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Space systems — Launch-vehicle-to-spacecraft interfaces

Systèmes spatiaux — Interfaces entre le lanceur spatial et le véhicule spatial

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Foreword

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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 14303:2002), which has been technically revised.

The main changes are as follows:

— revision of terms and abbreviated terms (Clauses 3 and 4);

— revision of usable volume definition in Clause 5;

— revision of mission performances in Clause 8;

— revision of Figures A2, B1, B2, C5, C6, D1, D3, D6, and D7.

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

This document, ISO 15863 and ISO 17401 form a set of International Standards that fully describe the process for communicating information about launch vehicle (LV) to spacecraft (SC) interfaces.

Clauses 4 to 7 identify the parameters of an LV–SC interface, Clause 8 is related to mission performances, while Clauses 9 to 11 define the methodology for verification of the interface by analyses, testing or both. Clause 12 defines the operations performed on the SC to prepare it for launch and the joint operations performed until it is installed on the LV.

Annexes A to E give examples of the typical presentation format of the various interface parameters, as appropriate.

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Space systems — Launch-vehicle-to-spacecraft interfaces

1 Scope

This document specifies the interfaces between a launch vehicle (LV) and the spacecraft (SC) being launched, to provide LV and SC organizations with the necessary format for presenting the required technical data on existing and future interfaces.

Its intended purpose is to minimize costs and reduce the risks from errors resulting from miscommunication. It does not limit the ability of LV or SC organizations to specify unique requirements.

2 Normative references

There are no normative references in this document.

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
SC system
spacecraft system
spacecraft bus, payload and all items supplied by the SC contractor in support of the launch effort

3.2
LV system
launch vehicle system
launch vehicle and associated launch services supplied by the launch services contractor or subcontractors, or both

3.3
separation plane
plane where launch vehicle and spacecraft separation occurs

3.4
mating plane
interface between the spacecraft, or the spacecraft-provided *payload adapter* (3.5), and the launch vehicle

3.5
payload adapter
PLA
structure that mates the spacecraft to the launch vehicle, including the SC–LV separation system

Note 1 to entry: The PLA can be part of the LV and, when the spacecraft and the launch vehicle are separated, stays with the launch vehicle.

Note 2 to entry: Some PLA are such that they are bolted to the spacecraft and that the separation plane is inside the PLA. In that case, after separation the upper part of the PLA stays onto the spacecraft, the lower part of the PLA stays with the launch vehicle.

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3.6
usable volume
volume available to the payload within the LV fairing or carrying structure that the static envelope of the SC cannot exceed in order to ensure that there is no physical contact between the SC and the LV in a dynamic environment

Note 1 to entry: See Figures A.1 to A.4.

4 Abbreviated terms

ACS	attitude control system
CG	centre of gravity
EMC	electromagnetic compatibility
GSE	ground support equipment
GTO	geosynchronous transfer orbit
ICD	interface control document
IRD	interface requirements document
LEO	low Earth orbit
LV	launch vehicle
PLA	payload adapter
PLF	payload fairing
RF	radio frequency
SC	spacecraft
SPF	spacecraft processing facility
SPM	solid propellant motor
SSO	sun synchronous orbit
TM	telecommand

5 Mechanical interfaces

5.1 General

This clause identifies the mechanical interfaces between the SC and the LV. The methodology for verifying these interfaces is discussed in Clauses 9 to 11.

5.2 Mechanical configurations

The SC shall be mated to the LV by a PLA. If the LV provides the PLA, it may include a pyrotechnically activated or other adequate separation system. If the SC provides its own separation system, then a static bolted interface to the LV in accordance with 5.4 shall be used. During final launch processing and launch ascent, the SC shall be contained in a structure provided by the LV contractor.

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