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## Space systems — Estimation of orbit lifetime

*Systèmes spatiaux — Estimation de la durée de vie en orbite*



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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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 14, *Space systems and operations*.

This second edition cancels and replaces the first edition (ISO 27852:2011), which has been technically revised.

## Introduction

This International Standard is a supporting document to ISO 24113 and the GEO and LEO disposal standards that are derived from ISO 24113. The purpose of this International Standard is to provide a common consensus approach to determining orbit lifetime, one that is sufficiently precise and easily implemented for the purpose of demonstrating compliance with ISO 24113. This project offers standardized guidance and analysis methods to estimate orbital lifetime for all LEO-crossing orbit classes.



# Space systems — Estimation of orbit lifetime

## 1 Scope

This International Standard describes a process for the estimation of orbit lifetime for spacecraft, launch vehicles, upper stages and associated debris in LEO-crossing orbits.

This International Standard also clarifies the following:

- a) modelling approaches and resources for solar and geomagnetic activity modelling;
- b) resources for atmosphere model selection;
- c) approaches for spacecraft ballistic coefficient estimation.

## 2 Normative References

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 24113, *Space systems — Space debris mitigation requirements*

## 3 Terms, definitions, symbols and abbreviated terms

### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 24113 and the following apply.

#### 3.1.1

##### **orbit lifetime**

elapsed time between the orbiting spacecraft's initial or reference position and orbit demise/reentry

Note 1 to entry: An example of the orbiting spacecraft's reference position is the post-mission orbit.

Note 2 to entry: The orbit's decay is typically represented by the reduction in perigee and apogee altitudes (or radii) as shown in [Figure 1](#).