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Requirements for the re-flight of space payloads

空间有效载荷再飞要求

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part

1. Structure and Drafting Rules for Standardization Documents" drafting. Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents. This document was proposed by the Chinese Academy of Sciences. This document is under the jurisdiction of the National Space Science and Its Application Standardization Technical Committee (SAC/TC312). This document is drafted by: Center for Space Application Engineering and Technology, Chinese Academy of Sciences, Shanghai Institute of Technical Physics, Chinese Academy of Sciences, Chinese Academy of Sciences College Changchun Institute of Optics, Fine Mechanics and Physics, Institute of Optoelectronics Technology, Chinese Academy of Sciences, Beijing Space Vehicle Overall Design Department. The main drafters of this document. Huang Kun, Li Peng, Dang Wei, Fu Hongyong, Zhao Liping, Deng Xiaomei, Yuan Yongchun, Guo Xu, Fan Bin, Liang Xiaofeng, Zhao Zhenhao.

On-orbit reuse of space payloads can reduce project costs and shorten ground preparation time, while ensuring that functions and performance meet requirements and Under the premise of safety and reliability, carrying out on-orbit missions in the form of reflight is an important way to deal with the problems of high density of space missions and high development costs. The use of re-fly payloads has the following three characteristics.

a) Need to recover scientific experiment equipment and samples after completing the mission in orbit;

b) Space science programs have continuity and commonality, so there are cases where the functions and structures of payload equipment are similar or even the same. However, the generalized and standardized payload development method increases the possibility of re-flying missions on different spacecraft platforms. sex;

c) The quality level of components used in payload equipment has been continuously improved, ensuring that the design life of the payload far exceeds that of space science. The mission cycle, the payload can still work normally after recovery, and has the basic ability to perform re-flying missions. This document will standardize my country's space payload re-flying missions, promote the establishment of a generalized and internationalized space science platform, and facilitate the global Large-scale, long-term, and multi-type space science experiment projects within the scope of cooperation. Space Payload Refly Requirements

1 Scope

China's national requirements for re-flying space payloads. A payload that has flown and been returned - from a recoverable satellite, a space station, or a reusable vehicle - is a valuable asset and a suspect one. It has been through launch, orbit and re-entry; it has been vibrated, thermally cycled, irradiated and possibly exposed to atomic oxygen; and it may have been operated well beyond its qualification life. Whether it can fly again is not a question of appearance. The requirements have to establish what must be inspected, what must be re-tested, what has a defined life that has been consumed - batteries, propellant seals, mechanisms with a cycle count - and what evidence must exist from the first flight for the second to be authorised. As China's programme moves toward reusable vehicles and a permanently occupied station, the question shifts from exceptional to routine, which is why it now has a standard.

This document specifies the work items and content requirements for the space payload to perform the ground phase before the reflight mission. This document is applicable to the execution of payload plans on space vehicle platforms such as satellites, spaceships, space laboratories, space stations, and space probes. Ground preparation for the reflight mission.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references. For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 19017 Quality Management Technology Status Management Guidelines

GB/T 30114.1 Terminology for Space Science and Its Applications Part

3 Terms and Definitions

GB/T 19017, GB/T 30114.1, GB/T 32299 and the following terms and definitions apply to this document.

3.1 re-flight After returning to the ground after going through the orbital operation of the space, the related activities of planning the orbital operation again.

3.2 re-flight space payloads Equipment loaded on the space vehicle platform and planned to fly again, especially the instruments for performing space science, space exploration and applied research missions device, device or system.

Note. Hereinafter referred to as "re-fly load".

3.3 original status original status No design changes will be made to the re-fly payload, such as function and performance, structure, material, interface, etc., and the original technical status of the payload will be maintained.

3.4 refurbishment status refurbishment status Make changes to the re-fly load and replace the technical status of life-limited parts.

3.5 Improvement status improvement status The main functions and performances of the re-flying payload remain unchanged, and the secondary functions and performances of the payload are optimized or added or deleted. state.