



Space sustainability

Adoption Notice of ISO 24113: Space systems - Space debris mitigation requirements

**ECSS Secretariat
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Noordwijk, The Netherlands**

Foreword

This Adoption Notice is one document of the series of ECSS Standards intended to be applied together for the management, engineering and product assurance in space projects and applications. ECSS is a cooperative effort of the European Space Agency, national space agencies and European industry associations for the purpose of developing and maintaining common standards. Requirements in this Standard are defined in terms of what shall be accomplished, rather than in terms of how to organize and perform the necessary work. This allows existing organizational structures and methods to be applied where they are effective, and for the structures and methods to evolve as necessary without rewriting the standards.

This Adoption Notice has been prepared by the ECSS Space Debris Working Group, reviewed by the ECSS Executive Secretariat and approved by the ECSS Technical Authority.

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Change log

ECSS-U-AS-10A	Never issued
ECSS-U-AS-11-00A	Never issued
ECSS-U-AS-10C 10 February 2012	First issue Adoption Notice of ISO 24113:2011 (Second edition 2011-05)
ECSS-U-AS-10C Rev.1 3 December 2019	First issue Revision 1 Adoption Notice of ISO 24113:2019 (Third edition 2019-07)

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1 Scope

This document identifies the clauses and requirements (including notes and clarifications) modified or added with respect to the standard ISO 24113, Space systems — Space debris mitigation requirements, Third edition 2019-07 (referred to as ISO 24113:2019) for application in ECSS.

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Context information

The standard ISO 24113, Space systems – Space debris mitigation requirements has been developed by ISO TC20/SC14. The key space debris mitigation requirements have been thoroughly discussed at international level, agreed by the ISO members and published as standard ISO 24113.

Aiming at the development of world wide implementation standards dealing with space debris mitigation, ECSS has proactively contributed to the preparation of ISO 24113.

ECSS decided to adopt and apply ISO 24133 with a minimum set of modifications, identified in the present document, to account for the reference and applicable space debris mitigation documents existing in Europe and of the needs of the ECSS members.

In 2012, ECSS adopted ISO 24113:2011 with a minimum set of modifications (as per ECSS-U-AS-10C), which have been mostly incorporated in ISO 24113:2019. Moreover, ISO 24113:2019 represents a significant improvement with respect to the previous ISO 24113:2011. Therefore, ECSS decided to adopt and apply ISO 24113:2019 as it is, without any modifications of the requirements. However, in the present document a few clarifications with respect to ISO 24113:2019 and its application are provided to account for the needs of the ECSS members.

A major clarification addressed in the present document is to stress that space debris mitigation requirements apply to space objects in any bounded Earth orbit and apply also to space objects in unbounded Earth orbits in case there is a risk for interference with the LEO and GEO protected regions. Moreover, the present document provides clarifications about the evaluation of the probability of successful disposal based on reliability analyses and about verification methods to be agreed with the approving agents, accounting for existing ECSS implementation practices.

3 Application

- a. ISO 24113:2019, Space systems - Space debris mitigation requirements, [Third edition 2019-07](#) shall apply with the modifications and clarifications listed in Table 3-1.

Table 3-1: Applicability table for ISO 24113:2019

Clause or requirement number	Applicability	Applicable text (the new/added text is underlined)	Comments	Text as in the original document (deleted text with strikethrough)
3.8 - Earth orbit	Modified	Note 1 to entry: <u>The requirements in this document do not apply to</u> space objects (3.24) in an unbounded Earth orbit if, <u>for at least 100 years after the space objects enter the unbounded Earth orbit:</u> - <u>the assessed risk</u> of the space objects interference with the LEO and GEO (3.11) protected regions (3.21), <u>or</u> - <u>the assessed risk of the space objects re-entry (3.22)</u> <u>is less or equal to the corresponding threshold set by the approving agent.</u>	To clarify better the text of Note 1 to ISO 24113:2019 3.8 (definition of Earth orbit)	<i>Note 1 to entry: For the purposes of this document, it is not necessary to consider space objects (3.24) in unbounded Keplerian orbits if their probability of interference with the LEO and GEO (3.11) protected regions (3.21) is negligible.</i>
3.20 –	Added	<u>Note 5 to entry: The calculation of this</u>	To clarify and add information on	

Clause or requirement number	Applicability	Applicable text (the new/added text is underlined)	Comments	Text as in the original document (deleted text with strikethrough)
Probability of successful disposal		<u>probability can be based on reliability analyses performed according to “ECSS-Q-ST-30 - Space product assurance – Dependability”, “ECSS-O-HB-30-08 - Space product assurance - Components reliability data sources and their use”, or any other methods set by the approving agent.</u>	the methods to evaluate the probability of successful disposal	
7.2.2	Added	<u>Note 1 to entry: The listed contents include specific requirements, methods, tools and guidelines for which: - either detailed verification and validation means are not specified, or - a risk assessment is required but a threshold is not specified. These would be set by the approving agent dealing with requirements in this document</u>	To clarify the content of the SDMP with reference to the assessments of quantitative requirements.	