

HB90.3—2000



The Construction Industry

Guide to ISO 9001:2000

S t a n d a r d s A u s t r a l i a



***The
Construction
Industry
Guide
to
ISO 9001:2000***

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Published by Standards Australia International Ltd
GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 3702 1

PREFACE

This Handbook provides guidance on the application of ISO 9001:2000, *Quality management systems—Requirements*, for organizations in the construction industry.

ISO 9001:2000 is referred to as ‘the standard’ in the text. ‘Construction’ refers to engineering or building works of any description, from concept to realization.

ISO 9001:2000 is the third edition of the standard. It is a technical revision and replaces the 1994 editions of ISO 9001, ISO 9002 and ISO 9003. The revised title no longer includes the term ‘quality assurance’, which reflects the fact that the quality management system requirements specified in the current edition, in addition to quality assurance of product, also aim to enhance customer satisfaction.

The text of ISO 9001:2000 is included in shaded boxes, clause-by-clause, followed by relevant guidance. The guidance is not intended to add to or diminish the requirements of ISO 9001, and does not contain normative requirements.

The main objectives of this Handbook are to interpret and explain the requirements of ISO 9001:2000 in terms relevant to and readily understood by organizations in the construction industry, and to help them to develop a ‘common language’ and understanding of quality management systems and their intended applications.

The introductory sections focus on the crucial role of top management before going on to explain some key points regarding the new concepts, structure, changes and terms in the new edition of ISO 9001.

The clause-by-clause guidance focuses on quality management systems as they apply to the processes of a construction industry organization, i.e. within the enterprise/project, and at the interfaces with suppliers and customers.

Appendix A discusses the roles and responsibilities on a project from a ‘functional’ rather than an organizational perspective. The critical roles played by the Project Principal and the various management functions are explained.

The Handbook, including the further guidance in Appendix A, brings out the importance of recognizing the project nature of work in the construction industry and the need for applying (quality) management on a project as well as an individual organization basis.

The glossary provides further explanation of some of the terms used.

Acknowledgements

This Handbook was prepared as a replacement for AS/NZS 3905.2:1997 by —

Steven Wong (Convenor)	Construction QA Services Pty Ltd
John Anderson	Kilpatrick Green Pty Ltd
Cliff Bromiley	Boulderstone Hornibrook Pty Ltd
Mike Cush	Department of Public Works and Services of NSW
Mike Evans	Assurance Management Services Pty Ltd
Alex Ezrakhovich	Quality Assurance Services Pty Ltd

It was circulated for review to members of the construction industry and further revised in response to the input received.

The contribution of all these parties is gratefully acknowledged.

CONTENTS

FOREWORD	5
A message from the Minister	5
A message for top management	6
Major changes	8
INTRODUCTION.....	10
0.1 General	10
0.2 Process approach	10
0.3 Relationship with ISO 9004.....	13
0.4 Compatibility with other management systems	14
1 SCOPE.....	15
1.1 General	15
1.2 Application	15
2 NORMATIVE REFERENCE.....	17
3 TERMS AND DEFINITIONS.....	17
4 QUALITY MANAGEMENT SYSTEM	18
4.1 General requirements.....	18
4.2 Documentation requirements.....	20
5 MANAGEMENT RESPONSIBILITY.....	28
5.1 Management commitment	28
5.2 Customer focus	29
5.3 Quality policy	30
5.4 Planning.....	31
5.5 Responsibility, authority and communication	34
5.6 Management review	38
6 RESOURCE MANAGEMENT	41
6.1 Provision of resources	41
6.2 Human resources.....	43
6.3 Infrastructure	46
6.4 Work environment.....	47
7 PRODUCT REALIZATION.....	48
7.1 Planning of product realization	48
7.2 Customer-related processes	50
7.3 Design and development	53
7.4 Purchasing.....	64
7.5 Production and service provision	69
7.6 Control of monitoring and measuring devices	75
8 MEASUREMENT, ANALYSIS AND IMPROVEMENT.....	78
8.1 General	78
8.2 Monitoring and measurement.....	81
8.3 Control of nonconforming product	91
8.4 Analysis of data	93
8.5 Improvement	94

APPENDIX A FURTHER GUIDANCE ON APPLYING ISO 9001:2000 TO
CONSTRUCTION PROJECTS 98

GLOSSARY..... 109

FOREWORD

A message from the Minister



Construction is becoming an increasingly global business. Competition in the industry is intensifying, and projects are becoming larger and more complex. Clients are becoming more demanding, and increasingly they are looking for complete packages of construction services.

