

NRC INSPECTION MANUAL

INSPECTION PROCEDURE 72592

PWR INITIAL CRITICALITY WITNESSING

72592-01 INSPECTION OBJECTIVES

- 01.01 Ascertain conformance of licensee to license and procedural requirements.
- 01.02 Observe operating staff performance.
- 01.03 Ascertain the adequacy of test program records, including evaluation of test results.

72592-02 INSPECTION REQUIREMENTS

02.01 Conformance to License Requirements (Prior to Start of Control Rod Withdrawal)

- a. Identify all technical specifications and license conditions requirements applicable during the initial approach to critical.
- b. By independent inspection of 30% of the applicable technical specifications, exclusive of staffing requirements, verify that the licensee is meeting his license commitments. Items previously verified during initial fuel loading and precritical testing need not be reexamined.
- c. Verify that startup and intermediate nuclear instruments have been properly calibrated and are operating with required count rate and signal-to-noise ratio.
- d. Confirm that trip checks have been performed on nuclear instruments, and that instruments trip in noncoincidence (if required by technical specifications and license conditions).

02.02 Conformance to Administrative and Procedure Requirements

- a. During three separate periods in the test, verify that crew requirements are being met as defined in the procedures, and that staffing satisfies requirements of technical specifications and license conditions regarding licensed operators.

- b. Verify that proper version of the procedure is in use and that it is being followed. Confirm that all referenced procedures have been reviewed and approved.

- c. Verify that 10% (3 minimum) of the prerequisites have been satisfied. Select at least one system-oriented, one procedure-oriented, and one safety-related prerequisite.
- d. Review special instrumentation required by the procedure, its use, and the analysis of data. Review inverse multiplication plots if they are used.
- e. Evaluate adequacy of onsite technical support, by licensee and contractor.

02.03 Review of the "As-run" Procedure

- a. Review all changes or revisions to the test procedure. Confirm that all are properly reviewed and approved.
- b. Review all test deficiencies, their resolution, and retest. Verify that they are reviewed by appropriate management.
- c. Review data sheet entries for legibility, traceability, and permanence.

02.04 Test Results Evaluation

- a. Using the licensee's procedure, independently predict the critical boron concentration with the startup rod pattern. Establish $\pm 1\%$ Δ k tolerances. Update this prediction as necessary, based on test conditions.
- b. During dilution, review licensee's calculations for conformance to predictions.
- c. During dilution, independently verify the rod pattern, and observe one coolant system boron analysis.
- d. If the actual critical is not within 1% of the predicted value, as confirmed by consultation with the reactor engineer (or equivalent technical representative), immediately notify the region. Confirm that the licensee complies with its technical specification, if applicable.
- e. Observe and confirm source to intermediate range nuclear instrumentation overlap test.
- f. Review licensee's test results evaluation, including contribution from NSSS technical support.

02.05 Control Room Log. Review the control room log for the period from 48 hours before test initiation to test completion.

72592-03 INSPECTION GUIDANCE

03.01 Conformance to License Requirements (Prior to Start of Control Rod Withdrawal)

- a. Tabulation of technical specification limits and license conditions permits the inspector to familiarize himself with applicable plant requirements. This should normally be done before the inspection. Technical specification LCOs for Modes 4, 3, and 2 apply.
- b. Staffing requirements will be verified during rod withdrawal. Proper status of the emergency boration system should be verified by visual observation of valve positions, equipment start position switches, control room indications and record review. When selecting 40% of the applicable LCOs, the inspector should obtain a good cross-section of all LCO sections.
- c. Review surveillance records for all nuclear instrumentation channels. Review results of the signal-to-noise ratio test, and observe the individual count-rate indications.
- d. Witness trip test of the nuclear instrumentation channels.

03.02 Conformance to Administrative and Procedure Requirements

- a. On a sampling basis, the inspector should determine that personnel are familiar with procedural requirements, especially the limitations and precautions.
- b. On a sampling basis, the inspector should verify adherence to procedural limitations and precautions and the individual test steps.
- c. The inspector should verify that the procedural prerequisites and license conditions have been met. Verification should be performed by the inspector's review of the required records (valve lineup list, instrumentation calibration procedure, system checklist, or signoff item in the listed procedure) or by direct observation (monitoring instrumentation indications, valve positions, equipment start position, switches, or personnel actions).
- d. No guidance offered.
- e. No guidance offered.

03.03 Review of the "As-run" Procedure

- a. All test interruptions, changes, or corrections should be documented and reviewed by persons equivalent to those reviewing the original procedure.
- b. Deficiency reports should not only document the problem encountered, but also should indicate the resolution and its approval. Documentation of completed corrective action should also be included.
- c. Data sheet entries should be permanent (not pencil) and legible. All entries should be initialed or signed, and changes to recorded data should be made so that the original

entry remains legible and the reason for the change and the person making it are indicated. Missing data should be identified as a test deficiency and resolved accordingly.

03.04 Test Results Evaluation. No guidance offered.

03.05 Control Room Log. The control room log should be reviewed for indications of problems or deviations from the procedure, which may not have been adequately documented in the procedure.

END