

This is a preview of "ISO/TS 22163:2017". [Click here to purchase the full version from the ANSI store.](#)

First edition
2017-05

Railway applications — Quality management system — Business management system requirements for rail organizations: ISO 9001:2015 and particular requirements for application in the rail sector

Applications ferroviaires — Système de management de la qualité — Exigences liées au système de management de l'activité à destination des organismes ferroviaires: ISO 9001:2015 et exigences particulières concernant les applications dans le secteur ferroviaire



Reference number
ISO/TS 22163:2017(E)

© ISO 2017



COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

This is a preview of "ISO/TS 22163:2017". [Click here to purchase the full version from the ANSI store.](#)

Contents

	Page
Foreword	vi
0 Introduction	vii
1 Scope	1
1.1 Scope — Supplemental.....	1
2 Normative references	2
3 Terms and definitions	2
3.1 Terms and definitions for the rail sector.....	2
3.2 Abbreviations.....	7
4 Context of the organization	8
4.1 Understanding the organization and its context.....	8
4.2 Understanding the needs and expectations of interested parties.....	8
4.3 Determining the scope of the quality management system.....	9
4.4 Quality management system and its processes.....	10
4.4.3 Quality management system and its processes — Supplemental.....	10
5 Leadership	11
5.1 Leadership and commitment.....	11
5.1.1 General.....	11
5.1.2 Customer focus.....	11
5.2 Policy.....	12
5.2.1 Establishing the quality policy.....	12
5.2.2 Communicating the quality policy.....	12
5.2.3 Quality policy — Supplemental.....	12
5.2.4 Safety policy.....	12
5.3 Organizational roles, responsibilities and authorities.....	13
5.3.1 Organizational roles, responsibilities and authorities — Supplemental.....	13
5.3.2 Responsibilities and authorities of process owners.....	13
6 Planning	14
6.1 Actions to address risks and opportunities.....	14
6.1.3 Actions to address risks and opportunities — Supplemental.....	14
6.1.4 Contingency planning.....	15
6.2 Quality objectives and planning to achieve them.....	15
6.3 Planning of changes.....	16
6.4 Business planning.....	16
7 Support	17
7.1 Resources.....	17
7.1.1 General.....	17
7.1.2 People.....	17
7.1.3 Infrastructure.....	18
7.1.4 Environment for the operation of processes.....	18
7.1.5 Monitoring and measuring resources.....	18
7.1.6 Organizational knowledge.....	20
7.2 Competence.....	21
7.2.1 Competence — Supplemental.....	21
7.3 Awareness.....	22
7.3.1 Awareness — Supplemental.....	22
7.4 Communication.....	22
7.5 Documented information.....	23
7.5.1 General.....	23
7.5.2 Creating and updating.....	23
7.5.3 Control of documented information.....	24
8 Operation	25

This is a preview of "ISO/TS 22163:2017". [Click here to purchase the full version from the ANSI store.](#)

