commission
Region Office - Region IV

NRC Resident Inspector
Cooper Nuclear Station

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1. CORE LOADING VERIFICATION

I. PURPOSE

The purpose of this test is to visually verify that the core is loaded as intended.

II. DESCRIPTION

An underwater television camera or suitable viewing device will be employed to verify both proper orientation and location of each fuel assembly in the reactor core. At least one independent person must also either participate in performing the verification or review a videotape of the verification prior to startup.

III. CRITERIA AND ACTIONS

The as-loaded core must conform with the referenced core upon which the licensing analysis was performed. Any discrepancies discovered in the loading will be promptly corrected and the affected areas reverified to be properly loaded prior to startup.

Conformance to the referenced loading will be demonstrated by a permanent core serial number map and documented by the signatures of the verifiers.

IV. SUMMARY OF RESULTS

The as-loaded core was found to conform exactly with the referenced core upon which the licensing analysis was performed. Permanent records of the verification are stored in the plant record file.

2. CONTROL ROD OPERABILITY AND SUBCRITICALITY CHECK

I. PURPOSE

This test is performed to assure that no gross local reactivity irregularities exist and that all operable control rods are functioning properly.

II. DESCRIPTION

The control rod mobility test will be performed after the four bundles surrounding the given control rod are loaded. The subcriticality check will be performed after the core loading has been completed. Performance of this test will provide assurance that criticality will not occur due to the withdrawal of a single rod. Each control rod in the core will be withdrawn and inserted one at a time to assure its mobility with drive pressure. Also, the nuclear instrumentation will be monitored during the movement of each control rod to verify subcriticality.

III. CRITERIA AND ACTIONS

For those control rods that will not move under normal drive pressure, appropriate repairs or adjustments will be made so that the drive pressure criteria can be met or the rod will be declared inoperable as described in the Technical Specifications. If criticality were to be achieved by the withdrawal of a single control rod, the control rod would be inserted and all further rod movements would cease and an investigation would be conducted to determine the cause.

IV. SUMMARY OF RESULTS

All control rods moved satisfactorily under normal drive pressure and the core remained subcritical during the individual withdrawal of each control rod.

3. TIP SIGNAL UNCERTAINTY TEST

I. PURPOSE

The purpose of this test is to determine the Traversing In-Core Probe (TIP) System total uncertainty using a statistical analysis.

II. DESCRIPTION

Total TIP signal uncertainty consists of geometric and random noise components. Data to perform the analysis are obtained at intermediate power levels and/or power levels greater than 75% with the reactor operating at steady state in an octant symmetric rod pattern (if possible). These data will be additionally used to perform a gross TIP symmetry check, which is a comparison of integrated readings from symmetrically located TIP's.

III. CRITERIA AND ACTIONS

A. The total TIP signal uncertainty (random noise plus geometric uncertainties) for all data sets should be less than 9%. A minimum of two or up to six data sets may be used to meet the above criterion. If the 9% criterion is not met and the calculations have been rechecked, the calibration of TIP system (e.g., axial alignment) shall be checked. It may be necessary to omit data pairs from the analysis if exact octant symmetry is not attainable in fuel loading or control rod patterns. In such cases, offline code predictions of exposure or control rod induced asymmetry may prove useful in explaining the uncertainty.

B. The gross check of TIP signal symmetry should yield a maximum deviation between symmetrically located pairs of less than 25%. If the criterion cannot be met, the cause of the asymmetry must be investigated and an explanation attempted as per Criterion A.

IV. SUMMARY OF RESULTS

A. Four data sets were obtained for the total TIP uncertainty analysis. The total TIP uncertainty was determined to be 6.5% for the first data set and 10.8% for the second data set. TIP detector "D" was subsequently replaced and two additional data sets were obtained. The total TIP uncertainty was found to be 2.4% for the third data set and 2.1% for the fourth data set. This is well within the 9% criterion.

B. Two data sets were used for the gross TIP symmetry analysis. The gross TIP uncertainty was determined to be 10.3% and 8.1%, respectively. This is well within the 25% criterion.