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BSI Standards Publication

Space systems — Re-entry risk management for unmanned spacecraft and launch vehicle orbital stages

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National foreword

This British Standard is the UK implementation of ISO 27875:2019+A1:2020. It supersedes BS ISO 27875:2019, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to ISO text carry the number of the ISO amendment. For example, text altered by ISO amendment 1 is indicated by **A1** **A1**.

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A list of organizations represented on this committee can be obtained on request to its committee manager.

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Space systems — Re-entry risk management for unmanned spacecraft and launch vehicle orbital stages

*Systèmes spatiaux — Gestion du risque de la rentrée pour les étapes
orbitales des véhicules spatiaux non habités et des lanceurs 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).

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 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.

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 27875:2010) which has been technically revised. It also incorporates the Amendment ISO 27875/Amd1:2016. The main changes compared to the previous edition are as follows:

- revised [6.2](#);
- a Note 1 to entry was added to the definition of Ec;
- long sentences were divided into multiple sub-clauses with each sub-clause containing just one requirement.

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

According to international treaties, the “launching state” is liable for damage or injuries caused by unmanned spacecraft and launch vehicle orbital stages that re-enter the Earth's atmosphere. In addition, commercial operators are subject to the national safety regulations or laws of the launching country that relate to the re-entry of spacecraft and launch vehicle orbital stages. To minimise damage and injuries from re-entering spacecraft and launch vehicle orbital stages, all parties (i.e., developers, manufacturers, space service providers, satellite operators, and launch service providers) should take preventive measures during design and operations.

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Space systems — Re-entry risk management for unmanned spacecraft and launch vehicle orbital stages

1 Scope

This document provides a framework with which to assess, reduce, and control the potential risks that spacecraft and launch vehicle orbital stages (referred to hereinafter as “space vehicles”) pose to people and the environment when those space vehicles re-enter the Earth's atmosphere and impact the Earth's surface. It is intended to be applied to the planning, design, and review of space vehicle missions for which controlled or uncontrolled re-entry is inevitable.

This document is applicable to following objects in assessing their risk to the ground:

- a) objects re-entering from orbit in conformance with ISO 24113;
- b) launch vehicles (including payloads, other objects separated during the ascent phase, etc.) that are mentioned in flight safety activities under ISO 14620-2^[1]; and
- c) interplanetary spacecraft returning to Earth.

This document complements ISO 14620-1 and ISO 17666.

This document is not applicable to spacecraft containing nuclear power sources^[2].

NOTE 1 This document does not apply to Space Transportation Systems with wings and control functions intended for targeted landing.

NOTE 2 Useful background information for this document is available in ISO 24113.

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

ISO 17666, *Space systems — Risk management*

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

ISO 24113, *Space systems — Space Systems Space debris mitigation requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10795, ISO 24113 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>