

Australian/New Zealand Standard™

**Systems and software engineering—
Software life cycle processes**



AS/NZS ISO/IEC 12207:2013

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee IT-015, Software and System Engineering. It was approved on behalf of the Council of Standards Australia on 7 November 2013 and on behalf of the Council of Standards New Zealand on 31 October 2013.
This Standard was published on 18 December 2013.

The following are represented on Committee IT-015:

Australian Computer Society
Australian Society for Technical Communication, NSW
Charles Sturt University
Department of Defence, Australia
Griffith University
Institute of IT Professionals New Zealand
La Trobe University
National Association of Testing Authorities Australia
National ICT Australia
New Zealand Organisation for Quality
NSW Business Chamber Limited
Quantitative Enterprise Software Performance
Systems Engineering Society of Australia
University of Technology, Sydney

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at www.saiglobal.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR AS/NZS ISO/IEC 12207.

Australian/New Zealand Standard™

**Systems and software engineering—
Software life cycle processes**

Originated as AS/NZS ISO/IEC 12207:1997.
Second edition 2013.

COPYRIGHT

© Standards Australia Limited/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Australia) or the Copyright Act 1994 (New Zealand).

Jointly published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001 and by Standards New Zealand, Private Bag 2439, Wellington 6140.

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT-015, Software and System Engineering.

The objective of this Standard is to provide the foundation to facilitate evolution to an integrated and fully harmonized treatment of software life cycle processes.

This Standard is identical with, and has been reproduced from ISO/IEC 12207:2008, *Systems and software engineering—Software life cycle processes*.

As this Standard is reproduced from an International Standard, the following applies:

- (a) In the source text ISO/IEC 12207 should read this Australian/New Zealand Standard.
- (b) A full point substitutes for a comma when referring to a decimal marker.

None of the normative references in the source document have been adopted as Australian or Australian/New Zealand Standards.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annex to which they apply. A ‘normative’ annex is an integral part of a Standard, whereas an ‘informative’ annex is only for information and guidance.

CONTENTS

1	Overview	1
1.1	Scope	1
1.2	Purpose.....	1
1.3	Limitations	1
2	Conformance.....	2
2.1	Intended usage.....	2
2.2	Full conformance	2
2.3	Tailored conformance	2
3	Normative references	2
4	Terms and definitions.....	3
5	Application of this International Standard	9
5.1	Key concepts of this International Standard	9
5.1.1	Relationship of software products and software services.....	9
5.1.2	Relationship between systems and software	9
5.1.3	Organizations and parties.....	10
5.1.4	Organization-level and project-level adoption.....	10
5.1.5	Tailoring	11
5.1.6	Temporal relationships among the processes	11
5.1.7	Evaluation versus verification, and validation	11
5.1.8	Criteria for processes.....	11
5.1.9	Description of processes	11
5.1.10	General Characteristics of processes	12
5.1.11	Decomposition of processes.....	12
5.1.12	Life cycle models and stages	12
5.2	Organization of this International Standard.....	13
5.2.1	Categories of Life Cycle Processes	13
5.2.2	Summary of Life Cycle Processes	14
5.2.3	Process Reference Model	18
6	System Life Cycle Processes	18
6.1	Agreement Processes	18
6.1.1	Acquisition Process	18
6.1.2	Supply Process	22
6.2	Organizational Project-Enabling Processes	25
6.2.1	Life Cycle Model Management Process	25
6.2.2	Infrastructure Management Process	26
6.2.3	Project Portfolio Management Process.....	27
6.2.4	Human Resource Management Process	29
6.2.5	Quality Management Process.....	31
6.3	Project Processes.....	32
6.3.1	Project Planning Process	32
6.3.2	Project Assessment and Control Process	33
6.3.3	Decision Management Process	34
6.3.4	Risk Management Process	36
6.3.5	Configuration Management Process	38
6.3.6	Information Management Process	39
6.3.7	Measurement Process.....	41
6.4	Technical Processes	42
6.4.1	Stakeholder Requirements Definition Process	42
6.4.2	System Requirements Analysis Process	45
6.4.3	System Architectural Design Process.....	46

