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**Space systems — Programme management — Product  
~~Quality~~ **quality** assurance requirements**

~~Systèmes spatiaux — Management de programme — Exigences pour assurance qualité~~

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**Contents—Page**

Foreword .....	ix
Introduction.....	x
1 Scope .....	1
2 Normative references.....	1
3 Terms, definitions and abbreviated terms .....	1
3.1 Terms and definitions .....	1
3.2 Abbreviated terms.....	2
4 QA programme management.....	3
4.1 QA programme.....	3
4.2 Organization.....	4
4.3 QA programme plan.....	4
4.4 QA status reporting.....	4
4.5 Personnel training and certification .....	4
4.6 QA programme audits.....	4
4.7 QA role in configuration management.....	5
4.8 Critical items control .....	5
5 Quality assurance general requirements .....	6
5.1 Documentation and data control.....	6
5.2 Records.....	6
5.3 Stamp control .....	7
5.4 Traceability.....	7
5.4.1 General.....	7
5.4.2 Identification.....	7
5.4.3 Data retrieval system.....	8
5.5 Metrology and calibration .....	9
5.6 Nonconformity control system .....	10
5.7 Alert system .....	11
5.7.1 Supplier participation .....	11
5.7.2 PA experts involvement .....	11
5.7.3 Generation of alerts within the project.....	11
5.7.4 Processing of alerts from other sources .....	12
5.8 Handling, storage and preservation.....	12
5.8.1 Handling.....	12
5.8.2 Storage.....	12
5.8.3 Preservation.....	13
5.9 Statistical quality control and analysis .....	13
5.9.1 General.....	13
5.9.2 Sampling plans .....	13

**ISO/FDIS 27025:2023(E)**

6	QA requirements for design and verification .....	13
6.1	General .....	13
6.2	Planning .....	14
6.3	Organizational and technical interfaces .....	14
6.4	Design rules .....	15
6.4.1	General.....	15
6.4.2	Producibility.....	15
6.4.3	Repeatability .....	15
6.4.4	Inspectability and testability.....	16
6.4.5	Operability .....	16
6.5	Standards and procedures .....	16
6.5.1	General.....	16
6.5.2	Provisions.....	16
6.6	Verification .....	17
6.6.1	General.....	17
6.6.2	Design verification analysis .....	17
6.6.3	Design reviews .....	18
6.6.4	Qualification process .....	18
6.7	Design changes.....	19
7	QA requirements for procurement.....	19
7.1	General .....	19
7.2	Selection of procurement sources .....	20
7.2.1	General.....	20
7.2.2	Selection criteria.....	20
7.2.3	Record and list of procurement sources.....	20
7.3	Procurement documents .....	20
7.3.1	General.....	20
7.3.2	Procurement documents.....	21
7.3.3	Review of procurement documents .....	21
7.3.4	Product assurance documentation to deliver .....	21
7.4	Surveillance of procurement sources .....	21
7.4.1	General.....	21
7.4.2	Surveillance programme.....	21
7.4.3	Criteria for surveillance.....	21
7.4.4	Surveillance of lower level suppliers .....	22
7.5	Receiving inspection.....	22
7.5.1	General.....	22
7.5.2	Receiving inspection activities .....	22
7.5.3	Customer furnished items .....	23
7.5.4	Receiving inspection records .....	23

8	QA requirements for manufacturing, assembly and integration .....	23
8.1	General .....	23
8.2	Planning of manufacturing, assembly and integration activities and associated documents.....	23
8.3	Manufacturing readiness reviews.....	25
8.3.1	General.....	25
8.3.2	Objectives .....	25
8.4	Control of processes.....	25
8.4.1	General.....	25
8.4.2	Critical processes .....	25
8.4.3	Statistical process control.....	26
8.5	Workmanship standards .....	26
8.5.1	General.....	26
8.5.2	Identification of criteria.....	26
8.5.3	Samples .....	26
8.6	Materials and parts control.....	26
8.6.1	General.....	26
8.6.2	Items marks.....	26
8.6.3	Sensitive items.....	26
8.7	Equipment control.....	26
8.7.1	Tools .....	26
8.7.2	Equipment for computer-aided manufacturing .....	27
8.8	Cleanliness and contamination control .....	27
8.8.1	General.....	27
8.8.2	Cleanliness levels .....	27
8.8.3	Cleaning materials and methods .....	27
8.8.4	Contamination control .....	27
8.8.5	Cleanliness of facilities.....	28
8.9	Inspection.....	28
8.9.1	General.....	28
8.9.2	Critical characteristics.....	28
8.9.3	Self-inspection.....	28
8.9.4	Mandatory inspection points (MIPs) .....	28
8.9.5	MIPs agreement.....	28
8.9.6	MIPs selection.....	28
8.9.7	MIPs invitation .....	29
8.9.8	Inspection and tests status identification.....	29
8.10	Specific requirements for assembly and integration .....	29
8.11	Manufacturing, assembly and integration records .....	30
9	Testing .....	30
9.1	General .....	30

