INTERNATIONAL STANDARD

ISO
21349

Space systems — Project reviews

Systèmes spatiaux — Revue des projets

Contents

Page

Foreword

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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 document 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).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 14, *Space systems and operations*.

This second edition cancels and replaces the first edition (ISO 21349:2007), which has been technically revised.

The main changes are as follows:

— updated normative references in Clause 2;

— updated terms and definition in Clause 3;

— deleted numerical syntax of the IDEF0 standard in Clauses 4 and 5;

— deleted information about IEEE Std. 1320.1-1998 in 4.2.1;

— minor changes in 4.3, 5.4.1, 5.4.3, 5.5.1, 5.5.3 and in Annex A;

— added ISO/TS 18667 and ISO 18676 in the Bibliography.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Space systems are very complex, incorporating many different technologies. Space programmes can last for many years, progressing through several different stages from conception to disposal or other disposition. When a space programme advances from one stage to another, substantial changes in the type and amount of resources required can occur. In addition, there can be attendant risks to either the success of the project or to the well-being of project equipment or to personnel. Well-regulated project reviews can be an important factor in ensuring that all factors are ready for these changes, and that the risks are well understood and accepted. This document is intended to be used as a basis for the activities comprising a review, their necessary resources, controls, inputs and results to enhance the communication between different organizations that participate in a review process and to reduce the costs of planning and performing reviews.

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ISO 21349:2023
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21349-2023

Space systems — Project reviews

1   Scope

This document specifies process requirements for project reviews as a set of required functions. It establishes requirements and recommendations on the function inputs, outputs, mechanisms and controlling conditions.

This document specifies the responsibilities of a review board and gives guidance concerning review board composition.

This document also provides descriptions of the kinds of reviews that are commonly useful in assuring the success of a space project.

This document is applicable to status reviews for a project at any level within a larger project, as well as for major milestone reviews at the top level of a major project. It is intended to be used either by an independent developer as a basis for enterprise processes, or as a basis for an agreement between a supplier and a customer. It is intended for use in implementing the review requirements of ISO 14300-1, and ISO 14300-2, ISO 15865 and such other space systems and operations standards that require formal reviews**.**

2   Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10795, *Space systems — Programme management and quality — Vocabulary*

ISO 17666, *Space systems — Risk management*

3   Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10795 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/.

3.1
independent expert
person highly qualified in some aspect of the technical content of the *project review* (3.7) who does not have a personal conflict of interest concerning the outcome of the review

3.2
milestone
designated project status that indicates the amount of progress made toward project completion, or that should be achieved before the project proceeds to a new phase

3.3
milestone criteria
observable facts that indicate a *milestone* (3.2) has been reached

3.4
project data files
collection of requirements, specifications, plans, technical result documentation and all other project data that serves to represent the project status

3.5
project decision authority
entity with authority to certify that the preconditions for a review are met, to initiate the review process, to reach decisions on the *review board* (3.9) recommendations and to cause the agreed project actions to be carried out

3.6
project expert
person well acquainted with the project status and documentation and highly qualified in some area of the technical content of the *project review* (3.7)

3.7
project review
formal collection and evaluation of evidence of project status, along with identifying issues and necessary corrective actions, to determine that the objectives and success criteria of a review *milestone* (3.2) have been met

3.8
project review team
body consisting of *project experts* (3.6), charged with preparing all evidence for the review and formulating responses to action items

Note 1 to entry: The best practice for conducting a review involves two separate teams of experts: the project review team and the *review board* (3.9). The project review team is composed of persons well acquainted with the project and is responsible for assembling information concerning the actual status of the project.

3.9
review board
body, organized into sub-entities, as necessary, consisting of a *review board chairperson* (3.10) or delegated person and *review board members* (3.11), charged with evaluating the evidence of project status, along with identifying issues and necessary corrective actions, to determine that the objectives and success criteria of a review *milestone* (3.2) have been met

Note 1 to entry: The purpose of the review board is to prepare an objective evaluation of the project status. Achievement of an objective evaluation is aided by use of *independent experts* (3.1) who have no prior association with the project and no personal conflict of interest with respect to the outcome of the review.

3.10
review board chairperson
leader of the *review board* (3.9), who approves the *review policy* (3.12), objectives, success criteria, organization of the review board and nomination of *review board members* (3.11)

3.11
review board member
independent expert (3.1), sometimes termed a subject matter expert, who is a participant in the *review board* (3.9)

3.12
review policy
policy that provides either requirements or guidance (or both) for the overall conduct of the review

4 General

4.1 Purpose of a review

The purpose of a project review is to establish whether the project has reached a defined project milestone and to identify specific actions necessary for the project to proceed to the next phase.

