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**Space systems — General  
management requirements for space  
test centres**

*Systèmes spatiaux — Exigences générales de management pour les  
centres d'essais spatiaux*

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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](http://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](http://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 on 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 the following URL: [www.iso.org/iso/foreword.html](http://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*.

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## 0 Introduction

### 0.1 General

This document provides the minimum requirements to demonstrate the competence of the test centres working for space projects.

This document also incorporates requirements from ISO/IEC 17025 that are considered applicable for space test centres.

In a specific context, the requirements defined in this document may be tailored to match the requirements of this context.

### 0.2 Nomenclature/formal verbs

To understand the verbal forms and expressions of provisions in this document, please consult [Clause 7](#) of the ISO/IEC Directives Part 2.

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# Space systems — General management requirements for space test centres

## 1 Scope

This document specifies requirements for when a space test centre needs to demonstrate its competence to consistently provide space testing that meets customer requirements.

It specifies requirements for space test centres, applicable to the test process, test personnel (both, of the customer and the space test centre), test facilities, test environment and any operations related to the test item under responsibility of the space test centre as requested by the customer.

This document also defines the requirements for space testing and the development of test facilities.

This document was originally prepared with a focus on environmental testing (i.e. thermal vacuum, vibrations, acoustic, Electromagnetic Compatibility (EMC), Radio Frequency (RF), physical properties measurements, etc.).

This document applies to space test centres as self-standing organizations, or those belonging to a parent organization. This document has been prepared for organizations providing test services for space and launch segment elements and subsystems.

## 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 10794, *Space systems — Programme management — Material, mechanical parts and processes*

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

ISO 14300-2, *Space systems — Programme management — Part 2: Product assurance*

ISO 14620-1, *Space systems — Safety requirements — Part 1: System safety*

ISO 15388, *Space systems — Contamination and cleanliness control*

ISO 15864, *Space systems — General test methods for space craft, subsystems and units*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

ISO 17566, *Space systems — General test documentation*

ISO 17666, *Space systems — Risk management*

ISO 23460, *Space projects — Programme management — Dependability assurance requirements*

ISO 23461, *Space systems — Programme management — Non-conformance control system*

ISO 27025, *Space systems — Programme management — Quality assurance requirements*

## 3 Terms and definitions

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

## ISO 18322:2017(E)

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/>

### 3.1 critical operation

operation that can result in injury to persons, significant material damage or other unacceptable consequences if not properly performed

### 3.2 modification

change in the configuration of an existing test facility

Note 1 to entry: In the context of a test facility.

### 3.3 quality representative

representative from the space test centre management with designated responsibility for quality management

Note 1 to entry: In the context of test centres.

### 3.4 safety policy

overall intentions and directions of the space test centre with regard to safety as formally expressed by executive management

### 3.5 safety representative

representative from the space test centre management with designated responsibility for safety

Note 1 to entry: In the context of test centres.

### 3.6 space test

environmental test that is applied to space items using space centres facilities

### 3.7 space test centre

complete entity including the organization which provides, maintains, develops and operates test facilities for space project and applications including accompanied services

### 3.8 test campaign

series of test processes starting with the arrival of the test specimen in the space test centre and ending with its departure from the space test centre

Note 1 to entry: In the context of test centres.

### 3.9 test facility

technical plant to provide specific simulated conditions for testing equipment for space projects and applications, including test connections and instrumentation attached as necessary to perform the test

Note 1 to entry: Test facility includes test equipment and associated infrastructure, including supplies.

### 3.10 test personnel

staff developing, maintaining or operating a test process



**3.11****test process**

set of activities necessary to perform a test, or a series of tests, to comply with the requirements specified in the business agreement

Note 1 to entry: This includes, but is not limited to, test design, planning, preparation, acceptance, performance, reporting, reviewing and recording.

**3.12****test specimen**

spacecraft, subsystem, item or device under test

Note 1 to entry: This term is a synonym of test article and test item.

**4 Abbreviated terms**

The following abbreviated terms are defined and used in this document:

DRD document requirements definition

ESD electrostatic discharge

FRR facility readiness review

GSE ground support equipment

NCR non-conformance report

PTR post-test review

QA quality assurance

TRR test readiness review

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**5 Space test centre management principles****5.1 Objective**

The objective is to ensure that all technical and programmatic risks associated with the testing of space products performed under the responsibility of the space test centre are adequately managed through the implementation of an effective management program.

**5.2 General principles**

The space test centre is responsible for demonstrating that a management programme covering the definition, design, development, implementation and continuous improvement, of competences, processes and facilities, is established, implemented and maintained throughout the test service provision to a customer.

The basic principles of the space test centre management programme are the early identification of aspects potentially detrimental for the quality of the test service, the safety of persons and products, and the cost-effective prevention of any adverse consequence of such aspects.

