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Space systems — Safety requirements —

Part 3: Flight safety systems

Systèmes spatiaux — Exigences de sécurité —

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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).

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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.

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 14620-3:2005), which has been technically revised. The main changes compared with the previous edition are as follows:

— the text has been updated to be consistent with ISO 14620-1 and ISO 14620-2.

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.

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Introduction

Space launch activities can present hazards to people and damage to property and the environment. International space treaties adopted by the United Nations impose legal liabilities on countries involved in launching space vehicles to provide compensation for certain injuries and damages incurred as the result of such launches.

This document affects the safety of exposed people, property and environment, as well as countries and organizations conducting commercial or civil launch activities.

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Space systems — Safety requirements —

Part 3:
Flight safety systems

1 Scope

This document sets out the minimum requirements for flight safety systems (FSSs), including flight termination systems (FTSs, externally controlled systems or on-board automatic systems), tracking systems, and telemetry data transmitting systems (TDTSs) for commercial or non-commercial launch activities of orbital or suborbital, unmanned space vehicles. The intent is to minimize the risk of injury or damage to persons, property or the environment resulting from the launching of space vehicles.

This document can be applied by any country, by any international organization, whether intergovernmental or not, and by any agency or operator undertaking the launching of space vehicles.

This document is intended to be applied by any person, organization, entity, operator or launch authority participating in commercial or non-commercial launch activities of orbital, or suborbital, unmanned space vehicles unless more restrictive requirements are imposed by the launch site country.

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

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

ISO 14620-2, *Space systems — Safety requirements — Part 2: Launch site operations*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10795, ISO 14620-2 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
flight safety system
combination of flight-, ground- or space-based hardware and software designed, installed and/or operated specifically for providing flight safety

Note 1 to entry: This combination of equipment, facilities, procedures and personnel required to monitor operations provides protection to personnel and property both foreign and domestic from any damage that can be caused by a non-nominal flight.

Note 2 to entry: The flight safety system may include *flight termination systems* (3.2), *telemetry data transmitting systems* (3.6) and *range tracking systems* (3.4).

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3.2
flight termination system
explosive or other disabling or thrust-terminating equipment installed in a launch vehicle, plus any associated ground equipment, for terminating the flight of a malfunctioning vehicle or stage

3.3
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

3.4
range tracking system
combination of flight-, ground- or space-based hardware and software designed, installed and/or operated specifically for tracking a launch vehicle

3.5
safety envelope
area designated for *launch* (3.3) and preorbital flight that is cleared of uninvolved persons or where the risk of injury, fatality or property damage to the public is below a designated *threshold probability* (3.7)

3.6
telemetry data transmitting system
combination of flight- or space-based hardware and software, designed, installed or operated for down-linking vehicle and flight system performance and health data to flight safety operators

3.7
threshold probability
probability that loss or damage will exceed a specified level

Note 1 to entry: Threshold probability is a quantitative measure that represents the probability of occurrence associated with unplanned events or levels of damage caused by launch-related activities.

4 Abbreviated terms

FSS	flight safety system
FTS	flight termination system
GNSS	global navigation satellite system
GSE	ground support equipment
RTS	range tracking system
S&A	safe and arm
SFP	single failure point
TDTS	telemetry data transmitting system

5 General requirements

5.1 All launch vehicles shall incorporate tracking devices or establish means of tracking that enable real-time monitoring of vehicle position and velocity, and prediction of instantaneous impact points throughout the launch phase where it is necessary to satisfy the safety envelope requirement.

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