6.4.4	Implementation Process	47
6.4.5	System Integration Process	47
6.4.6	System Qualification Testing Process	48
6.4.7	Software Installation Process	50
6.4.8	Software Acceptance Support Process	51
6.4.9	Software Operation Process	51
6.4.10	Software Maintenance Process.....	53
6.4.11	Software Disposal Process	56
7	Software Specific Processes.....	57
7.1	Software Implementation Processes.....	57
7.1.1	Software Implementation Process.....	57
7.1.2	Software Requirements Analysis Process	59
7.1.3	Software Architectural Design Process	60
7.1.4	Software Detailed Design Process	61
7.1.5	Software Construction Process	63
7.1.6	Software Integration Process.....	64
7.1.7	Software Qualification Testing Process.....	65
7.2	Software Support Processes.....	66
7.2.1	Software Documentation Management Process.....	66
7.2.2	Software Configuration Management Process.....	68
7.2.3	Software Quality Assurance Process.....	69
7.2.4	Software Verification Process.....	71
7.2.5	Software Validation Process	73
7.2.6	Software Review Process	74
7.2.7	Software Audit Process	76
7.2.8	Software Problem Resolution Process	77
7.3	Software Reuse Processes.....	78
7.3.1	Domain Engineering Process.....	78
7.3.2	Reuse Asset Management Process	80
7.3.3	Reuse Program Management Process.....	82
Annex A	(normative) Tailoring Process	85
A.1	Introduction.....	85
A.2	Tailoring Process	85
A.2.1	Purpose of the Tailoring Process	85
A.2.2	Tailoring Process outcomes	85
A.2.3	Tailoring Process activities	85
Annex B	(normative) Process Reference Model (PRM) for Assessment Purposes.....	87
B.1	Introduction.....	87
B.2	Conformance with ISO/IEC 15504-2.....	87
B.2.1	General	87
B.2.2	Requirements for Process Reference Models.....	87
B.2.3	Process descriptions	88
B.3	Process Reference Model.....	90
B.3.1	Acquisition Process Lower-Level Processes.....	91
B.3.2	Supply Process Lower-Level Processes	93
B.3.3	Life Cycle Model Management Process Lower-Level Processes.....	94
B.3.4	Human Resource Management Process Lower-Level Processes.....	96
B.3.5	Software Operation Process Lower-Level Processes	97
Annex C	(informative) History and rationale	99
C.1	Introduction.....	99
C.2	History	99
C.3	Goals	99
C.4	Process constructs and their usage	100
C.5	Relations among version of standards	101
Annex D	(informative) ISO/IEC 12207 and ISO/IEC 15288 process alignment.....	105
Annex E	(informative) Process views	107
E.1	Introduction.....	107
E.2	Definition	107

E.3	The process view concept	107
E.3.1	Process viewpoint	107
E.4	Process view for usability	108
Annex F	(informative) Some example process descriptions	110
F.1	Organizational Alignment Process	110
F.1.1	Purpose	110
F.1.2	Outcomes	110
F.2	Organization Management Process	110
F.2.1	Purpose	110
F.2.2	Outcomes	110
F.3	Contract Change Management Process	111
F.3.1	Purpose	111
F.3.2	Outcomes	111
F.3.3	Activities and tasks	111
Annex G	(informative) Relationship to other IEEE standards	113
Annex H	(informative) Bibliography	120
Annex I	(informative) List of participants	122

INTRODUCTION

ISO/IEC 12207 was published on 1 August 1995 and was the first International Standard to provide a comprehensive set of life cycle processes, activities and tasks for software that is part of a larger system, and for stand alone software products and services. That International Standard was followed in November 2002 by ISO/IEC 15288 which addressed system life cycle processes. The ubiquity of the software meant that the software and its design processes should not be considered separately from those systems, but be considered as an integral part of the system and system design processes. The ISO/IEC 12207 Amendments in 2002 and 2004 added process purpose and outcomes to the International Standard and established a Process Reference Model in accordance with the requirements of ISO/IEC 15504-2.

This International Standard, a revision of the amended ISO/IEC 12207, is an initial step in the SC7 harmonization strategy to achieve a fully integrated suite of system and software life cycle processes and guidance for their application.

This revision integrates ISO/IEC 12207:1995 with its two Amendments and applies SC7 guidelines for process definition to support consistency and improved usability. Project execution was carefully coordinated with the parallel revision of ISO/IEC 15288:2002 to align structure, terms, and corresponding organizational and project processes.

