TECHNICAL REPORT

ISO/IEC TR 90005

First edition
2008-07-15

Systems engineering — Guidelines for the application of ISO 9001 to system life cycle processes

Ingénierie des systèmes — Lignes directrices pour l'application de l'ISO 9001 aux processus de cycle de vie des systèmes

Reference number
ISO/IEC TR 90005:2008(E)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

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. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

In exceptional circumstances, the joint technical committee may propose the publication of a Technical Report of one of the following types:

— type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;

— type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;

— type 3, when the joint technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC TR 90005, which is a Technical Report of type 3, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software and systems engineering*.

Introduction

This Technical Report has been prepared based on a number of concepts.

1. **Enterprise versus Project –** ISO/IEC 15288 uses the term **Enterprise** to represent the organization within which **projects** are conducted using the system life cycle processes defined. It mainly considers the processes that provide support and resources to projects rather than an exhaustive set of processes that cover all aspects of the organization's business. ISO 9001:2000 does not use the term project but focuses on what an organization needs to do to satisfy customer requirements through **product realization**. It is possible to interpret a project in ISO 9001:2000 as either instantiated through the management processes or as an instance of product realization. This Technical Report therefore includes references to Clause 5 (Management in ISO 9001:2000) and Clause 7 (Product realization) in many cases as alternative ways to interpret ISO 9001:2000.

2. **Rationale & Explanation –** Each activity in ISO/IEC 15288 is discussed in terms of how it relates to sections of ISO 9001:2000. In many cases there is not a single section of ISO 9001 but a combination of sections that cover this relationship. Where possible only the sentence or sentences that deal with the relationship are stated rather than the complete section or clause from ISO 9001:2000. However, the reference to an ISO 9001:2000 clause number is normally to a complete clause unless a precise bullet or subclause covers the requirement explicitly.

3. **Outcomes –** Since for the most part ISO 9001:2000 does not cover outcomes, these are not discussed in this Technical Report and are omitted from the ISO/IEC 15288 text column. In any case the outcomes are the results of the activities specified, so this treatment does not miss any requirements.

4. **Other missing sections of ISO/IEC 15288 –** The purpose of each process is included in the Rationale/explanation section rather than in the ISO/IEC 15288 text section for ease of referencing. Notes in ISO/IEC 15288 are excluded because they contain no activities (requirements). The sections describing the contents of ISO/IEC 15288 and those discussing systems are omitted since there is no similar content in ISO 9001:2000.

5. **4.1 Quality management system – General requirements –** This section in ISO 9001:2000 is not generally used as a reference relationship to ISO/IEC 15288 because it is a summary of the requirements specified in 4.2 and Clauses 5 to 8 of ISO 9001:2000. To include it would have meant many cross-references to 4.1 and duplication of the specific sections where the precise requirement is specified. However in 5.2.2.3 f) of ISO/IEC 15288:2002, 4.1 of ISO 9001:2000 is used to cover outsourced processes since this is the only part of ISO 9001:2000 that describes outsourced processes.

6. **Other items in ISO 9001:2000 not referenced –** There are a few items in ISO 9001 where no relationship to ISO/IEC 15288 could be found. These are listed in a separate table at the back of this Technical Report for completeness.

7. **Intended use of this Technical Report –** This Technical Report has been prepared to enable a reader who is interested in comparing or contrasting the different treatment of systems in ISO/IEC 15288 and ISO 9001:2000 to quickly find the relationship and understand why a particular relationship is cited by way of the rationale and explanation text. It does not try to explain why a particular requirement exists in either International Standard.

It identifies the issues that should be addressed and is independent of the technology, life cycle models, development processes, sequence of activities and organizational structure used by an organization. The guidance and identified issues are intended to be comprehensive but not exhaustive. Where the scope of an organization's activities includes areas other than system development, the relationship between the computer system elements of that organization's quality management system and the remaining aspects should be clearly documented within the quality management system as a whole.

Clauses 4, 5 and 6 and parts of Clause 8 of ISO 9001:2000 are applied mainly at the “global” level in the organization, although they do have some effect at the “project/product level”. Each project or product development may tailor the associated parts of the organization's quality management system to suit project/product-specific requirements.

Throughout ISO/IEC 15288, “shall” is used to express a provision that is binding between two or more parties, “should” to express a recommendation among possibilities and “may” to indicate a course of action permissible within the limits of ISO 9001:2000. On the other hand, ISO 9001:2000 uses only “shall” to express a provision that is binding between two or more parties. In this Technical Report, “should” and “may” have the same meaning as stated above, i.e. “should" to express a recommendation among possibilities and “may” to indicate a course of action permissible within the limits of ISO 9001:2000 and ISO/IEC 15288. Organizations with quality management systems for developing, operating or maintaining systems based on this Technical Report may choose to use processes from ISO/IEC 15288 and ISO/IEC 12207 to support or complement the ISO 9001:2000 process model.

Systems engineering — Guidelines for the application of ISO 9001 to system life cycle processes

1 Scope

This Technical Report provides guidance for organizations in the application of ISO 9001:2000 to the acquisition, supply, development, operation and maintenance of systems and related support services. It does not add to or otherwise change the requirements of ISO 9001:2000. The guidelines provided in this Technical Report are not intended to be used as assessment criteria in quality management system registration or certification.

1.1 Purpose

This Technical Report adopts ISO/IEC 15288 systems life cycle processes as a starting point for system development, operation or maintenance and identifies those equivalent requirements in ISO 9001:2000 that have a bearing on the implementation of ISO/IEC 15288.

1.2 Field of Application

The application of this Technical Report is appropriate to systems that are

— part of a commercial contract with another organization,

— a product available for a market sector,

— used to support the processes of an organization,

— embedded in a hardware product, or

— related to software services.

Some organizations may be involved in all of the above activities; others may specialize in one area. Whatever the situation, the organization's quality management system should cover all aspects (system related and non-system related) of the business.

1.3 Limitations

This Technical Report provides guidance for software intensive systems. For guidance in software development, operation and maintenance see the companion document ISO/IEC 90003.