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Systems and software engineering — Life cycle management —

Part 4: Systems engineering management planning

Ingénierie des systèmes et du logiciel — Gestion du cycle de vie — Partie 4: Planification de la gestion de l'ingénierie des systèmes

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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 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 or www.iec.ch/members_experts/refdocs).

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*, in cooperation with the Systems and Software Engineering Standards Committee of the IEEE Computer Society, under the Partner Standards Development Organization cooperation agreement between ISO and IEEE.

This second edition cancels and replaces the first edition (ISO/IEC/IEEE 24748-4:2016), which has been technically revised.

The main changes are as follows:

— aligns with updates to ISO/IEC/IEEE 15288:2023, ISO/IEC/IEEE 24748-1:2024, ISO/IEC/IEEE 24748-2:2024, ISO/IEC/IEEE 16085:2021, and ISO/IEC/IEEE 29148:2018;

— streamlines and reduces redundancies from the publication of ISO/IEC/IEEE 16326:2019;

— maintains harmonization with new documents within the SC 7 portfolio, including ISO/IEC/IEEE 15289, ISO/IEC/IEEE 15939, ISO/IEC/IEEE 21839, ISO/IEC/IEEE 21840, ISO/IEC/IEEE 21841, ISO/IEC/IEEE 24748-7 and ISO/IEC/IEEE 24748-8;

— addresses feedback from users and the advancement of system-related technologies, including systems of systems and model-based systems and software engineering;

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— adds a new annex with an expanded process view for systems engineering management planning;

— adds a new annex with example information item content mapping tables;

— removes provisions for conformance to process.

A list of all parts in the ISO/IEC/IEEE 24748 series can be found on the ISO and IEC websites.

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 and www.iec.ch/national-committees.

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Introduction

ISO/IEC/IEEE 15288 provides a common process framework covering the life cycle of human-made systems, from the conception of ideas through to the retirement of a system. It provides the processes for acquiring and supplying systems. In addition, this framework provides for the assessment and improvement of the life cycle processes. This common framework improves communication and cooperation among the parties that create, utilize, and manage modern systems in order that they can work in an integrated, coherent fashion.

The acquisition or supply of a system is usually done within a project. A project prepares and implements the technical planning, resources and schedules necessary to guide the project toward accomplishment of its objectives and proper conclusion. The project's authorization and objectives are documented in an information item typically identified as a systems engineering management plan (SEMP).

This document defines a SEMP as the key vehicle for representing a project's application of systems life cycle processes. In this document, the terms technical planning and systems engineering (SE) planning are used interchangeably to emphasize or differentiate technical contributions in the processes under discussion.

In many organizations, the various responsibilities of technical management are assigned to more than one person. Where the term "technical manager" or "systems engineering manager" is used in this document, the guidance, advice or normative requirement applies to the applicable role within the project or organization.

NOTE ISO/IEC/IEEE 24748-1 and ISO/IEC/IEEE 24748-2 provide guidance on the application of ISO/IEC/IEEE 15288, including definition or expansion of important organization, project, process, and life cycle model concepts and their adaptation for successful project implementation.

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Systems and software engineering — Life cycle management —

Part 4: Systems engineering management planning

1 Scope

This document:

— provides an expanded view of the processes from ISO/IEC/IEEE 15288 that implement systems engineering (SE) management for the life cycles of technical solutions;

— describes a required information item, termed the systems engineering management plan (SEMP) for the technical management and execution of the SE of technical solutions,

— provides requirements and guidance for the content of the required information item.

This document is applicable to:

— those who use or plan to use ISO/IEC/IEEE 15288 on projects dealing with human-made systems, products and services;

— those who are responsible for the technical management of projects concerned with the engineering of systems;

— those responsible for planning or executing ISO/IEC/IEEE 15288 system life cycle processes at a project level;

— organizations and individuals involved with a technical project management effort;

— anyone developing engineering management documentation to complete technical planning aspects of their project's processes.

