
**Space systems — Program
management — Test reviews**

Systèmes spatiaux — Management de programme — Revue d'essais

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 14, *Space systems and operations*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

Space products are complicated, but need to work reliably in space. Tests on the ground which simulate the space environment are complicated as well, but help to confirm the readiness status of equipment. Evaluation after testing confirms the effectiveness of test data and is very important to ensure the achievement of test objectives. Test reviews are effective management tools to ensure the test is successful on the first attempt, and these are composed of three types of reviews:

- Test Readiness Review (TRR);
- Post Test Review (PTR);
- Test Review Board (TRB).

TRRs, PTRs and TRBs are necessary especially for system tests and complicated tests. Sometimes, the PTR and TRB can be combined, and TRRs for several tests can also be combined.

This document provides the requirements for organizing and performing test reviews which include management for test reviews, processes for test reviews, content of test reviews, and implementation for test reviews. In addition, this document provides common set requirements for test reviews which will encourage international space co-operation and reduce the costs of planning and performing test reviews.

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Space systems — Program management — Test reviews

1 Scope

This document defines procedures, contents and requirements for test reviews which are composed of the Test Readiness Review (TRR), Post Test Review (PTR) and Test Review Board (TRB).

This document is applicable to tests of space systems and space products, including environment tests and functional and performance tests, especially for system level tests and complicated tests.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10795, *Space systems — Programme management and quality — Vocabulary*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10795 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/5bc-9b8bec02bd9f/iso-22137-2020>

3.1.1

milestone

designated project status that indicates the amount of progress made toward project completion, or that should be achieved before the project proceeds to a new phase

[SOURCE: ISO 21349:2007, 3.2]

3.1.2

milestone criteria

observable facts that indicate a milestone has been reached

[SOURCE: ISO 21349:2007, 3.3]

3.1.3

review board

body, organized into sub-entities, as necessary, consisting of a chairperson or delegated person and members, charged with evaluating the evidence of project status, along with identifying issues and necessary corrective actions, to determine that the objectives and success criteria of a review milestone have been met

Note 1 to entry: The purpose of the review board is to prepare an objective evaluation of the project status. Achievement of an objective evaluation is aided by use of independent experts who have no prior association with the project and no personal conflict of interest with respect to the outcome of the review.

ISO 22137:2020(E)

[SOURCE: ISO 21349:2007, 3.8, modified — duplication of "review board" within definition has been removed]

3.1.4

review policy

policy that provides either requirements or guidance (or both) for the overall conduct of the review

[SOURCE: ISO 21349:2007, 3.11]

3.1.5

test block

aggregation of several tests grouped by discipline

Note 1 to entry: Typical test blocks for space segment elements are (not all):

- integration;
- leak pressure;
- EMC conducted;
- thermal;
- functional and performance test.

3.2 Abbreviated terms

AIT Assembly, Integration and Test

AITP Assembly, Integration and Test Plan

EMC Electromagnetic Compatibility

EGSE Electrical Ground Support Equipment

GSE Ground Support Equipment

KIP Key Inspection Point

MGSE Mechanical Ground Support Equipment

MIP Mandatory Inspection Point

NCR Non-conformance Report

PTR Post Test Review

TRB Test Review Board

TRR Test Readiness Review

4 Management requirements for test reviews

4.1 Purpose of test reviews

Test reviews are a series of formal reviews to determine the suitability, adequacy and effectiveness of test readiness, test procedures and test results as the milestone of starting the test or declaring the test completed formally.

Test reviews shall conclude the following formal reviews:

- a) Test Readiness Review (TRR): Before the start of test activity, a TRR shall be held to verify that all conditions allow the test to proceed.
- b) Post-Test Review (PTR): A PTR shall be held in order to formally declare the test completed and allow the release of the item under test and test facility for further activities.
- c) Test Review Board (TRB): A TRB shall be held to review all results and conclude on test completeness and achievement of objectives.

The purpose of test reviews is to implement effective test management for the project. TRR, PTR and TRB can ensure that execution of the test programme and delivery of the test results meet the requirements of the customer and the project.

4.2 Test reviews point

Test reviews start at the end of the production phase and are implemented at the stage of AIT. Completeness of the TRR is the milestone of the start-up test, and completeness of the PTR and TRB are the milestones of the concluding test.

4.3 Organization of test reviews

Test reviews are organized by the supplier. According to programme management requirements, customers should participate in some test review meetings.

- a) The following parties shall participate or check the implementation process of TRR and confirm its results:
 - 1) the chairperson, who is the product assurance manager of the authority responsible for the test;
 - 2) product assurances from all involved parties;
 - 3) project engineers from all involved parties;
 - 4) test director;
 - 5) AIT representatives from all involved parties;
 - 6) specialists, when necessary from all involved parties;
 - 7) facility representatives;
 - 8) others as relevant.
- b) The following parties shall participate or check the implementation process of PTR and confirm its results:
 - 1) the chairperson, who is the test director;
 - 2) project engineers;
 - 3) AIT representatives;
 - 4) facility representatives;
 - 5) others, including specialists, as relevant.
- c) The following parties shall participate or check the implementation process of TRB and confirm its results:
 - 1) the chairperson, who is the director of the authority responsible for project technology;

- 2) project engineers;
- 3) AIT representatives;
- 4) facility representatives;
- 5) others, include specialists, as relevant.

4.4 Documentation of test reviews

Before the test review, the supplier shall develop and prepare test review documents according to customer requirements.

Prior to the TRR, the supplier should develop a test readiness checklist and/or a TRR report, and should prepare relevant documents used to implement tests according to [6.1.2](#). For system level tests and large-scale tests, a TRR report is needed, such as for the EMC tests of spacecraft. However, a TRR checklist can replace a TRR report for subsystem tests and a product level test. [Annex A](#) provides an example of a test readiness checklist. [Annex B](#) provides example contents of a TRR report. Prior to the PTR, the supplier should prepare test data according to customer requirements. Prior to the TRB, the supplier should develop a test report according to ISO 17566.

5 Process for test reviews

5.1 Test review procedures

A TRR shall be implemented before a test. When the test is completed, a PTR shall be implemented, following which, based on the summary of the test activity, a TRB shall be implemented. For the procedures of a test review see [Figure 1](#).

- a) The process of a TRR should comprise 4 steps:
 - 1) Step 1: "initiate process" of the TRR;
 - 2) Step 2: "check process" of the TRR on the spot;
 - 3) Step 3: implement a "review process" of the TRR;
 - 4) Step 4: "conclude process" of the TRR.
- b) The process of a PTR should comprise 3 steps:
 - 1) Step 1: "initiate process" of the PTR;
 - 2) Step 2: implement a "review process" of the PTR;
 - 3) Step 3: "conclude process" of the PTR.
- c) The process of a TRB should comprise 3 steps:
 - 1) Step 1: "initiate process" of the TRB;
 - 2) Step 2: implement a "review process" of the TRB;
 - 3) Step 3: "conclude process" of the TRB.