

Space sustainability – Overarching principles and framework – Guide

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Foreword

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Presentational conventions

The guidance in this document is presented in roman (i.e. upright) type. Any recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Additional commentary, explanation and general informative material is presented in smaller italic type.

Where words have alternative spellings, the preferred spelling of the *Shorter Oxford English Dictionary* is used (e.g. "organization" rather than "organisation").

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Introduction

This document aims to set out the high-level principles for responsible and sustainable space activities. Collectively, these constitute the Space Sustainability Principles.

The Space Sustainability Principles recognize the scientific, economic, cultural and individual value of our diverse relationship with space, the Moon and other celestial bodies. Space sustainability underpins the need to share the space environment on the basis of responsible, effective and collective management of all space objects. This includes those already present within the space environment (whether operationally active or inactive) and those yet to be launched. Such management entails consideration not only of the environmental and safety impact of space activities but also their scientific, economic and cultural impact. The Space Sustainability Principles provide a common framework for all stakeholders – at international, regional and national levels – to achieve these broad management goals.

The Space Sustainability Principles promote measures that limit further environmental impacts, including the generation of space debris, waste and pollution, together with those that seek to remedy the environmental impacts that have already occurred. This standard provides the overall framework for these activities.

A holistic approach to space sustainability is adopted, which takes into account the end-to-end context of space activities. It encompasses both upstream and downstream components, covering the entire production chain from material sourcing to the end-of-life disposal of a space object. Adherence to BS EN ISO 14040 and BS EN ISO 14044 for life cycle analysis ensures thorough evaluation of environmental impacts throughout the supply chain, meeting the sustainability criteria of the finance and insurance sectors. This commitment to responsible environmental management across all aspects of space economic activities acknowledges their potential benefits and disbenefits.

Sustainability is part of the broader topic of social and corporate responsibility, covered in BS EN ISO 26000. This standard is intended to be used as the basis of sustainability principles being adopted by organizations such as the European Space Agency (ESA). Socially responsible behaviour, in economic, corporate, industrial or other activities contributes to sustainable development.

The Space Sustainability Principles draw on the foundational 2018/19 United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) Guidelines on the long-term sustainability of outer space activities, in particular, the definition of those activities as “the ability to maintain the conduct of space activities indefinitely into the future in a manner that realizes the objectives of equitable access to the benefits of the exploration and use of outer space for peaceful purposes, in order to meet the needs of the present generations while preserving the outer space environment for future generations”.¹⁾ The Space Sustainability Principles look beyond this definition by also seeking to address concerns identified in Guidelines A.2, 2(c) and (d) of the UNCOPOUS Guidelines on the long-term sustainability of outer space activities, namely, the “impacts of human activities on Earth as well as on the outer space environment” and “risks to people, property, public health and the environment associated with the launch, in-orbit operation and re-entry of space objects”.

¹⁾ https://www.unoosa.org/res/oosadoc/data/documents/2018/aac_1052018crp/aac_1052018crp_20_0_html/AC105_2018_CRP20E.pdf

1 Scope

This BSI Flex gives guidance on promoting and facilitating national and international engagement with, and the understanding and management of, the long-term sustainability of outer space activities. It seeks to do this through the establishment of transparent space sustainability principles of responsible behaviour.

This document provides key definitions, including, but not limited to, space debris and space sustainability, and describes a framework based on these definitions that encapsulates the Space Sustainability Principles.

***NOTE** This document is a top-level, framework standard addressing space sustainability. It is the main interface for the user, bridging between the primary objectives and principles in this document and a future set of more specific space sustainability standards covering the aspects of the life cycle of space systems, Earth observation, and resource management and utilization, the first of which focusses on launch activities. The lower-level documents contain more detailed objectives and implementation measures associated with the high-level principles in this document.*

2 Normative references

There are no normative references in this document.²⁾

²⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 break-up

event that completely or partially destroys an object and generates space debris

[SOURCE: BS ISO 24113:2023, 3.2]

3.2 controlled re-entry

type of re-entry where the time of re-entry is sufficiently controlled so that the impact of any surviving debris on the surface of the Earth is confined to a designated area

NOTE The designated area is usually an uninhabited region such as an ocean.

[SOURCE: BS ISO 24113:2023, 3.3]

3.3 disposal

actions performed by a spacecraft or launch vehicle orbital stage to permanently reduce its chance of accidental break-up and to achieve its required long-term clearance of the protected regions

NOTE Actions can include removing stored energy and performing post-mission orbital manoeuvres.

[SOURCE: BS ISO 24113:2023, 3.4]

3.4 Earth orbit

bound or unbound Keplerian orbit with the Earth at a focal point, or Lagrange point orbit which includes Earth as one of the two main bodies

[SOURCE: BS ISO 24113:2023, 3.7]

3.5 environmental impact

change to an environment, whether adverse or beneficial, wholly or partially resulting from an organization's action or inaction, products or services

[SOURCE: BS EN ISO 14001:2015+A1:2024, 3.2.4, modified – “the environment” has been changed to “an environment”, and “environmental aspects” has been changed to “action or inaction, products or services”]

3.6 launch vehicle

DEPRECATED: launcher

system designed to transport one or more payloads into outer space

[SOURCE: BS ISO 24113:2023, 3.12]

3.7 launch vehicle orbital stage

complete element of a launch vehicle that is designed to deliver a defined thrust during a dedicated phase of the launch vehicle's operation and achieve orbit

NOTE Non-propulsive elements of a launch vehicle, such as jettisonable tanks, multiple payload structures or dispensers, are considered to be part of a launch vehicle orbital stage while they are attached.

[SOURCE: BS ISO 24113:2023, 3.13]