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# Space systems — Launch pad and integration site operational documents

*Systèmes spatiaux — Documents opérationnels pour aire de lancement et site d'intégration*



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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*.



This second edition cancels and replaces the first edition (ISO 26870:2009), which has been technically revised.

The main changes are as follows:

— “Terms and definitions” section was updated;

— information, provided in Table 1, Bibliography, was specified;

— Term 3.15 “preventive maintenance” was removed,

— new 5.2 was added.

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.

# Introduction

This document establishes a list of documents that personnel are intended to use during operation of the launch pad and the integration site, when multiple nations cooperate and participate in the development or operation of these sites. This document also establishes requirements for the structure and contents of operational documents and rules for their preparation. The purposes of this document are:

— to provide personnel with standardized documents containing the information and procedures necessary for effective and safe operation of the launch pad and integration site;

— to provide a procedure for applying these documents;

— to provide organizations and corporations that develop the operational documents with the common rules of their development.

# Space systems — Launch pad and integration site operational documents

## 1 Scope

This document establishes requirements for the nomenclature, structure and contents of operational documents used at a launch pad or integration site.

When there is international participation, partnership or cooperation in the design, development, installation, test, activation or operation of a launch pad or integration site, this document applies to the development of the operational documents required for the following circumstances:

— installation, testing, activation or operation within the territory of one country of a launch pad or integration site manufactured in another country;

— joint installation, testing, activation or operation when the equipment designed and manufactured in one country is part of the launch pad or integration site designed by another country;

— training of the launch pad or integration site personnel of one country by the experts from another country.



The development and use of the operational documents described in this document are applicable to the following international launch pad or integration site operations:

a) preparation of integration site equipment to receive space vehicles and spacecraft;

b) preparation of launch pad equipment and the space complex for the launch of space vehicles;

c) space vehicle launch;



d) post-launch maintenance of the integration site and launch pad;

e) periodic maintenance of the integration site and launch pad.

## 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 23041, *Space systems — Unmanned spacecraft operational procedures — Documentation*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions 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**
**assembly, repair and regulation manual**
**AM**
document containing detailed descriptions of the *complex* (3.2), system operations or tests required for assembly, repair and regulation

**3.2**
**complex**
*launch pad* (3.7) or *integration site* (3.6)

**3.3**
**customer**
person or organization that could or does receive a product or a service that is intended for or required by this person or organization

[SOURCE: ISO 10795:2019, 3.78, modified — EXAMPLE and note 1 to entry have been removed.]

**3.4**
**data log book**
**DLB**
collection of documents that define the initial and current technical condition of a facility, system or item of equipment

**3.5**
**hazard analysis**
**HA**
determination of potential sources of danger, causes, effects, hazard level, and recommended resolution for those conditions found in either the hardware/software system, the person-machine relationship, or both, that can cause loss of personnel capability, loss of system, or loss of life/injury to the public

[SOURCE: ISO 10795:2019, 3.121, modified — The abbrevaited term "HA" has been added.]



**3.6**
**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* (3.7)

[SOURCE: ISO/TR 17400:2021, 3.1]

**3.7**
**launch pad**
equipment and facility designed to provide for the pre-launch and launch operations of spacecraft

[SOURCE: ISO/TR 17400:2021, 3.3]

**3.8**
**main system**
constituent part of *launch pad* (3.7) or constituent part of *integration site* (3.6) primarily responsible for providing preparation and launch of a launch vehicle or spacecraft

[SOURCE: ISO/TR 17400:2021, 3.6]

**3.9**
**main system field testing**
*launch pad* (3.7) or *integration site* (3.6) development phase including the testing of an assembled, fully equipped, and checked out (or factory tested) *main system* (3.8), which is conducted at the operational launch pad or integration site to determine the system readiness for further testing or operation

[SOURCE: ISO/TR 17400:2021, 3.8]

**3.10**
**maintenance manual**
**MM**
document containing detailed descriptions of the maintenance procedures that are required for a *complex* (3.2) or *main system* (3.8)

**3.11**
**operation and maintenance manual**
**O&M manual**
collection of documents that provide the information necessary to familiarize the personnel with the operation and maintenance of a facility, system or item of equipment

**3.12**
**operational manual**
**OM**
document containing detailed descriptions of the *complex* (3.2), system operations or tests required for space vehicle launch preparation and launch

**3.13**
**original operational document**
operational document containing the necessary original signatures, or electronic version containing personal codes of the officials signing the document and protected from unauthorized changes

Note 1 to entry: Copies are supplied to users.



