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Space systems — Human-life activity support systems and equipment integration in space flight — Techno-medical requirements for space vehicle human habitation environments

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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.

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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 operation*.

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Introduction

This document is intended for developing life support, thermal control by systems of space vehicles and creating in those vehicles an environment needed to support crew life during a mission to space.

This document, which is a 2nd level standard with respect to ISO 17763 *Space systems — Human-life activity support systems and equipment integration in space flight* establishes the area for "Human Habitable Environment in Space Flight". The list of 3rd level standards specifies requirements for the habitable environment, which are supported by a suite of life support technical systems.

The objectives of this document are:

— to establish for the developers of life support systems a set of common technical and medical requirements for crew life support;

— to create a habitation environment for a crew that supports their life activities; and

— to establish common habitable environment standards for supporting crew life activities for the medical personnel.

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Space systems — Human-life activity support systems and equipment integration in space flight — Techno-medical requirements for space vehicle human habitation environments

1 Scope

This document is a second level standard is one of the several others regarding human-life activity support systems and equipment integration in space flight.

This document, along with first and third level standards, form a complex three-level international standard entitled "Space systems — Human-life activity support systems and equipment integration in space flight".

It is applicable to human space flight programs in all manned space objects, including spacecraft, space stations, lunar and planetary bases, as well as extravehicular activity. It covers all phases for developing a manned space object, such as design, production, tests, operation, and maintenance.

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 17763, *Space systems — Human-life activity support systems and equipment integration in space flight*[1)]

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:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
human habitation environment in spacecraft
complex issue that involves material, energy and information flows, as well as elements formed in SC habitable compartments

Note 1 to entry: Such elements are derived from life activity processes, human social-labour processes, space factors, space mobility, and hardware functioning processes, including the ones designed to arrange humans' interaction with the habitation environment in order to provide specified conditions for human life activity in space flights.

[SOURCE: ISO 17763, 3.1]

1) Under preparation. Stage at time of publication: ISO/FDIS 17763:2018.

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3.2
human living conditions in spacecraft
complex of human habitation environment parameters in SC, providing health maintenance, human safety and keeping of human's ability to work at a level needed to execute the planned work program

[SOURCE: ISO 17763, 3.2]

3.3
techno-medical requirements for human habitation environments
complex of biomedical, hygiene/sanitary, ergonomic and design requirements

Note 1 to entry: Those requirements take into account physiological and social-psychological human needs in the process of hardware development and operation in order to guarantee specified living conditions aboard space systems.

[SOURCE: ISO 17763, 3.3]

3.4
manned (habitable) spacecraft
MSC
spacecraft, spaceship, space station, Lunar or planetary base with pressurized components inside which human habitation environment is maintained

3.5
life support systems
LSS
systems supporting mass and energy exchange between space traveller's body and habitable environment inside MSC

3.6
Extravehicular Activity
EVA
spacesuited activities outside MSC

4 Symbols (and abbreviated terms)

SS space systems

SC spacecraft

5 Application of this document in space programs

5.1 Standard applicability

Implementing of space programs, integration with human life activity shall be considered at all levels — from individual components to full integration.

All requirements stated in this document, unless otherwise specified, shall be applicable to all phases of the flight program.

5.2 Specific program requirements

Each human space flight program shall establish its specific requirements for development of this document. These requirements shall be verifiable.

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