**ISO/FDIS 27025:2023(E)**

9.2	Test facilities .....	30
9.3	Test equipment .....	30
9.3.1	General .....	30
9.3.2	Verification of test equipment .....	30
9.4	Test documentation .....	30
9.4.1	Test procedures .....	30
9.4.2	Test reports .....	31
9.5	Test performance monitoring .....	31
9.5.1	General .....	31
9.5.2	Test witnessing .....	31
9.5.3	Test of critical characteristics .....	31
9.5.4	Self-certification for test activities .....	31
9.5.5	Testing activities subject to QA certification .....	32
9.5.6	Testing of hazardous operations .....	32
9.5.7	QA authority .....	32
9.6	Test reviews .....	32
9.6.1	General .....	32
9.6.2	QA function representation .....	32
10	QA requirements for acceptance and delivery .....	32
11	Operations .....	34
11.1	General .....	34
11.2	Basic quality concepts for operations .....	35
11.2.1	Mission quality .....	35
11.2.2	Quality of mission products and services .....	35
11.3	Validation of the system .....	35
11.4	QA requirements .....	36
11.4.1	QA plan for operations .....	36
11.4.2	Operations planning .....	36
11.4.3	Operational demonstration .....	36
11.4.4	Training and operator certification .....	37
11.4.5	Operations anomalies and feedback corrective loop .....	37
11.4.6	Alerts .....	37
11.4.7	Procedural deviations .....	38
11.4.8	General requirements .....	38
Annex A (informative)	Ground support equipment (GSE) .....	39
Annex B (informative)	Logbook — Document requirements definition .....	42
Annex C (informative)	End item data package — Document requirements definition .....	47
Annex D (informative)	Declaration of conformity — Document requirements definition .....	54
Bibliography	.....	58

## 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 a patent rights in respect thereof. ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights. ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). 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).~~

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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](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*.

This second edition cancels and replaces the first edition (ISO 27025:2010), which has been technically revised.

The main changes are as follows:

- updated the normative references in ~~Clause 2~~ **Clause 2**;
- updated the terms and definitions references in ~~Clause 3~~ **Clause 3**.

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](http://www.iso.org/members.html).

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## Introduction

This document is intended to be applied for the management of product quality assurance in space programmes and applications.

The formulation of this document takes into account the existing International Standards prepared by ISO/TC 176 (notably ISO 9000 and ISO 10006) and the content of ISO 14300-1 and ISO 14300-2.

The requirements of this document and its associated referenced standards are tailored to the needs and classes of specific projects.

When viewed from the perspective of a specific project context, the requirements defined in this document are tailored to match the genuine requirements of a particular profile and circumstances of a project.

For programme management, and as required in ISO 14300-2, the following concepts apply.

- The objective of quality assurance is to provide adequate confidence to the customer that the end product or service satisfies the requirements.
- The quality assurance policy is to ensure, in conjunction with other integrated project and product assurance functions, that required quality is specified, designed-in and will be incorporated, verified and maintained in the relevant hardware, software and associated documentation throughout all project phases, by applying a programme where:
  - assurance is provided that all requirements are adequately specified;
  - design rules and methods are consistent with the project requirements;
  - each applicable requirement is verified through a verification programme which includes one or more of the following methods: analysis, inspection, test, review of design, audits;
  - design and performance requirements including the specified margin are demonstrated through a qualification process;
  - assurance is provided that the design is producible and repeatable, and that the specification of the resulting product can be verified and operated within the required operating limits;
  - adequate controls are established for the procurement of components, materials, software and hardware items, services;
  - fabrication, integration, test and maintenance are conducted in a controlled manner such that the end item conforms to the applicable baseline;
  - a nonconformity control system is established and maintained in order to track nonconformities systematically and to prevent reoccurrence;
  - records are maintained and analysed to report and detect trends in due time for preventive/corrective actions;
  - inspection, measuring and test equipment and tools in use on the contract are controlled to be accurate for their application;
  - procedures and instructions are established which provide for the identification, segregation, handling, packaging, preservation, storage and transportation of all items;

- assurance that the operations including post-flight and disposal are carried out in a controlled way and in accordance with the relevant requirements.

Requirements in this document are defined in terms of what shall be accomplished, rather than in terms of how to organize and perform the necessary work. This allows existing organizational structures and methods to be applied, where they are effective, and for the structures and methods to evolve as necessary.

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# Space systems — Programme management — Product ~~Quality~~ assurance requirements

## 1 Scope

This document defines the quality assurance (QA) requirements for the establishment and implementation of product QA programmes for projects covering mission definition, design, development, production and operations of space systems, including disposal.

It is applicable to the customer-supplier relationship for space products to the extent agreed by both parties.