**3.14**
**post-launch maintenance**
activities required to repair damage to the *launch pad* (3.7) caused by launch of a space vehicle

**3.15**
**spare part**
item, part, device, tool or material required to repair and maintain a facility, system or item of equipment



**3.16**
**spare-parts list**
**SPL**
document that identifies all *spare parts* (3.16)

**3.17**
**spare-part use manual**
**SPUI**
document containing detailed descriptions of the operations or tests required to use *spare parts* (3.16)

**3.18**
**system documentation list**
**SDL**
list of all operational documents necessary for a given facility, system or item of equipment

**3.19**
**test, assembly and inspection record file**
**TAIR file**
collection of test operations, maintenance, modification, problem report or inspection documentation of a facility, system or item of equipment

Note 1 to entry: Two or more TAIR files located in the same place can be referred to as a “TAIR station”.

# 4 General requirements

## 4.1 Operational-document applicability

The operational documents in this document are required for the following activities:

a) personnel training;

b) launch pad and integration site operation;

c) recording the results of launch pad and integration site operation;

d) launch pad and integration site maintenance;

e) logistics.

Operational documents that are generally developed are included in Table 1, along with their applications.

**Table 1 — Types of operational documents**

| Code | Name | Application | |
|---|---|---|---|
| | | complex | main system |
| SDL | System documentation list | a | a |
| O&M | Operation and maintenance manual | a | a |
| OM | Operational manual | a | a |
| MM | Maintenance manual | b | a |
| AM | Assembly, repair and regulation manual | b | b |
| DLB | Data log book | a | a |
| TAIR | Test, assembly and inspection record file | a | a |
| HA | Hazard analysis | b | b |
| SPL | Spare-parts list | c | a |
| SPUI | Spare-part use manual | b | b |
| DWG | Drawing[d] | a | a |

[a] The document is mandatory.

[b] The document is optional and is developed, when required, by the customer.

[c] The document is not required.

[d] Drawings can be included in O&M, OI, MI or AI.

Depending on the type of facility, system or item of equipment, the amount of information, operational conditions or national practice, the operational documents and applications listed in Table 1 may be changed as follows:

— to add other operational documents;

— to waive operational documents deemed unnecessary;

— to combine several operational documents into one document (e.g. OM, AM and MM may be combined as a single type of manual);

— to divide an operational document into several separate documents;

NOTE The titles of the resulting separate documents can reflect their contents.

— to waive individual sections from an operational document;

— to add indispensable sections.

The SDL and the contents of operational documents for al complexes and main systems shall be determined by the corresponding developers.

## 4.2 Overall content requirements

Operational documents shall include the exact parameters, characteristics and other properties included in the corresponding design documents. Parameters, characteristics or properties missing from design documents shall not be included in corresponding operational documents. Operational documents shall be clear and comprehensive, with no dependence on other documents, except as noted in 4.7.

The words “ATTENTION” or “FORBIDDEN” shall precede the description of security measures.

Spelling and appearance in operational documents shall conform with ISO 23041, except in relation to illustrations.

The operational document original shall be stored by the developer of the subject complex or main system.

Each operational document shall include a list of changes or revisions in accordance with Clause 6.

## 4.3 Publishing medium

Operational documents shall be published and distributed either on paper or electronically, depending on the intended use of the documents, their means of control, the skill of the personnel involved and the requirements of the customer.



The paper on which operational documents are published shall not exceed (210 × 297) mm, except as noted in 4.5.

The paper and stitching chosen shall have a long term of service. The customer shall determine the means of electronic publishing and distribution.



## 4.4 Approval and delivery

Operational documents shall be approved in accordance with national practice and shall be delivered to the operational site before main system field testing has begun. If the subject operational document contains references to other operational documents (see 4.7), those referenced operational documents shall also be delivered to the operational site.

## 4.5 Illustrations

Operational documents shall include illustrations of all components mentioned in the technical description. Each component shall be identified by a number and called out in a legend in the illustration. The illustrations may be placed in the text of a document or in attachments.

A sheet dimension of (297 × 210) mm, of (297 × 420) mm or of (297 × 630) mm shall be used. On sheets of width 420 mm or 630 mm, illustrations shall be placed toward the outside margin.

## 4.6 Attachments

Information required for launch or launch preparations shall be included in the main text of the operational document, not in an attachment. Supplemental or minor information may be included in attachments and may be bound together with or separately from the main text of the printed operational document. Attachments may be included in the electronic files of operational documents or may comprise separate files.

EXAMPLE Suitable material for attachments include illustrations, information security requirements, requirements for spare parts and instructions for specialists.