NOTE   The flow of activities to achieve this purpose is one of identifying the participants and the plan, preparing the evidence of the project status, evaluating the evidence relative to milestone criteria, followed by a preparation of specific recommendations based on the evaluation and performing actions identified by the review.

Typical milestones and their relation to space project phases are defined in ISO 14300-1, ISO 14300-2 and in Clause 6.

4.2 Process model

4.2.1 Function hierarchy

For reference, the essential features of the review process modelling syntax and semantics used in this document are summarized in Annex A.

For clarity in communicating the relationships between the review functions, the model is construed as a three-level hierarchy of functions, as shown in Figure 1. This hierarchy can be used for guidance in planning reviews; but for a conforming application of this document, use of this hierarchy to represent the process is not required.

In a conforming application, the twelve functions at the third level of the hierarchy of Figure 1 shall be implemented. Detailed requirements and guidance for these functions are given in Clause 5.
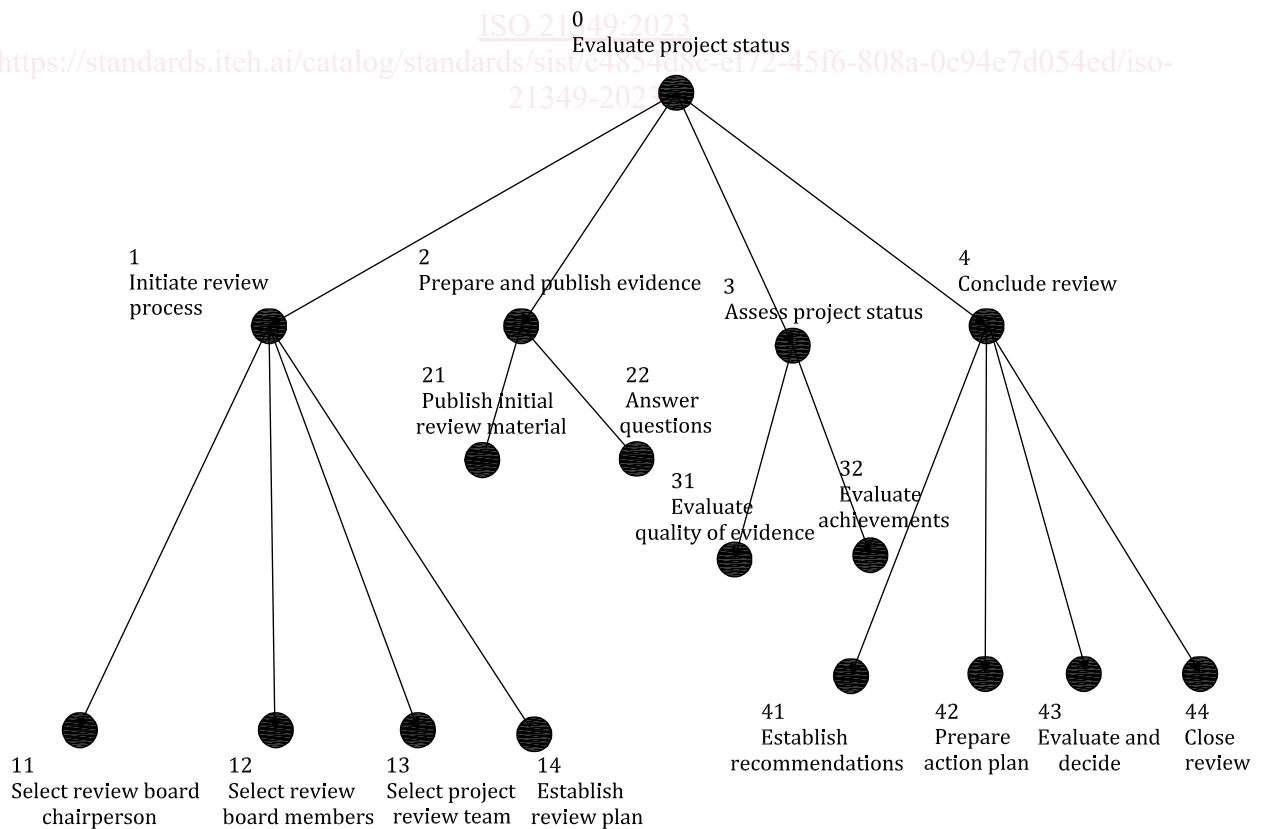

Figure 1 — Function hierarchy

4.2.2 Co-ordination of functions

A function may be performed concurrently with any other function and in any order that is appropriate, so long as the necessary inputs, controls and mechanisms are in place for the performance of the function. The performance of a function may be interrupted if this is appropriate, for example, because of resource conflicts.