The management programme shall demonstrate the integration of activities from the following disciplines:

## ISO 18322:2017(E)

ISO 10794	<i>Space systems — Programme management — Material, mechanical parts and processes</i>
ISO 14300-2	<i>Space systems — Product assurance — Policy and principles</i>
ISO 14620-1	<i>Space systems — Safety requirements — Part -1: System safety</i>
ISO 17666	<i>Space systems — Risk management</i>
ISO 23460	<i>Space projects — Programme management — Dependability assurance requirements</i>
ISO 23461	<i>Space systems — Programme management — Non-conformance control system</i>
ISO 27025	<i>Space systems — Programme management — Quality Assurance requirements</i>

## 6 Management requirements

### 6.1 General requirements

- a) The space test centre shall establish, document, implement and maintain a management system and continually improve its effectiveness.
- b) The space test centre shall specify criteria and methods to demonstrate that both the operation and control of management process are effective.
- c) The space test centre shall demonstrate the availability of resources and information to support the operation and monitoring of management processes.
- d) The space test centre shall monitor, measure, and analyse management processes.
- e) The space test centre shall implement actions to achieve planned results and continual improvement of management processes.
- f) The management process of the space test centre, or its parent organization, shall be implemented and maintained to allow external and internal revisions or audits by customer or external authorities, ensuring due customers confidentiality.
- g) If the space test centre is part of an organization performing activities other than testing, the responsibilities of key personnel in the organization that have an involvement on the testing activities of the space test centre shall be specified to identify potential conflicts of interest.
- h) The space test centre shall ensure that non-space related activities have no detrimental effect over the activities carried out in the space test centre.

NOTE For example, non-space related activities include infrastructure works or testing performed for other industrial sector.

### 6.2 Documentation, records and data control

#### 6.2.1 General

- a) The space test centre shall establish and maintain a documented information and records control system.
- b) The space test centre shall establish and maintain a system for the identification, storage, protection, retrieval, retention and disposition of test data.

### 6.2.2 Facility description

- a) The space test centre shall establish and maintain a documented description of each test facilities and associated infrastructure, including as a minimum:
  - 1) functional performance;
  - 2) general arrangement drawing;
  - 3) interface definition.
- b) The facility description shall be provided to the customer upon request.

## 6.3 Management responsibility

### 6.3.1 Organization

The space test centre shall define its organization and management structure, its place in the parent organization, and the relationships among management, technical operations, support services and the quality and safety management system.

### 6.3.2 Planning

The space test centre shall plan the following tasks:

- a) the preparation of project and quality plans for critical processes;
- b) the identification of controls, (processes, equipment, fixtures, resources and skills);
- c) the update of quality control, inspection and verification techniques, including the development of new instrumentation or complex facilities;
- d) the development of their capability for any test requirements that exceed the current known state of the art;
- e) the identification of standards for maintenance and calibration of items used by the space test centre;
- f) the establishment and follow-up of rules to control conformity to requirements between design and acceptance of space test centre items;
- g) the assessment of risks related to customer-supplied products and the applicable processes.

### 6.3.3 Responsibility and authority

- a) Top management shall ensure that management and technical responsibilities and authorities are defined and communicated within the organization.
- b) Management and technical responsibilities and authorities shall be delegated in case of personnel absence, and defined and communicated within the organization.
- c) Top management shall ensure that space test centre personnel are free from undue pressures, conflict of interest or influences that can affect the quality of their work.

### 6.3.4 Quality and safety representatives

- a) Top management shall appoint a quality representative with defined authority to:
  - 1) ensure that the quality management system is established, implemented and maintained;
  - 2) report its performance to the space test centre management and any needs for improvement; and

- 3) ensure quality assurance awareness throughout the space test centre.
- b) Top management shall appoint a safety representative with defined authority to:
  - 1) ensure that safety processes for the space test centre are established, implemented and maintained;
  - 2) report to top management on the performance of safety in the space test centre and any need for improvement; and
  - 3) ensure safety assurance awareness throughout the space test centre.
- c) In case personnel safety, test specimens or test facilities are at risk, the safety representative, or designated trained staff, shall have defined authority to stop the activity.

## 7 Resource management

### 7.1 General

- a) The space test centre shall train all personnel to make them competent and qualified to perform their assigned tasks.
- b) The space test centre shall ensure that all personnel are trained to comply with the applicable safety requirements.
- c) The space test centre shall ensure that personnel undergoing on-the-job training are subject to supervision by a person competent to perform such task.
- d) Where contracted and additional technical and key personnel are used, the space test centre shall demonstrate that such personnel are competent and that they work in conformance with the management system. <https://standards.iteh.ai/catalog/standards/sist/77a4ca03-bf08-48ae-88c7-150af36e0515/iso-18322-2017>
- e) All space test centre personnel conducting or supporting potentially hazardous operations shall receive specific safety training, including the preventive measures to be taken.

### 7.2 Competence, awareness and training

- a) The space test centre shall specify and maintain job descriptions for managerial and technical personnel involved in the operations.
- b) The space test centre shall identify the required competence and authorization to perform test processes and test facility related activities.
- c) The space test centre shall identify the available competence and the training needs to reach the required competence and authorization.
- d) The space test centre shall establish and implement criteria for managing the competences and the authorization to perform activities.
- e) The identification of the competence and training objectives for the space test centre personnel shall be carried out on a periodic basis.
- f) The identification of training needs shall include training for personnel being reassigned to jobs other than those for which they were originally trained.
- g) The space test centre shall evaluate the effectiveness of the training performed.
- h) Space test centre and customer personnel performing selected handling operations, lifting and hoisting operations shall be trained and authorized after competence verification. The space test centre shall maintain a list of authorized operators.