This document is intended to provide guidance for two-party situations and can be equally applied where the two parties are from the same organization. This document can also be used by a single party as self-imposed tasks.

This document can also serve as guidance in multi-party situations, where high risks are inherent in the supply and integration of complex systems, and procurement can involve several suppliers, organizations or parties.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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ISO, IEC and IEEE 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/

— IEEE Standards Dictionary Online: available at https://ieeexplore.ieee.org/xpls/dictionary.jsp

NOTE For additional terms and definitions in the field of systems and software engineering, see ISO/IEC/IEEE 24765, which is published periodically as a "snapshot" of the SEVOCAB (Systems and software Engineering Vocabulary) database and which is publicly accessible at http://www.computer.org/sevocab.

3.1.1
audit
systematic, independent and documented process for obtaining objective evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled

[SOURCE: ISO 9000:2015, 3.13.1, modified — Notes to entry have been removed.]

3.1.2
include
<information> has either the information or a reference to the information

[SOURCE: ISO/IEC/IEEE 15289:2019, 3.1.11]

3.1.3
information item
separately identifiable body of information that is produced, stored, and delivered for human use

Note 1 to entry: A document produced to meet information requirements can be an information item, part of an information item, or a combination of several information items.

Note 2 to entry: An information item can be produced in several versions during a project or system life cycle.

[SOURCE: ISO/IEC/IEEE 15289:2019, 3.1.12]

3.1.4
measure of effectiveness
MoE
measures that define the acquirer's key indicators of achieving the mission needs for performance, suitability and affordability across the life cycle

[SOURCE: INCOSE Systems Engineering Handbook, 5th ed., © 2023 John Wiley & Sons Ltd. Used with permission.]

3.1.5
measure of performance
MoP
measure to assess whether the system meets design or performance requirements and has the capability to achieve operational objective

[SOURCE: INCOSE Systems Engineering Handbook, 5th ed., © 2023 John Wiley & Sons Ltd. Used with permission.]

3.1.6
plan
information item (3.1.3) that presents a systematic course of action for achieving a declared purpose, including when, how, and by whom specific activities are to be performed

[SOURCE: ISO/IEC/IEEE 15289:2019, 3.1.16]

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3.1.7
systems engineering management plan
SEMP
top-level technical *plan* (3.1.6) for managing the systems engineering effort which defines how the technical aspects of the project will be organized, structured, and conducted and how the systems life cycle processes will be controlled to provide a product that satisfies stakeholder requirements

Note 1 to entry: An alternate title, such as a systems engineering plan (SEP), can be used.

Note 2 to entry: The content of the SEMP can be incorporated into another plan such as a single integrated engineering management plan (IEMP) that includes other management plans such as project, configuration management and risk.

Note 3 to entry: The content of the SEMP can be distributed across multiple plans.

Note 4 to entry: This document does not prescribe the form of the *information item* (3.1.3). The content of the SEMP can be in the form of documents or models or other form(s) appropriate to the context of the project.

3.1.8
technical performance measure
TPM
measure to assess design progress, compliance to performance requirements, or technical risks and provide visibility into the status of important technical parameters to enable effective management, thus enhancing the likelihood of achieving the technical objectives of the project

[SOURCE: INCOSE Systems Engineering Handbook, 5th ed., © 2023 John Wiley & Sons Ltd. Used with permission.]

3.2 Abbreviated terms

CS	constituent system
DE	digital engineering
INCOSE	International Council on Systems Engineering
MBSE	model-based systems engineering
MBSSE	model-based system and software engineering
PMP	project management plan
PLM	product life cycle management
QA	quality assurance
SE	systems engineering
SEP	systems engineering plan
SoI	system of interest
SoS	system of systems
WBS	work breakdown structure

4 Conformance

4.1 Intended usage

This document provides guidance for the execution of the ISO/IEC/IEEE 15288 processes related to the planning and managing a project to implement a significant technical effort. This document also provides

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