8.1	Operational planning and control	25
8.1.1	Planning for the outsourcing or transfer of processes.....	25
8.1.2	Tender management.....	26
8.1.3	Project management.....	26
8.1.4	Configuration management.....	30
8.1.5	Change management.....	31
8.2	Requirements for products and services	33
8.2.1	Customer communication.....	33
8.2.2	Determining the requirements related to products and services.....	33
8.2.3	Review of requirements related to products and services.....	34
8.2.4	Changes to requirements for products and services.....	34
8.2.5	Requirements for products and services — Supplemental	34
8.3	Design and development of products and services.....	35
8.3.1	General.....	35
8.3.2	Design and development planning.....	36
8.3.3	Design and development inputs.....	37
8.3.4	Design and development controls.....	38
8.3.5	Design and development outputs.....	40
8.3.6	Design and development changes.....	41
8.4	Control of externally provided processes, products and services.....	41
8.4.1	General.....	41
8.4.2	Type and extent of control.....	44
8.4.3	Information for external providers.....	46
8.4.4	Supply chain management.....	47
8.5	Production and service provision.....	48
8.5.1	Control of production and service provision.....	48
8.5.2	Identification and traceability.....	51
8.5.3	Property belonging to customers or external providers.....	52
8.5.4	Preservation.....	52
8.5.5	Post-delivery activities.....	53
8.5.6	Control of changes.....	54
8.5.7	Production scheduling.....	54
8.6	Release of products and services.....	55
8.6.1	Release of products and services — Supplemental.....	55
8.7	Control of nonconforming outputs.....	56
8.7.3	Control of nonconforming outputs — Supplemental.....	56
8.8	RAMS / LCC.....	57
8.9	First article inspection.....	58
8.10	Obsolescence management.....	58
8.11	Innovation management.....	59
9	Performance evaluation	59
9.1	Monitoring, measurement, analysis and evaluation.....	59
9.1.1	General.....	59
9.1.2	Customer satisfaction.....	61
9.1.3	Analysis and evaluation.....	61
9.2	Internal audit.....	62
9.2.3	Internal audit — Supplemental.....	62
9.3	Management review.....	63
9.3.1	General.....	63
9.3.2	Management review inputs.....	64
9.3.3	Management review outputs.....	65
9.4	Process reviews.....	65
10	Improvement.....	66
10.1	General.....	66
10.2	Nonconformity and corrective action.....	67
10.2.3	Nonconformity and corrective action — Supplemental.....	67
10.3	Continual improvement.....	68

This is a preview of "ISO/TS 22163:2017". [Click here to purchase the full version from the ANSI store.](#)

Bibliography 69

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 269, *Railway applications*.

The aim of this document, which has been prepared by UNIFE, the European Rail Industry Association, is the development and continual improvement of a business management system to ensure product quality and safety in the global rail sector.

The content inside the boxed text of this document is ISO 9001:2015 text. The text outside the boxes has been originated by the UNIFE, IRIS Certification™ working group.

Whenever the ISO 9001:2015 text in this document refers to "quality management system", this term is understood hereinafter as "business management system", not limited to quality, so that it encompasses all business processes of the organization. Therefore, in the supplemental rail sector specific requirements, the term "business management system" is used outside the boxed text.

Whenever the ISO 9001:2015 text refers to "this International Standard", this applies to this document, including the text outside the boxes.

Whenever this document refers to clause numbers, it is to be understood that all the requirements under this clause including sub-clauses are to be considered.

Whenever this document refers to "safety", the term is to be understood as "product safety", not to be confused with "occupational safety".

Whenever the ISO 9001:2015 text in this document refers to "quality policy" or "quality objectives" these terms apply to "safety policy" or "safety objectives" accordingly.

Whenever this document requires documented processes (e.g. calibration and production), these processes can be defined within a single documented process (e.g. both defined within a "production management" process).

This is a preview of "ISO/TS 22163:2017". [Click here to purchase the full version from the ANSI store.](#)

0 Introduction

0.1 General

ISO 9001:2015, Quality management systems — Requirements

0.1 General

The adoption of a quality management system is a strategic decision for an organization that can help to improve its overall performance and provide a sound basis for sustainable development initiatives.

The potential benefits to an organization of implementing a quality management system based on this International Standard are:

- a) the ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements;
- b) facilitating opportunities to enhance customer satisfaction;
- c) addressing risks and opportunities associated with its context and objectives;
- d) the ability to demonstrate conformity to specified quality management system requirements.

This International Standard can be used by internal and external parties.

It is not the intent of this International Standard to imply the need for:

- uniformity in the structure of different quality management systems;
- alignment of documentation to the clause structure of this International Standard;
- the use of the specific terminology of this International Standard within the organization.

The quality management system requirements specified in this International Standard are complementary to requirements for products and services.

This International Standard employs the process approach, which incorporates the Plan-Do-Check-Act (PDCA) cycle and risk-based thinking.

The process approach enables an organization to plan its processes and their interactions.

The PDCA cycle enables an organization to ensure that its processes are adequately resourced and managed, and that opportunities for improvement are determined and acted on.

Risk-based thinking enables an organization to determine the factors that could cause its processes and its quality management system to deviate from the planned results, to put in place preventive controls to minimize negative effects and to make maximum use of opportunities as they arise (see Clause A.4).