In this environment, the relationships between suppliers, project managers and customers are the key to success. Customers will need to be confident that firms can get the job done. Firms will need to develop plans, and communicate and effectively fulfil these plans, in order to successfully complete projects.

The Construction Industry—Guide to ISO 9001:2000 will support firms in meeting these challenges. It sets out requirements for quality management systems which enable suppliers and project leaders to demonstrate their capability to design, supply for, and construct, projects. However, the *Guide* is not prescriptive—it encourages firms to develop a quality management system to suit the way their organization does business.

The *Guide* is written in plain, easy-to-understand English, especially for the construction industry, and aims to explain the requirements of the standard. ISO 9001:2000 itself represents an improved, streamlined, approach to quality management standards which incorporates a number of previous standards into one, more accessible standard.

I would like to congratulate all those who worked on this *Guide*, and warmly commend it for your use.

A handwritten signature in black ink, which appears to read "Nick Minchin". The signature is fluid and cursive.

Senator the Hon Nick Minchin

Minister for Industry, Science and Resources

December 2000

A message for top management

This Handbook is important to you, as an executive in the construction industry.

Quality systems are all about achieving efficient, profitable operations through consistent predictable delivery of products and services. This guide appropriately interprets the generic ISO 9001:2000 quality system requirements for our industry.

A quality management system is an expression of *how top management wants the organization to deliver its products and services*. No quality management system can realize its potential without top management commitment, involvement and direction.

Recognizing the essential role that top management plays, ISO 9001:2000 places much clearer emphasis on the involvement of ‘top management’ than was the case with the earlier versions of the Standard. A major section (and arguably the most important section) of the Standard is devoted to management responsibility.

The 2000 version of ISO 9001 has introduced a number of significant changes. It will require your appreciation, involvement and direction to ensure they are introduced into your organization in an effective manner. These changes include new requirements for monitoring customer satisfaction and for building formal continual improvement processes into your quality management system. For example, clause 5.2 now explicitly requires top management to ensure customer requirements *‘are determined and are met with the aim of enhancing customer satisfaction’*.

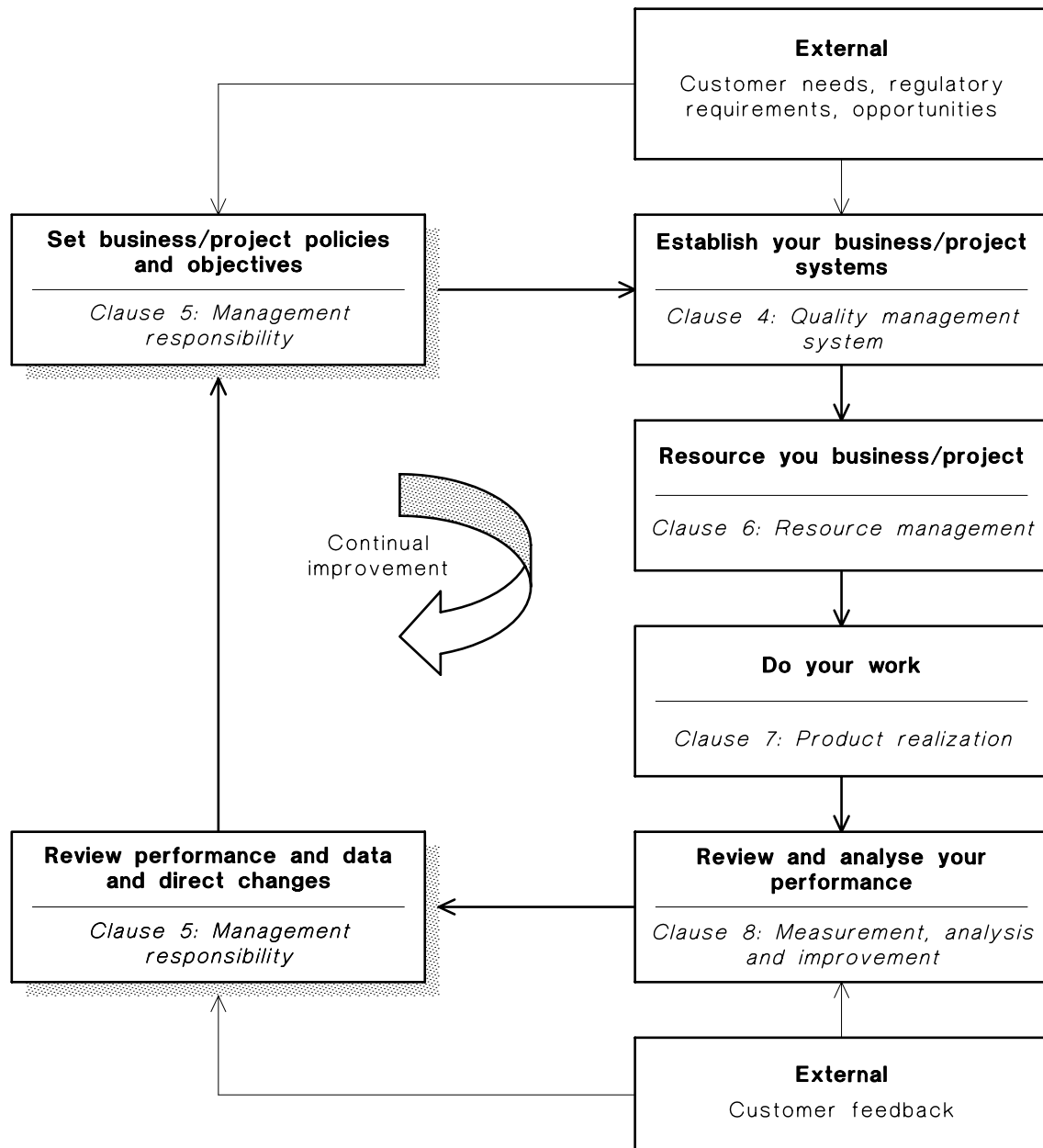
The emphasis on customer requirements also broadens the scope of application of the standard to include all issues of concern to the customer. Whereas in the past your quality system may have been focussed on product quality, in many instances it will now have to address issues such as safety, environment, community relations, industrial relations etc.