This International Standard can be used in one or more of the following modes:

- By an organization — to help establish an environment of desired processes. These processes can be supported by an infrastructure of methods, procedures, techniques, tools and trained personnel. The organization may then employ this environment to perform and manage its projects and progress systems through their life cycle stages. In this mode this International Standard is used to assess conformance of a declared, established set of life cycle processes to its provisions.
- By a project — to help select, structure and employ the elements of an established set of life cycle processes to provide products and services. In this mode this International Standard is used in the assessment of conformance of the project to the declared and established environment.
- By an acquirer and a supplier — to help develop an agreement concerning processes and activities. Via the agreement, the processes and activities in this International Standard are selected, negotiated, agreed to and performed. In this mode this International Standard is used for guidance in developing the agreement.
- By organizations and assessors — to perform assessments that may be used to support organizational process improvement.

This International Standard contains requirements in four Clauses: Clause 6, which defines the requirements for the system life cycle processes, Clause 7, which defines the requirements for specific software life cycle processes, clauses of Annex A, which provides requirements for tailoring of this International Standard and clauses of Annex B, which provides a Process Reference Model (PRM) which may be used for assessment purposes.

Five informative annexes support the harmonization strategy initiated by this revision.

- Annex C expands on history and rationale for the changes, and provides high-level traceability among the International Standards which were used as the inputs to this revision.
- Annex D describes the alignment of the processes of ISO/IEC 15288 and ISO/IEC 12207 — a key focus of this revision.
- Annex E provides an example of a process view for Usability, intended to illustrate how a project might assemble processes, activities and tasks of ISO/IEC 12207 to provide focused attention to the achievement of product characteristics that have been selected as being of special interest.

- Annex F contains some example process descriptions that are considered useful to some readers of this International Standard.
- Annex G provides support for IEEE users and describes relationships of this International Standard to IEEE standards.

Readers of this International Standard are advised to consult Clause 5 to gain understanding of the key concepts used.

NOTE A future Technical Report (ISO/IEC TR 24748) will describe the relations between this International Standard and ISO/IEC 15288:2008.

AUSTRALIAN/NEW ZEALAND STANDARD

Systems and software engineering—Software life cycle processes**1 Overview****1.1 Scope**

This International Standard establishes a common framework for software life cycle processes, with well-defined terminology, that can be referenced by the software industry. It contains processes, activities, and tasks that are to be applied during the acquisition of a software product or service and during the supply, development, operation, maintenance and disposal of software products. Software includes the software portion of firmware.

This International Standard applies to the acquisition of systems and software products and services, to the supply, development, operation, maintenance, and disposal of software products and the software portion of a system, whether performed internally or externally to an organization. Those aspects of system definition needed to provide the context for software products and services are included.

This International Standard also provides a process that can be employed for defining, controlling, and improving software life cycle processes.

The processes, activities and tasks of this International Standard—either alone or in conjunction with ISO/IEC 15288—may also be applied during the acquisition of a system that contains software.

1.2 Purpose

The purpose of this International Standard is to provide a defined set of processes to facilitate communication among acquirers, suppliers and other stakeholders in the life cycle of a software product.

This International Standard is written for acquirers of systems and software products and services and for suppliers, developers, operators, maintainers, managers, quality assurance managers, and users of software products.

This International Standard is intended for use in a two-party situation and may be equally applied where the two parties are from the same organization. The situation may range from an informal agreement up to a legally binding contract. The International Standard may be used by a single party through a self-imposed set of processes. This clause does not prevent the use of ISO/IEC 12207 by suppliers or developers of off-the-shelf software.

1.3 Limitations

This International Standard does not detail the life cycle processes in terms of methods or procedures required to meet the requirements and outcomes of a process.

This International Standard does not detail documentation in terms of name, format, explicit content and recording media. The International Standard may require development of documents of similar class or type; various plans are an example. The International Standard, however, does not imply that such documents be developed or packaged separately or combined in some fashion. These decisions are left to the user of the International Standard.

NOTE ISO/IEC 15289 addresses the content for life cycle process information items (documentation).

This International Standard does not prescribe a specific system or software life cycle model, development methodology, method, model or technique. The parties of the International Standard are responsible for