This is a preview of "ISO/TS 22163:2017". [Click here to purchase the full version from the ANSI store.](#)

Consistently meeting requirements and addressing future needs and expectations poses a challenge for organizations in an increasingly dynamic and complex environment. To achieve this objective, the organization might find it necessary to adopt various forms of improvement in addition to correction and continual improvement, such as breakthrough change, innovation and re-organization.

In this International Standard, the following verbal forms are used:

- “shall” indicates a requirement;
- “should” indicates a recommendation;
- “may” indicates a permission;
- “can” indicates a possibility or a capability.

Information marked as “NOTE” is for guidance in understanding or clarifying the associated requirement.

0.2 Quality management principles

ISO 9001:2015, Quality management systems — Requirements

0.2 Quality management principles

This International Standard is based on the quality management principles described in ISO 9000. The descriptions include a statement of each principle, a rationale of why the principle is important for the organization, some examples of benefits associated with the principle and examples of typical actions to improve the organization’s performance when applying the principle.

The quality management principles are:

- customer focus;
- leadership;
- engagement of people;
- process approach;
- improvement;
- evidence-based decision making;
- relationship management.

This is a preview of "ISO/TS 22163:2017". Click here to purchase the full version from the ANSI store.

0.3 Process approach

0.3.1 General

ISO 9001:2015, Quality management systems — Requirements

0.3 Process approach

0.3.1 General

This International Standard promotes the adoption of a process approach when developing, implementing and improving the effectiveness of a quality management system, to enhance customer satisfaction by meeting customer requirements. Specific requirements considered essential to the adoption of a process approach are included in [4.4](#).

Understanding and managing interrelated processes as a system contributes to the organization's effectiveness and efficiency in achieving its intended results. This approach enables the organization to control the interrelationships and interdependencies among the processes of the system, so that the overall performance of the organization can be enhanced.

The process approach involves the systematic definition and management of processes, and their interactions, so as to achieve the intended results in accordance with the quality policy and strategic direction of the organization. Management of the processes and the system as a whole can be achieved using the PDCA cycle (see 0.3.2) with an overall focus on risk-based thinking (see 0.3.3) aimed at taking advantage of opportunities and preventing undesirable results.

The application of the process approach in a quality management system enables:

- a) understanding and consistency in meeting requirements;
- b) the consideration of processes in terms of added value;
- c) the achievement of effective process performance;
- d) improvement of processes based on evaluation of data and information.

Figure 1 gives a schematic representation of any process and shows the interaction of its elements. The monitoring and measuring check points, which are necessary for control, are specific to each process and will vary depending on the related risks.

This is a preview of "ISO/TS 22163:2017". [Click here to purchase the full version from the ANSI store.](#)

