

# NRC INSPECTION MANUAL

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## INSPECTION PROCEDURE 70462

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### REACTOR COOLANT SYSTEM HYDROSTATIC TEST - TEST WITNESSING

PROGRAM APPLICABILITY: 2513

#### 70462-01 INSPECTION OBJECTIVES

01.01 Verify that the testing is conducted in accordance with approved procedures.

01.02 Verify the adequacy of test program records, including preliminary evaluation of test results.

#### 70462-02 INSPECTION REQUIREMENTS

02.01 Obtain an approved copy of the test procedure(s) before witnessing the test.

02.02 Overall Crew Performance.<sup>1</sup> Verify the following:

- a. The latest revision of the test procedure(s) is available and in use by all crew members.
- b. The minimum crew requirements are met.
- c. The test prerequisites are met (50% sampling of each item).
  1. Joints, including welded joints, are left uninsulated and exposed for examination during the test.
  2. The valve lineup/system checklists are complete.
  3. Water quality and temperature are as stated in the procedure(s).
  4. Properly calibrated pressure gauges of the required range are installed where required.
  5. Properly calibrated relief valves of the required setpoint and capacity are installed where required.

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<sup>1</sup> Satisfies inspection requirements of IP 71302-02.03a, b, and d.  
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- d. Verify that pump and valve hydrostatic test requirements were either met on a shop hydrostatic test or during a field hydrostatic test.
- e. Proper plant systems are in service (50% sampling).
- f. Special test equipment required by the procedure is calibrated and in service.
- g. Test is performed as required by the approved procedure.
- h. Criteria for interruption of testing and continuation of an interrupted test are adhered to.
- i. Significant events, unusual conditions, test discrepancies or interruptions to testing are documented.
- j. Crew actions are correct and timely during the performance of the test. Adequate coordination exists among crew members to conduct the test properly.
- k. All data are collected by the proper personnel.
- l. Temporary modifications such as jumpers, strainers, spool pieces, or blank flanges are installed and tracked per established administrative controls.
- m. The post-test valve lineup/system checklists are complete.

02.03 Independently verify that overall test acceptance criteria have been met by:

- a. visually examining 10% of all joints, connections, and regions of high stress, such as regions around openings and thickness transition sections.
- b. visually examining 20% of the pumps and valves located within the test boundaries.
- c. verifying that leakage from temporary seals or leakage permitted by the design specification is being directed away from the surface of the component to avoid masking leaks from other joints.
- d. after the hydrostatic test of a vessel, observing the licensee's examination of at least two weld joints and two heat-affected zones of Categories A, B, C, and D, used to join ferritic material and repair welds in ferritic material that exceed in depth either 3/8 in. (10 mm) or 10% of section thickness, whichever is less, by the magnetic particle test or liquid penetrant method.

02.04 Review the preliminary test results to assure that licensee's preliminary test evaluation is consistent with inspector's observations.

02.05 Review all test deficiencies, their resolution, and retest. Verify that all are reviewed by appropriate management.

02.06 Review data sheet entries for legibility, traceability, and permanence.

02.07 Design Change Control<sup>2</sup>

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<sup>2</sup> Satisfies inspection requirements of IP 70302-02.04.

- a. Review the design change package(s) for the selected system since turnover to determine that reviews, processing, and implementation were performed according to procedural controls.
- b. For modification review in 02.07a, verify that the appropriate changes were made to test procedures.
- c. For design changes reviewed in 02.07a, verify that the cognizant engineer is or will be aware of the change.

02.08 Document Control<sup>3</sup>

- a. Verify that procedure review and approval were in accordance with administrative controls.
- b. Examine selected drawings and vendors' manuals which are being used by test personnel and verify that they are current issues.
- c. Select one field-changed drawing, if applicable, and verify that the change was referred to the design engineer for review and revision of drawings.