In many cases the inputs, outputs and controls can consist of many increments of data or other material that are available at distributed times. Similarly, not all personnel participating in implementing a function are needed for the production of some specific increment of output. In these cases, outputs may be produced incrementally, rather than held until the total output has been completed.

4.3 Review context

The review context, corresponding to level 0 of Figure 1, is shown in Figure 2. The central box represents the function performed by the complete review process. The function of the review process, as stated in 4.1, is to evaluate project status relative to a specified project milestone. For the purposes of the diagram, this is abbreviated to "Evaluate project status". The incoming arrows at the top and bottom, and on the left of the function box represent necessary preconditions for the review to be performed. Specifically:

a) the review process is controlled by the project review policy and the milestone criteria;

b) the input to the review process is the total set of project data files;

c) the mechanism for performing the review process includes

  1) available independent experts,

  2) available project experts, and

  3) the project decision authority.

Requirements for these preconditions are given in 4.4.

The concrete result of the review is an agreed report of conclusions, recommendations and action items, and an approved plan for resolving any remaining problems. These outputs are shown on the right of the function box in Figure 2. Requirements for these outputs are given in 5.5.

Models in general include factors that are important from a certain viewpoint. The review process model used in this document uses the viewpoint of project management.
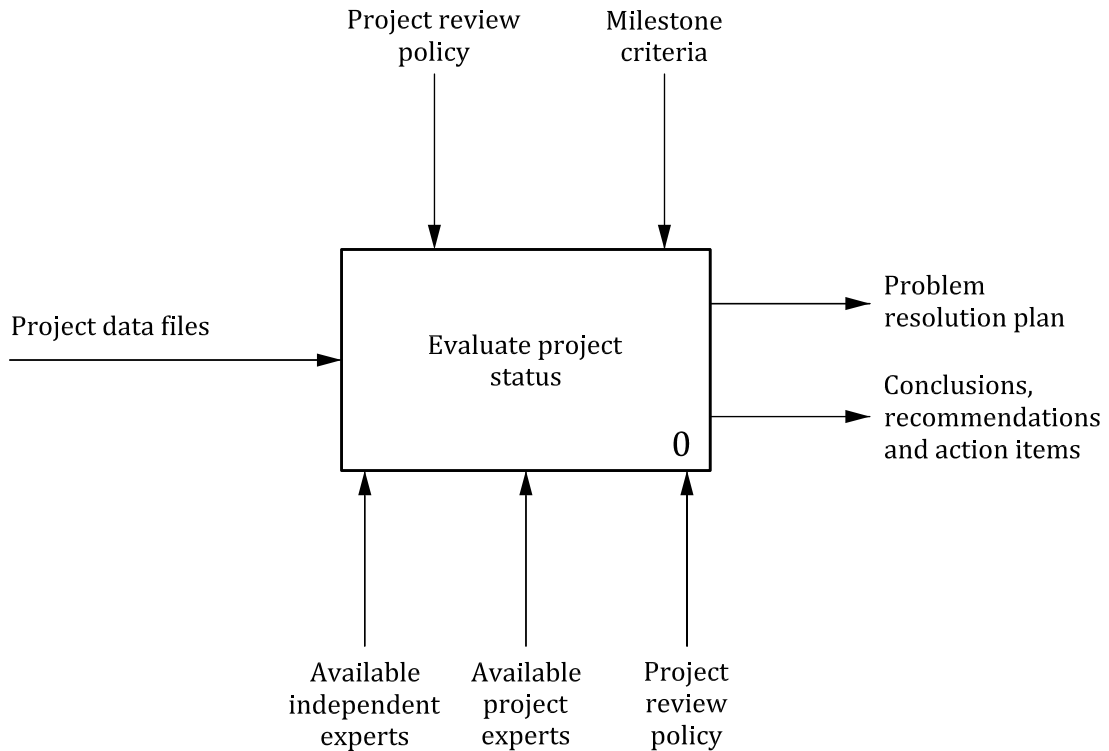
Figure 2 — Context diagram for the top-level function "Evaluate project status"

4.4 Preconditions for a review

4.4.1 General preconditions

4.4.1.1 Project review policy

The project shall have a review policy. Factors that should be considered for inclusion in the review policy include the following:

a) selection of review board chairperson and review board members;

b) qualifications of review board members;

c) number of review board members and distribution of technical expertise;

d) style, format and medium of review publications, presentations and responses;

e) rules of order for conduct of meetings;

f) rules and procedures for the review board to reach recommendations;

g) rules and procedures for reaching decisions which involve both the project decision authority and the review board;

h) selection of members of the project review team;

i) establishment of a review plan.

4.4.1.2 Project decision authority

The project decision authority for the review shall be identified.