

# NRC INSPECTION MANUAL

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## INSPECTION PROCEDURE 72400

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### OVERALL STARTUP TEST PROGRAM

#### PROGRAM APPLICABILITY:

#### 72400-01 INSPECTION OBJECTIVE

Ascertain whether the licensee has developed administrative controls which will assure that the startup test program will be prepared, performed and evaluated in accordance with regulatory requirements.

#### 72400-02 INSPECTION REQUIREMENTS

##### 02.01 Test Program

- a. Verify that the applicant has prepared a description of the startup test program. General areas of testing should be identified and assignment of responsibilities for test performance and results evaluation should be made for the following in accordance with license requirements and FSAR commitments:
  1. Core Loading
  2. Initial Criticality Test
  3. Low Power Tests
  4. Power Ascension Tests
- b. Verify that the applicant's test program includes requirements for testing consistent with FSAR commitments.
  1. Tests to be performed have been identified and sequenced.
  2. For each of the identified tests, the following information should have been identified:
    - (a) Test objectives
    - (b) Summary of the test
    - (c) Necessary prerequisites

(d) Acceptance criteria

3. Review the licensee's FSAR test program commitments and Reg. Guide 1.68 commitments and verify, by reviewing the test title and objective of the appropriate procedures, that the licensee has satisfied these commitments. Verify that the procedures which are not reviewed in the procedure Review Modules have received management approval in accordance with established licensee procedures.

c. Verify by review of administrative documentation that the applicant has specified the format and content of startup test procedures consistent with the guidance contained in Procedure 72300.

#### 02.02 Test Organization

a. Verify that the operating organization has been assigned overall control of all startup test activities.

b. Verify that the interface between test engineers and the operating organization are specified in writing.

c. Where interfaces exist between organizations involved in the test program, verify that organizational responsibilities are clearly established in writing.

#### 02.03 Test Program Administration

a. Verify that formal administrative measures have been established governing the conduct of testing including:

1. Method for verifying a test procedure is current prior to its use.

2. Methods to assure personnel involved in the conduct of a test are knowledgeable of the test procedures.

3. Methods to change (both major and minor) a test procedure during the conduct of testing.

4. Criteria for interruption of a test and continuation of an interrupted test.

5. Methods to coordinate the conduct of testing.

6. Methods to document significant events, unusual conditions, or interruptions to testing.

7. Methods for identifying deficiencies, documenting their resolutions, and documenting retesting.

b. Verify that formal methods have been established to control scheduling of test activities.

c. Verify that a formal program for evaluation of test results has been established. The program should provide for the following:

1. The test data are properly reduced to meaningful and understandable form.
2. The test results are checked and compared to previously determined performance standards or limits.
3. Deficiencies are clearly identified and appropriate corrective action is proposed, reviewed and completed.
4. After corrective actions or modifications have been completed, tests or portions of a test are rerun as necessary to assure that performance of the system is adequate.
5. The results of the evaluations are reviewed by appropriate licensee personnel and/or contractor personnel, including the person(s) responsible, for approving the original test procedures.
6. Management approval should be obtained prior to proceeding to the next power level for further testing.

02.04 Document Control

a. Test Procedures

1. Verify that formal administrative measures have been established which control the Test Procedure processes for review, approval and issuance.
2. Verify that formal administrative measures have been established which control revision of approved procedures. The controls should specify:
  - (a) Review by same persons and/or groups as the original procedure.
  - (b) Approval by same persons and/or groups as the original procedure.
  - (c) Issuance of revisions and control of obsolete procedures.
3. If operating procedures will be used during testing, the operating procedures must have been approved in accordance with the technical specifications.
4. Verify that responsibilities have been assigned in writing to insure that the procedure controls identified in (1) and (2) above will be implemented.

02.05 Test and Measurement Equipment

- a. Verify by review of administrative procedures that controls have been established for special test equipment that include:

1. A listing of controlled test equipment, the calibration requirements, and the calibration history.
  2. Controls for storage and issuance to preclude use of equipment which has not been calibrated within the specified interval.
  3. Requirements for recording test equipment identity and calibration date in test procedures to permit retest if equipment is subsequently found out of calibration.
- b. Select four pieces of test or measurement equipment and review the calibration records to verify that the above controls have been implemented.