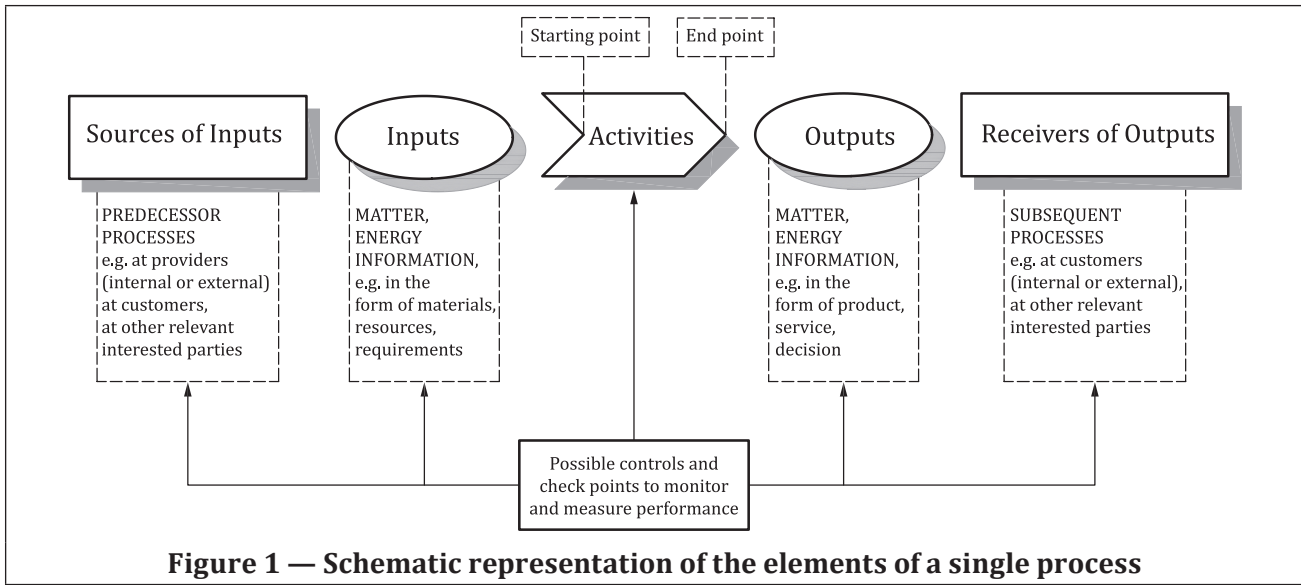


Figure 1 — Schematic representation of the elements of a single process

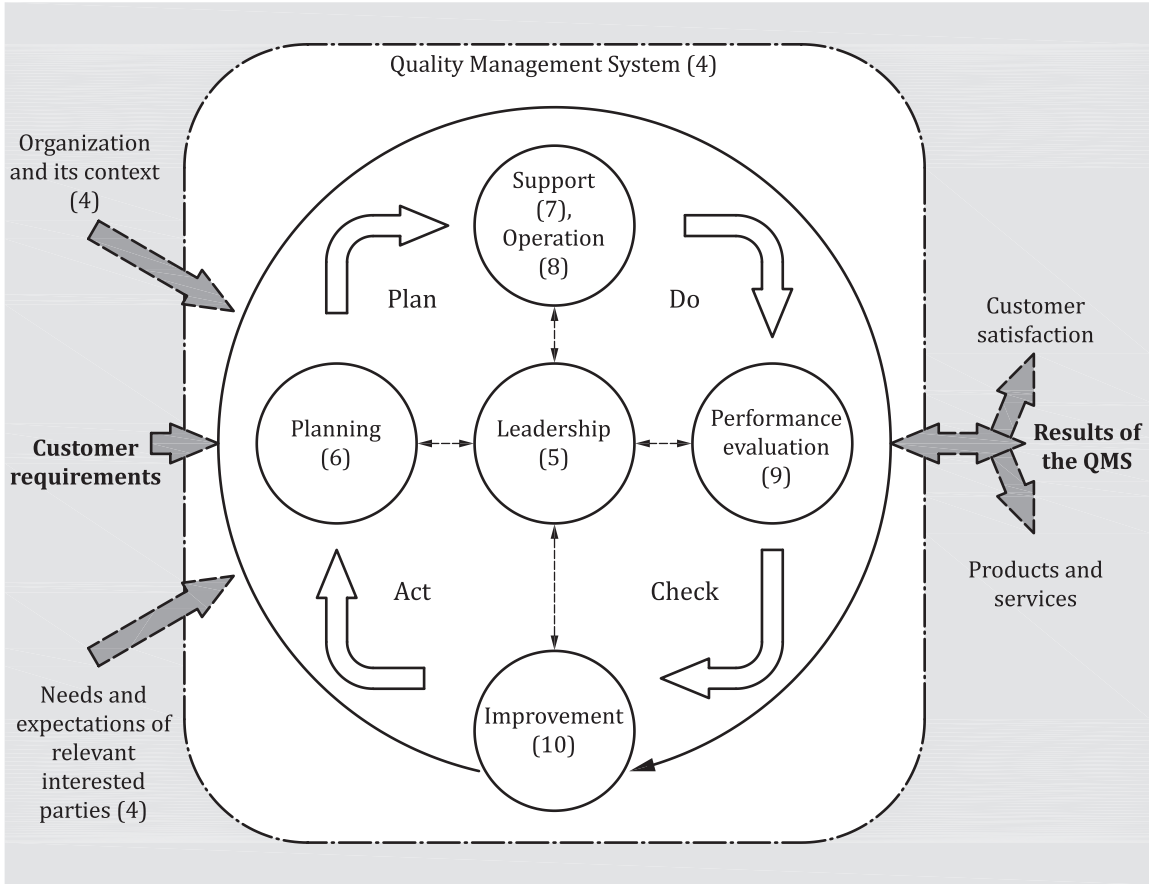
This is a preview of "ISO/TS 22163:2017". Click here to purchase the full version from the ANSI store.

