
**Space systems — Requirements
of launch vehicle (LV) to electrical
ground support equipment (EGSE)
interfaces**

*Systèmes spatiaux - Exigences d'interface entre le lanceur et les
équipements électrique de support au sol*

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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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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*.

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 provides design requirements of electrical interfaces between launch vehicles (LV) and electrical ground support equipment (EGSE) for launch system or interface designers. The defined interface type and requirements constitute the LV to EGSE interface control document (ICD).

The purpose of this document is to specify standardized requirements and help the designer specify the LV to EGSE ICD and subsequently help users to clearly understand the designer's intentions, and hence minimize costs and reduce risk from errors resulting from miscommunication. This document does not consider interface design details and does not limit LV or EGSE organizational requirements to specify a unique interface.

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Space systems — Requirements of launch vehicle (LV) to electrical ground support equipment (EGSE) interfaces

1 Scope

This document provides requirements for launch system designers or interface designers regarding interfaces between LV and EGSE, which is used to support on-line processing. It defines electrical interface types, design requirements, environment requirements, verification methods (analyses and tests), and interface check operation requirements.

This document is intended to minimize design costs and reduce risks from errors resulting from miscommunication. It does not limit LV or EGSE organizational requirements to specify a unique interface.

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 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 electrical ground support equipment

EGSE

non-flight electrical equipment or system used to support on-line processing and associated launching services

3.2 interface control document

ICD

formal means of describing the inputs and outputs of a system, the interfaces among systems, or the protocols among physical or electronic elements of an entity

[SOURCE: ISO/TR 16158:2013, 3.6]

4 Abbreviated terms

The following abbreviations are used in this document.

LV	Launch vehicle
EMC	Electromagnetic compatibility
IRD	Interface requirements document
I/O	Input/Output

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AC	Alternating current
DC	Direct current
RF	Radio frequency
CAN	Controller area network
FC	Fibre channel
TM	Telemetry
TC	Telecontrol

5 Interface design principles

5.1 General

The LV to EGSE interface requirements presented in this standard may be tailored depending on negotiations between LV contractor and EGSE contractor.

In general, the LV to EGSE interface design shall include the following requirements:

- a) control requirements for the LV electrical system;
- b) test requirements for the LV electrical system;
- c) power supply requirements for the LV electrical system.

5.2 Design process

The design shall be based on an LV to EGSE interface requirement analysis. The design process shall follow the general workflow shown in [Figure 1](#).

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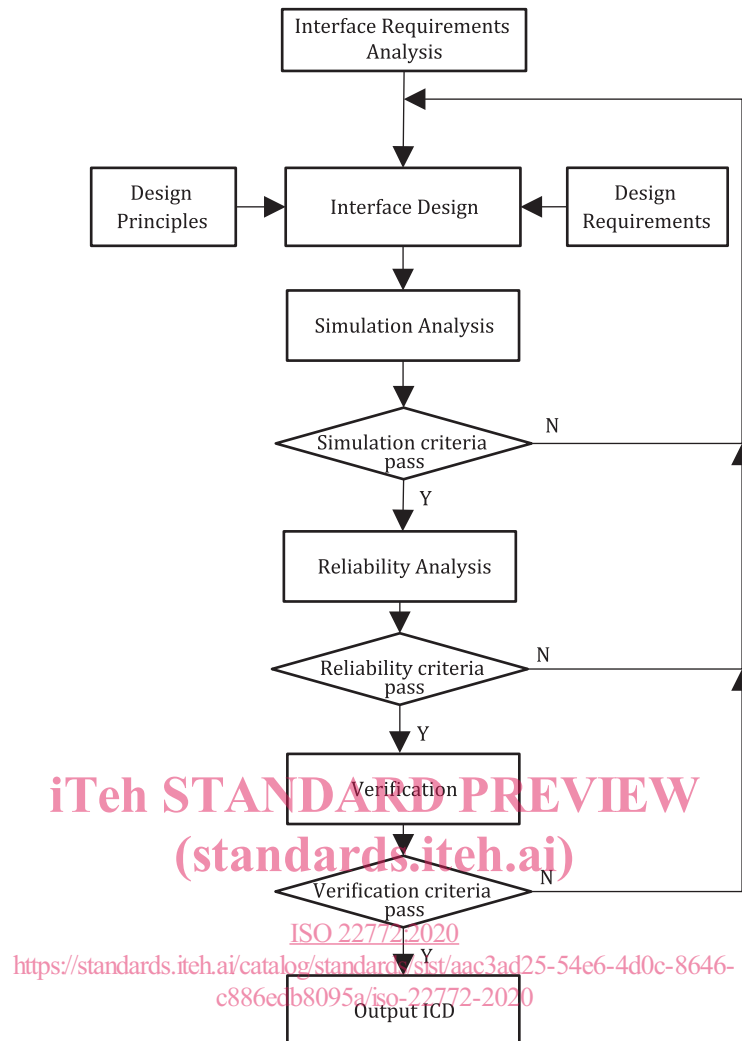


Figure 1 — Launch vehicle to electrical ground support equipment interface design process

5.3 Design principles

The design principles are as follows.

- a) The interface signal definition shall be clear and unambiguous.
- b) A ready-made standard interface must be adopted to decrease the number of interface types.
- c) The necessary provisions should be put in place for development and implementations of measures aimed at preventing mixes in connection between equipment communications and the same type component items.
- d) Electrical performance shall be matched between sources and loads.
- e) Isolation measures shall be taken to prevent mutual influences among the equipment or systems under a failure state.
- f) Electromagnetic compatibility shall be considered, including but not limited to, filtering, shielding, and grounding.
- g) Redundancy design shall be considered.