72400-03 INSPECTION GUIDANCE

03.01 Test Program

- a. Regulation 10 CFR 50 requires the applicant to provide a description of the test program in the FSAR. Facility documents should implement the commitments for that program given in the FSAR. Guidance quoted in 10 CFR 50 should be interpreted to mean Regulatory Guide 1.68.
- b. The applicant should be able to demonstrate that the planned test program is consistent with FSAR commitments and Regulatory Guide 1.68. If it does not conform to FSAR commitments, the applicant must change the FSAR or bring the test program into conformance. Omissions, exceptions or proposed simulations in the test program that do not conform to Regulatory Guide 1.68 should be justified or brought to the attention of the LWRPB for evaluation and resolution with NRR. For each identified test, the objectives, major test steps, necessary prerequisites, and acceptance criteria should be identified so that the intent of the specified testing is clearly understood. This information may be included in the FSAR and referenced in appropriate test program documents.

Direct title comparison may not yield an exact match with the requirements of Regulatory Guide 1.68. Exceptions should be discussed with the licensee, and his intent established for each exception. If he does not intend to perform any tests identified in Regulatory Guide 1.68, even if the FSAR does not commit to that test, these exceptions shall be identified to the IE Light Water Reactor Programs Branch (LWRPB) for resolution with NRR.

- c. ANSI N18.7 and Regulatory Guide 1.68, Appendix C, provide guidance for the preparation of testing procedures. Section 14 of the FSAR should also describe the preparation of these procedures. Test program administrative procedures controlling preparation of test procedures should be consistent with this guidance and FSAR commitments.

03.02 Test Organization. Section 14 of the FSAR will normally specify the organizational requirements necessary to support the startup test program.

Where contractor/vendor personnel are participating in the test program, their responsibilities and qualifications should be specified. Interfaces and boundaries should be defined between the applicant's operations group and the startup organization. Some facilities use the assistance of various outside organizations to support startup testing in which case these working relationships should be defined in administrative procedures.

03.03 Test Program Administration

- a.(2) Methods to insure personnel are knowledgeable may include pre-test briefings and sign-off sheets.
- a.(3) Minor changes, which do not affect intent of the test procedure or acceptance criteria, may be made "on-the-spot" by appropriate test personnel, subject to subsequent review by the original approving body. Minor changes hence will not require the interruption of testing and are used to resolve items such as typographical errors, minor changes to sequence of test steps, etc. Major changes will require interruption of testing and the acceptance by the original approval body prior to the continuation of testing. The application should define major and minor changes in administrative documents. Conformance to technical specifications relating to procedure change control should be verified.
- a.(4) Criteria for stopping a test should be provided. Continuation of a test should not occur until prerequisites have been reestablished and documented in test notes, data sheets or logs.
- a.(6) Records should be maintained as part of each test (and retained). They should contain historical information relevant to the conduct of the test and document interruptions; equipment deficiencies identified; and reestablishment of prerequisites, valve lineups, etc.
- c. Refer to inspection procedure 72301 for guidance.

03.04 Document Control

- a.(1) Section 14 of the standard FSAR will normally describe the review, change and approval procedures for test procedures. The implementing instructions must provide the specific review and approval requirements for test procedures and test results to assure conformance with technical specification requirements.
- a.(2) A procedure for issuance of revised procedures and disposal of obsolete procedures must be sufficient to assure that all testing will be accomplished in

accordance with the most recently approved revision of the procedure.

If page changes to a procedure are issued, the applicant should have a cover sheet list of effective pages or other equivalent controls to enable the user of the procedure to account for the pages of the procedure by revision date, number or equivalent controls.

### 03.05 Test and Measurement Equipment

- a. Control of Test and Measurement Equipment. Section 17 of the FSAR and Section 6.8.1 of the Technical Specifications normally speak to measures appropriate for the control of test and measuring equipment. Section 5 of ANSI N18.7 and Appendix A of Regulatory Guide 1.33 provide guidance appropriate for control of test and measurement equipment. Control of test and measurement equipment during preoperational testing should be consistent with commitments and guidance contained in these documents.

1. There are two categories of measuring and test equipment in the plant: (1) installed equipment and (2) portable and laboratory equipment. This inspection section only speaks to portable and laboratory equipment which has safety significance in a nuclear plant. Test equipment in this category includes such items as gauges, digital voltmeters, oscilloscopes, pH meters, chemistry titration solutions, capacitance decade boxes and tools (e.g., torque wrenches and micrometers).

It is not intended that special calibration and control measures are needed for rulers, tape measures, levels and other similar-type devices where normal commercial practices provided adequate accuracy.

If test equipment that requires no calibration is in use, the licensee may identify it with a "No Calibration Required" sticker and establish appropriate administrative controls.

Unless unique calibration requirements are specifically required by the test procedures, normal process instrumentation should be excluded from this inspection since it will be calibrated as a part of the facility preventative maintenance program. If special calibration requirements are established, the program description should define necessary controls.

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