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PEOPLE'S REPUBLIC OF CHINA**

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Replacing GB/T 29072-2012

**Drafting rules for the technical process of spacecraft
development**

航天器研制技术流程编写规则

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document replaces GB/T 29072-2012 "Rules for Writing Technical Flowcharts for Spacecraft Development". Compared with GB/T 29072-2012, except for... Aside from structural adjustments and editorial changes, the main technical changes are as follows:

- a) The definition of "technical process" has been changed (see 3.1, 2.1 in the 2012 version);
- b) The "Writing Principles" have been changed, the internal and external constraints to be considered and satisfied have been modified, and technical process work items have been added. Determine the methods, requirements for incorporating them into quality control points and technical safety critical control points (see Chapter 4, Chapter 3 and Chapter 4 of the 2012 edition). Chapter 6);
- c) The "Basis for Compilation" has been changed (see Chapter 5, Chapter 4 of the 2012 edition);
- d) Added provisions regarding the "timing of writing" (see Chapter 7);
- e) The "Writing Steps" have been modified to include identifying key (milestone) nodes, quality control points, and critical technical safety controls for model development. The document outlines the technical process and its written specifications (see Chapter 8, Chapter 7 of the 2012 edition).
- f) The "Writing Method" has been modified, and "General Requirements" have been added. Quality control points and technical safety aspects have been added to "Drawing Technical Flowcharts". Drawing key control points (see Chapter 9, Chapter 8 in the 2012 edition).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Aerospace Technology and Its Applications (SAC/TC425). This document was drafted by: Aerospace Dongfanghong Satellite Co., Ltd., China Academy of Space Technology, and Beijing Spacecraft Overall Design Department. Beijing Institute of Control Engineering, Shanghai Institute of Satellite Engineering, China Aerospace Standardization Institute, Xi'an Zhongke Xiguang Aerospace Technology Group Co., Ltd. The company, Beijing MicroNano Space Technology Co., Ltd., and Beijing Zhongke Aerospace Technology Co., Ltd. The main drafters of this document are. Yuan Yuan, Hao Ganggang, Wang Hongwei, Liang Jia, Tian Jingfeng, Hao Jinhua, Zou Leyang, Zhu Yingjie, Xiong Haolun, and Liu Chang. Xu Dongyan, Qin Jing, Liu Wei, Gao Enyu, Lian Jie, Yang Zhi. This document was first published in 2012, and this is its first revision. Spacecraft Development Technology Process Writing Rules

1.Scope This document establishes the principles for writing spacecraft development technology processes, and specifies the basis for writing, classification of technology processes, timing of writing, and steps involved. Steps and writing methods. This document is applicable to the writing of technical processes for spacecraft system, subsystem and equipment development projects.

2 Normative references

This document has no normative references.

4 Writing Principles

4.1 The starting point of the technical process system is generally the feasibility study, and the endpoint is the completion of the work specified by the user (e.g., the completion of communication satellites and remote sensing satellites). After entering orbit, the spacecraft will be put into use; the deep space exploration spacecraft will complete its main mission; and the recoverable satellite and the payload of the manned spacecraft will be delivered upon returning to Earth. Users, etc.

4.2 The writing process is hierarchical and phased. The top-level technical process is the technical process for the entire system development process, from which the development technologies at each level are derived. The entire technical process constitutes the spacecraft development technology process system.

4.3 With user requirements as the goal, ensure the quality of spacecraft design, manufacturing, and testing; simultaneously, comprehensively consider spacecraft research and development. The process must meet the requirements of schedule and cost control, taking into account both internal and external constraints in spacecraft development, such

as input conditions and resource constraints, to ensure that the process is efficient and cost-effective. It is scientific, reasonable, and economical, and meets the requirements of the mission.

4.4 Based on the spacecraft development phase and the development tasks at each phase, and according to the work objectives, selected technical approaches, and development (design) elements, comprehensively... Identify all work items in the technical process, ensuring that all work items are comprehensive and complete, and include any additions, deletions, or changes in their order in the technical status control.

4.5 Taking full account of product assurance and technical safety requirements, in addition to all technical activities including hardware and software research and development, product assurance should be included. Key work items and technical safety key work items (quality control points and technical safety critical control points) are incorporated into the spacecraft development technology flow. During the process.

4.6 It should be consistent with the content of each stage of spacecraft development, reflecting the logical sequence of work project completion, but not showing the process of work project completion. The cross-iteration relationship in the text.

4.7 Identify the milestones for each development stage, with key milestones serving as technical process milestones, and formulate guarantees for completing each work milestone. condition.

4.8 The current level's process only reflects the main technical activities at this level and the key lower-level activities of concern to this level. Lower-level technical processes are reflected in the higher-level process. The details are refined under the constraints, with appropriate emphasis.

5. Basis for Compilation The basis for this compilation is as follows:

- a) The general requirements or contract for spacecraft development and its additional terms;
- b) Overall spacecraft design;
- c) Technical processes and solutions from higher authorities;
- d) Technical solutions and test projects at this level;
- e) Standards and specifications related to spacecraft development.

6 Classification of Technical Processes

6.1 Classification by spacecraft disassembled structure According to the classification of spacecraft disassembly structures, the technical process includes.

- a) System-level technical processes (system-level technical processes at each stage of

development);

b) Subsystem-level technical processes (subsystem-level technical processes at each development stage);

c) Equipment-level technical processes (equipment-level technical processes at each stage of development).

6.2 Classification by Spacecraft Development Process According to the spacecraft development process, the technical workflow includes.

a) Complete technical workflow (the technical workflow documented from the initial feasibility study to the completion of the user-specified tasks);

b) Technical processes during the development phase (technical processes written at the system level, subsystem level, and equipment level at each development phase);

c) Specific technical processes (technical processes written at the system, subsystem, or equipment level according to the specific work items determined by the project breakdown structure). process).

7. Timing of Writing The timing of the writing is as follows:

a) The entire technical process should be completed before the project feasibility study report is reviewed.

b) The technical process during the development phase should be completed before transitioning to the conceptual design phase, prototype development phase, and final product development phase; the technical aspects of the launch site... The technical process should include pre-design phase, pre-prototype development phase, and pre-production phase, as well as factory review. Completed previously.

c) The specific technical process should be completed before the specific work begins.

8. Writing Steps The steps for writing the code are as follows:

a) Based on the development requirements, mission objectives, and constraints of each stage of spacecraft development, the overall project objective is broken down into corresponding work objectives;

9 Writing Method

9.1 General Requirements A technical process consists of three parts. a technical process diagram, a written description of the technical process, and a description of the work items within the technical process. A technical process should include... Includes all major work items, logical sequence, support conditions, key milestones, quality control points, and technologies related to the research and development activities within this level of focus. Information such as key control points for technical safety.