0.3.2 Plan-Do-Check-Act cycle

ISO 9001:2015, Quality management systems — Requirements

0.3.2 Plan-Do-Check-Act cycle

The PDCA cycle can be applied to all processes and to the quality management system as a whole. Figure 2 illustrates how Clauses 4 to 10 can be grouped in relation to the PDCA cycle.



NOTE Numbers in brackets refer to the clauses in this International Standard.

Figure 2 — Representation of the structure of this International Standard in the PDCA cycle

The PDCA cycle can be briefly described as follows:

- **Plan:** establish the objectives of the system and its processes, and the resources needed to deliver results in accordance with customers' requirements and the organization's policies, and identify and address risks and opportunities;
- **Do:** implement what was planned;
- **Check:** monitor and (where applicable) measure processes and the resulting products and services against policies, objectives, requirements and planned activities, and report the results;
- **Act:** take actions to improve performance, as necessary.

0.3.3 Risk-based thinking

ISO 9001:2015, Quality management systems — Requirements

0.3.3 Risk-based thinking

Risk-based thinking (see Clause A.4) is essential for achieving an effective quality management system. The concept of risk-based thinking has been implicit in previous editions of this International Standard including, for example, carrying out preventive action to eliminate potential nonconformities, analysing any nonconformities that do occur, and taking action to prevent recurrence that is appropriate for the effects of the nonconformity.

To conform to the requirements of this International Standard, an organization needs to plan and implement actions to address risks and opportunities. Addressing both risks and opportunities establishes a basis for increasing the effectiveness of the quality management system, achieving improved results and preventing negative effects.

Opportunities can arise as a result of a situation favourable to achieving an intended result, for example, a set of circumstances that allow the organization to attract customers, develop new products and services, reduce waste or improve productivity. Actions to address opportunities can also include consideration of associated risks. Risk is the effect of uncertainty and any such uncertainty can have positive or negative effects. A positive deviation arising from a risk can provide an opportunity, but not all positive effects of risk result in opportunities.

This is a preview of "ISO/TS 22163:2017". Click here to purchase the full version from the ANSI store.

0.4 Relationship with other management system standards

ISO 9001:2015, Quality management systems — Requirements

0.4 Relationship with other management system standards

This International Standard applies the framework developed by ISO to improve alignment among its International Standards for management systems (see Clause A.1).

This International Standard enables an organization to use the process approach, coupled with the PDCA cycle and risk-based thinking, to align or integrate its quality management system with the requirements of other management system standards.

This International Standard relates to ISO 9000 and ISO 9004 as follows:

- ISO 9000 *Quality management systems — Fundamentals and vocabulary* provides essential background for the proper understanding and implementation of this International Standard;
- ISO 9004 *Managing for the sustained success of an organization — A quality management approach* provides guidance for organizations that choose to progress beyond the requirements of this International Standard.

Annex B provides details of other International Standards on quality management and quality management systems that have been developed by ISO/TC 176.

This International Standard does not include requirements specific to other management systems, such as those for environmental management, occupational health and safety management, or financial management.

Sector-specific quality management system standards based on the requirements of this International Standard have been developed for a number of sectors. Some of these standards specify additional quality management system requirements, while others are limited to providing guidance to the application of this International Standard within the particular sector.

A matrix showing the correlation between the clauses of this edition of this International Standard and the previous edition (ISO 9001:2008) can be found on the ISO/TC 176/SC 2 open access web site at: www.iso.org/tc176/sc02/public.