## 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*

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

ISO 14300-1, *Space systems — Programme management — Part 1: Structuring a project*

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

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

ISO 14621-1:2019, *Space systems — Electrical, electronic and electromechanical (EEE) parts — Part 1: Parts management*

~~ISO 14621-1:2019~~, *Space systems — Electrical, electronic and electromechanical (EEE) parts — Part 1: Parts management*

ISO 21886, *Space systems — Configuration management*

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

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

## 3 Terms, definitions and abbreviated terms

### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9000, ISO 10795 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/>

**ISO/FDIS 27025:2023(E)**

**3.1.1**

**business agreement**

legally binding agreement, for the supply of goods or services, between two or more actors in the customer-supplier chain

Note 1 to entry: Business agreements are recorded in a variety of forms, such as:

- ~~contracts;~~
- ~~memoranda of understanding;~~
- ~~inter-governmental agreements;~~
- ~~inter-agency agreements;~~
- ~~partnerships;~~
- ~~bartering agreements;~~
- ~~purchase orders.~~

**3.2 Abbreviated terms**

AIV	assembly, integration, verification
BB	breadboard
CI	configuration item
DRB	delivery review board
DRD	document requirements definition
DWI	deviation work item
EEE	electrical, electronic, electromechanical
EGSE	electrical ground support equipment
EIDP	end item data package
FGSE	fluidic ground support equipment
FM	flight model
FGSE	fluidic ground support equipment
FM	flight model
GSE	ground support equipment
KIP	key inspection point
ICD	interface control document

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MGSE	mechanical ground support equipment
MIP	mandatory inspection point
NRB	nonconformity review board
OGSE	optical ground support equipment
QA	quality assurance
PA	product assurance
PM	project manager
PTR	post test review
PVS	procedure variation sheet
QM	qualification model
RFD	request for deviation
RFW	request for waiver
SOW	statement of work
TRB	test review board
TRR	test readiness review
WI	work item

## 4 QA programme management

### 4.1 QA programme

The supplier shall implement a QA programme for products whereby assurance is given that:

- a) ~~a)~~ all requirements are specified through definition and implementation of adequate methods and procedures;
- b) ~~b)~~ a set of design rules and methods has been set up and is consistent with the project techniques and technologies;
- c) ~~c)~~ methods, procedures and tools have been defined and are implemented in order to prove that each applicable requirement is verified through one or more of the following methods: analysis, inspection, test, review of design, audits;
- d) ~~d)~~ for each configuration item there is a defined and implemented qualification approach that makes it possible to demonstrate that the item is so designed that it performs satisfactorily in the intended environment;
- e) ~~e)~~ the approach adopted guarantees that the design is producible and repeatable and that the resulting product can be verified and operated within the required operating limits;
- f) ~~f)~~ adequate controls are established for the procurement of components, materials, software and hardware items, services;
- g) ~~g)~~ fabrication, integration, test and maintenance are conducted in a controlled manner so that the end item conforms to the applicable baseline;
- h) ~~h)~~ a nonconformity control system is established and maintained in order to systematically track and prevent recurrence;

## **ISO/FDIS 27025:2023(E)**

- i) ~~it~~—records are maintained and analysed so that trends can be detected and reported in time to enable preventive or corrective actions to be taken;
- j) ~~it~~—equipment and tools used for inspecting, measuring and testing project items are regularly calibrated to ensure their accuracy;
- k) ~~it~~—procedures and instructions are established which provide for the identification, segregation, handling, packaging, preservation, storage and transportation of all items;
- l) ~~it~~—assurance is provided that the operations including post-flight and disposal are carried out in a controlled way and in accordance with the relevant requirements.

The specific requirements for ground support equipment (GSE) are defined in Annex A.

### **4.2 Organization**

~~General requirements for organization~~Organization and responsibilities ~~are defined~~ in the frame of space programmes ~~as shall be in accordance with the general requirements~~ defined in ISO 14300-1 and ISO 14300-2.

The supplier shall identify the personnel responsible for implementing and performing QA functions.

### **4.3 QA programme plan**

The supplier shall prepare, maintain and implement a plan of the QA activities, in accordance with the general requirements in ISO 14300-2.

The plan may be part of the overall project product assurance plan.

### **4.4 QA status reporting**

The supplier shall periodically prepare and submit to the customer reports on the status and progress of the QA programme, as part of the overall PA reporting.

### **4.5 Personnel training and certification**

**4.5.1** The supplier shall establish a documented training programme for QA personnel and all other personnel whose performance determines or affects product quality.

**4.5.2** Operators performing critical processes shall be trained and certified by internal or external training programmes, or can demonstrate a regular and satisfactory use of the related skills.

**4.5.3** Those inspecting or controlling critical processes, or performing non-destructive testing and evaluation, shall be trained and certified according to national or international training programmes and standards, or can demonstrate a regular and satisfactory use of the related skills.

### **4.6 QA programme audits**

**4.6.1** The supplier shall perform systematic audits on its own performance to verify the implementation and effectiveness of the provisions defined in the QA programme plan.