TECHNICAL REPORT

ISO/TR 17400

Second edition
2021-08

Space systems — Space launch complexes, integration sites and other facilities — General testing guidelines

Systèmes spatiaux — Complexes de lancement spatial, sites d'intégration et autres installations — Lignes directrices pour les essais

Reference number
ISO/TR 17400:2021(E)

© ISO 2021



COPYRIGHT PROTECTED DOCUMENT

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

© ISO 2021 – All rights reserved

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 General characteristics **2**
5 Testing and acceptance phases and goals for launch pad and integration site **5**
5.1 Testing phases 5
5.2 Acceptance phases 5
5.3 Facility testing and acceptance 5
5.4 Main system factory testing 5
5.5 Main system field testing 6
5.6 Launch pad and integration site end-to-end testing 6
6 General characteristics for testing and acceptance **7**
6.1 General considerations 7
6.2 Test and acceptance procedure 7
6.3 Main system factory testing 8
6.4 Main system field testing 10
6.5 Acceptance of the main system and facility after field test 13
6.6 Launch pad and integration site end-to-end testing 15
6.7 Launch pad or integration site acceptance after end-to-end testing 18
7 Main system and facility modifications **20**
Bibliography **23**

© ISO 2021 – All rights reserved

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*.

This second edition cancels and replaces the first edition (ISO/TR 17400:2003), which has been technically revised.

The main changes compared to the previous edition are as follows:

— in the document all recommendations (“should”) were replaced by other verbs (“is”, “are”), all permissions (“may”) were replaced by “can”;

— the term “main system” was updated;

— 3.1, 5.5, 6.3.3, 6.6.5, 6.6.8 were specified according to comments and proposals of the subcommittee experts.

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.

© ISO 2021 – All rights reserved

Introduction

The purpose of this document is describing the uniform practices for organizing the tests and promoting verification of all parameters and characteristics of various launch complexes. It is necessary to define the functions and to coordinate the activities of all the test participants, namely, the developers of complexes and systems, the manufacturers of systems and equipment, the organizers of tests, the customer, and others.

This document describes test activities and lists who will be responsible for the testing at launch pad and integration sites for launch vehicle and spacecraft.

© ISO 2021 – All rights reserved

Space systems — Space launch complexes, integration sites and other facilities — General testing guidelines

1 Scope

This document is applicable to new projects and programs and to redesigned and upgraded launch pad and integration sites. This document describes the testing phases, goals, and general aspects for launch space complexes and complexes for assembly and tests of a vehicle and spacecraft and the associated equipment that, after successful testing, will be ready for launch vehicle processing and launch. This document can be applied to the creation of international launch pad and integration sites. At creation of new launching space complexes and complexes for assembly and tests of a vehicle and spacecraft (or at their modernization) within the framework of one country, the rules established by that country can be applied.

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 9000, *Quality management systems — Fundamentals and vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9000 and the following apply.

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

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

— IEC Electropedia: available at https://www.electropedia.org/

3.1
integration site
equipment and facility designed for launch vehicle storage, assembly and testing, and launch vehicle (space rocket) and spacecraft/payload(s) integration, post-integration testing, and launch preparation, maintenance, servicing and preparation for transportation to the *launch pad* (3.3)

3.2
international launch pad and integration sites
land, ground/airborne/marine facilities, equipment, utilities, and infrastructure, created with the cooperation of several countries or the entities that belong to more than one country, necessary for the launch operations of launch vehicle and payload and for in-flight operations during the launch phase

3.3
launch pad
equipment and facility designed to provide for the pre-launch and launch operations of spacecraft

3.4
end-to-end testing
launch pad (3.3) or *integration site* (3.1) development phase including the testing and evaluation of its overall readiness to support a launch vehicle and a spacecraft

© ISO 2021 – All rights reserved

3.5
support system
integral part of the launch complex or *integration site* (3.1), which ensures the functioning of technological units (systems) and the conditions of normal life of the operating personnel

3.6
main system
constituent part of *launch pad* (3.3) or constituent part of *integration site* (3.1) primarily responsible for providing preparation and launch of a launch vehicle or spacecraft

3.7
main system factory testing
launch pad (3.3) or *integration site* (3.1) development phase that includes the testing of a completely assembled and checked out *main system* (3.6) to determine its operational readiness to be shipped to the operational launch pad or integration site for further testing or operation

3.8
main system field testing
launch pad (3.3) or *integration site* (3.1) development phase including the testing of an assembled, fully equipped, and checked out (or factory tested) *main system* (3.6), which is conducted at the operational launch pad or integration site to determine the system readiness for further testing or operation

3.9
test supervision team
acceptance team
group of experts formed by the customer (organization, company, etc.) with the goal of coordinating work during specific testing or acceptance phases

4 General characteristics

4.1 Testing of launch pad and integration sites and the main systems is conducted in accordance with the regulatory and design documentation specifications.

4.2 The test supervision team coordinates use of the launch pad and integration site and the system testing process and work management.

4.3 The launch pad and integration site developer provides technical management during the launch pad and integration site and system testing.

4.4 Appointments to test supervision and acceptance team are determined according to company or agency recommendations before the beginning of a related testing phase.

Customer representatives participate in team activities and sign respective documents in the event the representatives are employees of the company or agency.

4.5 As an option, customer representatives, participating in the testing, work in a joint control and acceptance group (JCAG). JCAG functions are determined in agreements developed by the customer.

4.6 The system testing and acceptance team has the authority to convene representatives of design and unit manufacturing organizations. These representatives are involved in:

— factory testing (the system manufacturing organization);

— field testing (the test organization);

— end-to-end testing (the team chairman).

© ISO 2021 – All rights reserved