
**Space systems — Safety
requirements —**

**Part 2:
Launch site operations**

Systèmes spatiaux — Exigences de sécurité —

Partie 2: Opérations sur le site de lancement

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

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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 third edition cancels and replaces the second edition (ISO 14620-2:2011), which has been technically revised.

The main changes compared to the previous edition are related to terms and definitions which have been aligned with ISO 10795.

A list of all parts in the ISO 14620 series can be found on the ISO website.

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

Space activities, carried out within the framework of outer space treaties adopted by the United Nations, may cause harm to people and create damage to public and private property and the environment. The variety of professional disciplines linked to space activities and the legal liabilities incumbent on countries require international regulations to protect Earth populations against the consequences of a possible mishap caused by these activities. The international treaties listed in [Annex A](#) define the liabilities for damage related to space activities.

This document pertains to exposed people (including populations and personnel), launch systems, manned or unmanned space vehicles, operations carried out on or from a launch site and associated procedures, natural environment, etc., during prelaunch (integration, test, checking, preparation, etc.) and launch activities.

This document is intended to be applied by any country, by any international organization, whether governmental or non-governmental, and by any operator undertaking space activities within the framework of outer space treaties adopted by the United Nations.

This document is intended to be applied by agencies, enterprises, manufacturers, customers, designers, operators, facility authorities, launch service providers, etc., participating in the activities carried out on or from a launch site, unless more restrictive requirements are imposed by the national regulations in effect on the launch site.

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Space systems — Safety requirements —

Part 2: Launch site operations

1 Scope

This document specifies requirements for the safety liabilities of countries undertaking space activities or allowing operators to perform space activities on or from their territory under outer-space treaties adopted by the United Nations. It defines the safety responsibilities for the operators involved in commercial or non-commercial space launch activities. This document establishes the overall safety requirements to be observed on a launch site for prelaunch (integration, test, checking, preparation, etc.) and launch operations of a space object. It provides the basic principles to enable any operator to implement its own safety methods, tools and procedures to ensure the safety of people and personnel, public and private property, and the environment, in a consistent and uniform manner.

The safety requirements for system safety are defined in ISO 14620-1, and the requirements for the flight safety systems in ISO 14620-3.

2 Normative reference

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*

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

ISO 14620-3, *Space systems — Safety requirements — Part 3: Flight safety systems*

3 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/>

3.1

authorization

permission granted to an *operator* (3.15) by a *responsible authority* (3.17) to perform specified space activities

Note 1 to entry: Space activities include conducting space operations, conducting *launch* (3.8) operations, operating one or more sites, and operating one or more space vehicles on or from one or more *launch sites* (3.11).

3.2

damage

loss of human life, personal injury or other health impairments, occupational illness, total or partial loss of public or private property, or degradations caused to the aforesaid property or to the environment

**3.3
dangerous area**

area associated with a mishap or a potential mishap, inside which the consequences are catastrophic or critical

**3.4
flight plan**

plan related to the in-flight *launch* (3.8) vehicle, including data directly or indirectly related to *launch site* (3.11) safety

**3.5
flight safety**

arrangements intended to control *safety risks* (3.19) from *launch* (3.8) through the flight of a *space object* (3.20), and to protect people, public and private property, and the environment, against any *damage* (3.2) that could be caused by in-flight manoeuvres of this space object

**3.6
ground safety**

arrangements intended to reduce and control *safety risks* (3.19) identified in ground prelaunch and *launch* (3.8) activities of a manned or unmanned space vehicle

Note 1 to entry: Arrangements include protecting people, public and private property, and the environment, and completing and adjusting the *national regulatory laws* (3.14) related to occupational safety and health, workers, environment, space, etc.

**3.7
inhibit**

verifiable design feature intended to prevent a hazardous situation from occurring, that provides an interruption between an energy source and a function actuator

EXAMPLE An inhibit can be a function, a product, a hardware, a software, a physical property, or a technological device.

**3.8
launch**

initial action to place, or attempt to place, a launch vehicle and payload, if any, in a suborbital trajectory, in Earth orbit in outer space, or otherwise in outer space

**3.9
launch complex**

site assigned to or owned by a *launch* (3.8) vehicle *operator* (3.15) to operate a launch vehicle

**3.10
launch phase**

period which begins when the *launch* (3.8) vehicle is no longer in physical contact with the *launch complex* (3.9) or the carrier aircraft and continues up to the end of the mission assigned to it including disposal and passivation actions

Note 1 to entry: The launch phase ends when any planned and unplanned physical contact with the ground or destruction or breakdown of the vehicle takes place.

