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Space systems — Human-life activity support systems and equipment integration in space flight

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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*.

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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0 Introduction

0.1 General

This is a first level standard in a set of documents regarding human-life activity support systems and equipment integration in space flight.

This document, along with second 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"*.

The second level covers standards on separate issues and is entitled: *Techno-medical requirements for spacecraft crew habitation environment — Requirements for life activity support of a human in spacesuit and other requirements*.

The third level covers standards on separate tasks, with specific requirements included into the second level documents.

NOTE Detailed data regarding this first level standard are presented in Annex A.

0.2 Basis for standard development

The experience from RSC Energia, Russian allied organizations, and the authors themselves was summarized in order to develop this proposed document regarding the development and operation of Salyut LSS, Mir, and ISS space stations. In addition, the experience of joint operations with NASA in the Mir-Shuttle and Mir-NASA international programmes, as well as the experience of operation with international partners during the Mir and ISS space stations operation was taken into account.

Russian standards, USA standards and joint international normative documents were used to develop this first level standard, in human life activity support during space flight.

0.3 Purpose

The purpose of this document is to develop a common approach and unified requirements for habitability, environmental aspects, safety, comfort and evaluation and management of techno-medical conditions for manned space flight. Maintenance of these conditions is required for human life activity support systems and equipment in space flight. Such standards increase crew efficiency and support their health

0.4 Tasks

The tasks of a first level standard include the definition of requirements for development of ecological habitability in limited pressurized volumes and the definition of content of second and third level standards, the requirements of which will support human life activity in space vehicle conditions.

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Space systems — Human-life activity support systems and equipment integration in space flight

1 Scope

This document (first level standard) is the main document among the others regarding human-life activity support systems and equipment integration in space flight.

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

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

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:

— 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 flow, 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, human comfort and safety, and hardware functioning processes, including the ones that are designed to arrange human beings' interaction with the habitation environment in order to provide specified conditions for human life activity in space flights.

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

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

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