02.09 Training.<sup>4</sup> Verify by review of training records or direct interview of two responsible test personnel that they have received the required training. This training should include the following:

- a. administrative controls for testing
- b. QA/QC indoctrination
- c. technical training as appropriate

70462-03 INSPECTION GUIDANCE

General. The inspector is required to witness, on a sampling basis, the overall conduct of the preoperational test program. This includes the witnessing of those tests and activities covered by this procedure and other tests included in the licensee's procedure at the inspector's option. Communications must be maintained between the inspector and the licensee so that the licensee's test dates are known far enough in advance for the inspector to be on site to witness the tests. Licensees are not expected, nor should they be requested, to delay conduct of a test pending arrival of the inspector.

The inspector should review the test procedures and the overall test sequencing document (or procedure) before test performance. It is not expected that these reviews be thorough relative to those reviews performed in accordance with IP 70362. The intent of these reviews is primarily to familiarize the inspector with the licensee's test program and requirements and secondarily for identification of major test deficiencies, if present, which could otherwise go undetected because of sampling requirements in the referenced procedures.

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<sup>3</sup> Satisfies inspection requirements of IP 70302-02.03.

<sup>4</sup> Satisfies inspection requirements of IP 70302-02.06.

## Specific Guidance<sup>5</sup>

03.02a The inspector should determine the proper procedure revision by examination of the licensee's master index or the "up-to-date" procedure file. Ensure by examination and discussions that crew members are using the procedure with proper revision number and are familiar with the procedural requirements, especially the limitations and precautions.

03.02b The test procedure will normally specify minimum crew requirements. The inspector should ensure that the requirements are met.

03.02c4 All pressure test gauges should be calibrated against a standard dead weight tester or a calibrated master gauge. The test gauges should be calibrated before each test or series of tests. A series of tests is that group of tests using the same pressure test gauge or gauges which is conducted at the same site within a period not exceeding two weeks.

Pressure test gauges used in pressure testing should be directly connected to the system. If the primary indicating gauge is not readily visible to the operator controlling the pressure applied, an additional indicating gauge should be provided where it will be visible to the operator for the duration of the test.

Indicating pressure gauges should be graduated over a range not less than 1-1/2 times the test pressure nor more than 4 times the test pressure.

03.02c5 The pressure relief valves should have a capacity greater than the capacity of the test fill system. Pressure relief valves should be set so that the maximum system pressure will not exceed the maximum hydrostatic test pressure specified by ASME Boiler and Pressure Vessel Code, Section III, Division 1, Subsection NB-3226. The pressure relief valves should have been calibrated within the time requirements specified by the licensee's administrative controls.

03.03 The only leakage permitted is the leakage of temporary seals and gaskets, installed for the purpose of conducting the hydrostatic test and which will be replaced later. Other leaks, such as those from permanent seal, seats, and gasketed joints in components may be permitted when specifically allowed by the design specifications.

03.05 Refer to inspection procedures on welding, destructive examination, etc. in IE 2512 for specific guidance on test deficiencies, their resolution, and retest as appropriate.

03.08 Recent changes (i.e., these completed during the past 3 to 6 months) may not be reflected in formally revised as-built drawings. However, the inspector should expect to locate, at the site, official marked-up or working copies of as-built drawings which would reflect all of the latest changes or modifications. The procedure for revision of drawings to accommodate field changes should also be verified to be functioning to ensure "as-built" conformance.

03.09 ANSI 45.2.6 N45.2.6-1978, which is endorsed by Regulatory Guide 1.58, requires that qualification records, including training received, shall be kept for personnel involved in inspection, examination, or testing, including preoperational testing.

## 70462-04 REFERENCES

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<sup>5</sup> The digits following the "03" numbers in this section refer to the equivalent digits following the "02" numbers in Section 70462-02, "Inspection Requirement." For example, Section 03.02a offers guidance for Inspection Requirement 02.02a.

10 CFR 50.2(V)

R.G. 1.68, Revision 2 (August 1978), Appendix A

ASME Boiler and Pressure Vessel Code, Section III, Division 1 - Subsection NB

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