**3.11
launch site**

site necessary for the prelaunch and *launch* (3.8) operations of a space vehicle and for the in-flight operations during the *launch phase* (3.10)

**3.12
launch site country**

country that has jurisdiction over a specified *launch site* (3.11)

3.13**launch system**

system made up of a *launch* (3.8) vehicle, the associated *launch complex* (3.9), *launch site* (3.11), payload, ground support equipment and associated airborne equipment (including software), control systems, navigation system, trajectories, procedures, necessary personnel, and any other associated items

3.14**national regulatory laws**

set of official statutes of a country

Note 1 to entry: The official statutes include constitution, law, decree, administrative order, code, regulation, etc.

3.15**operator**

governmental or non-governmental entities, international organization, or natural person carrying out a space operation independently and under its responsibility

3.16**residual safety risk**

safety risk (3.19) associated with the hazards and/or hazardous situations remaining in a space system after eliminating hazards and hazardous situations as much as practical, and reducing the unacceptable safety risks

3.17**responsible authority**

ministry, department, agency, subsection, or office of a government or international governmental organization, which is responsible for space activities including, but not limited to, *launch* (3.8) operations in a specified location or country

3.18**safe**

property of an item and its environment that limits its potential for *damage* (3.2) to an acceptable risk

3.19**safety risk**

measure of the potential consequences of a hazard considering the probability of the associated mishap, the harm caused to people and the *damage* (3.2) caused to public and private property and the environment

Note 1 to entry: The safety risk is defined to be differentiated from political, financial, industrial, project, and other risks.

Note 2 to entry: An example of a safety risk is the expected number of casualties.

3.20**space object**

space vehicle of artificial earthly origin and any of its component parts, except space debris, if any

3.21**specific authorized operator**

entity allowed or licensed to conduct a space operation in an independent way according to relevant applicable space law

4 Operator's safety responsibilities**4.1 General**

The following subclauses define the general allocation of the safety responsibilities and requirements for the prelaunch (integration, test, checking, preparation, etc.) and launch operations related to a launch system. It is understood, in this document, that each operator is either duly authorized or

entered into an appropriate contract (specific agreement, commercial contract, etc.) with a responsible authority or an authorized operator. Several operators (e.g. launch site operator, site operator, launch vehicle operator, payload operator) can operate simultaneously on the same launch site. They can be concerned either with the same launch system or with different systems.

4.2 Occupational safety and health

It is presupposed that any operator carrying out operations on a launch site respects and applies the occupational safety and health requirements of the launch site country.

4.3 Ground and environment safety

4.3.1 Ground safety operator

Ground safety responsibilities and requirements vary among operators. Generally, the different operators should determine themselves how safety concerns should be met. However, on the same launch site, the following conditions or criteria may exist:

- a) several operators can carry out hazardous operations simultaneously;
- b) hazardous operations can cause harm to personnel or damage to private or public property (external to the launch site facilities) or the environment;
- c) hazardous operations carried out by one operator can cause harm to personnel or property damage to another operator;
- d) some hazardous operations are performed by several operators.

Therefore, ground safety responsibilities and requirements shall be allocated between a specific operator selected from all the authorized operators, the ground safety operator in this document, and other operators carrying out prelaunch (integration, test, checking, preparation, etc.) or launch operations on the launch site.

4.3.2 Ground safety operator responsibilities

Some ground safety responsibilities are general enough to be specified in this document.

The ground safety operator shall be approved by the national responsible authority of the launch site country to perform the activities related to its ground safety responsibilities.

The ground safety operator shall be responsible for:

- a) identifying, supervising and coordinating the allocation of ground safety responsibilities and requirements among the operators;
- b) specifying ground safety rules to be applied by the operators meeting one or more of the previous criteria (as described in [4.3.1](#)) associated with the hazardous operations;
- c) verifying the application of the specified rules;
- e) reviewing and approving the procedures of hazardous operations meeting one or more of the previous criteria b), c) and d) and as described in [4.3.1](#);
- f) supervising and coordinating hazardous operations meeting one or more of the previous criteria (as described in [4.3.1](#));
- g) verifying that the emergency plans of the operators performing hazardous operations meeting one or more of the previous criteria (as described in [4.3.1](#)) are consistent and in accordance with the approved emergency procedures;
- h) defining the general safety training (as required in [6.6.2](#));