

position, boron concentration and reactivity scale on the reactivity meter. This information is then used with the traces on the strip chart to compute the differential boron worth over the range of RCC bank insertion. The dilution is terminated when the moving RCCA bank is near the full in position (i.e. within 100 pcm of the endpoint bank position).

2.7.2 Boron Endpoint Measurement

After the system has stabilized, the endpoint concentration is determined by insertion of the RCC bank to the full in position. The incremental worth of the RCC bank is estimated by monitoring the flux and reactivity response via the reactivity computer. This last measurement is performed approximately three times, with the incremental worth taken as the average of the three measurements. The endpoint boron concentration is measured at the specified statepoint, with slight differences in system parameters accounted for.

The boron endpoint data for the all rods out configuration is acceptable if the measured endpoint differs by less than 100 ppm from predicted. A review will be performed if the endpoint differs by more than ± 50 ppm from the predicted value.

2.7.3 Rod Worth Measurement by Boron Dilution

The RCC bank predicted to have the greatest worth is measured by boron dilution and the reactivity computer.

The procedure is identical to the differential boron worth determination, and can be performed concurrently

with it (See section 2.7.2 for test description).

After the integral and differential worths are determined, for the reference bank, the worths of the remaining banks are inferred from the rod swap method.

Utilization of the rod swap method requires that the worth of the reference bank be measured by boron dilution. The reference bank is defined as the bank predicted to have the highest worth. In the event that the results of the rod swap method fail to meet the acceptance criteria, all the remaining control bank worths and one of two of the shutdown bank worths will be verified by dilution.

2.7.4 Rod Worth Verification By Rod Swap

Rod worth verification via rod swap techniques involves the measurement of several different statepoints of the reactor. These measurements are then compared to computer predictions of the same statepoints. Good agreement between the measured and predicted statepoint values indicates that the computer model can accurately predict parameters, such as shutdown margin and bank worths.

The remaining five bank worths are inferred in the following manner. The measured reference bank is initially in a full in, or almost full in, position with the reactor just critical. The bank to be measured (bank "X") is then inserted to the full in position, while the reference bank is withdrawn to the critical position. The worth of bank X can now be inferred from the worth of the reference bank. Corrections are made to account for

The review criterion for critical boron concentration at hot full power is that the measured worth is ± 50 ppm of the predicted worth. The acceptance criterion is ± 100 ppm agreement.

4.0 Review and Remedial Action

Each reactor test shall be reviewed by the test engineer for results within the review and acceptance criteria specified for the test. In the event of exceeding a review criteria the data and predictions will be reevaluated in an effort to identify any errors in data reduction or anomalies in calculational logic. This review will be presented to Plant Operations Review Committee (PORC) prior to reaching 100% power. If an acceptance criteria for a low power test is exceeded, a review will be performed and brought before PORC prior to exceeding 5% reactor power. Reactor power shall not exceed 5% without verification of adequate shutdown margin. The technical specifications provide limiting conditions for operation for normal operation and physics testing; compliance with these specifications will be maintained at all times.

The results of all reactor physics tests are reviewed by PORC.