Many organizations will find it easier to delete the word ‘quality’ and develop a management system that covers all aspects of their operation.

The project nature of the industry provides special challenges and demands special skills. Interfaces are many and varied, and our ability to deliver quality to a satisfied customer frequently depends not only on our performance, but on the performance of our customer, our suppliers and often the performance of organizations with whom we have no contractual arrangement. The Handbook recognizes this, both in the clause-by-clause guidance and in Appendix A, which discusses the roles of the various management functions on a project and the importance of effective interfacing.

An effective quality management system can seldom be developed immediately from seed. However, it is inevitable that if you apply the principles within ISO 9001 you will, through measurement and analysis coupled with top management review and direction, identify incremental improvements that will produce a highly effective quality management system of great benefit to your organization.

The main sections of the Standard can be summarized in the following chart:



**CHART: A 'SNAPSHOT' OF ISO 9001:2000—
BUSINESS PROCESSES TO ACHIEVE PRODUCT QUALITY
AND SATISFIED CUSTOMERS**

Major changes

The major changes between the 1994 and 2000 versions of ISO 9001 are set out below.

Process approach

A process model approach has been used to develop the 2000 version of ISO 9001. As a result the old '20 clause' structure of the 1994 version has gone and the structure of the standard is now more closely aligned to business working practices.

While at first glance, it would appear that the 2000 version has been completely rewritten, what has actually happened is that most of the content of the 1994 version has been redistributed into the new process model structure. In doing so, the text may have been changed but in many cases the intent of the clause has not. However, it is true that new requirements have been added and the major ones are discussed briefly here and in more detail in the clause-by-clause guidance (e.g. see clause 0.2).

One beneficial outcome of this approach is that the weighting given to the content via a main clause and subclause structure is more appropriate to business needs. In the old 20 clause approach the clause numbering gave undue weight to some aspects of relatively minor importance. Issues such as management responsibility and resourcing are given much greater prominence in the 2000 version. The standard has been restructured to look at your management system and business processes from your side (i.e. the way you do business), rather than from the perspective of your customers' requirements for quality assurance.

Top management responsibility

The role of top management in directing the establishment and implementation of an organization's quality management system has been significantly strengthened. New obligations include establishment of measurable objectives throughout relevant functions and levels of the organization.

Identification of customer requirements

The standard now requires an organization to identify and respond to requirements not necessarily stated by the customer but necessary for specified and intended use (including statutory/regulatory requirements such as those pertaining to safety and the environment).

One standard

ISO 9001:2000 is now the only requirements standard. ISO 9002 and ISO 9003 have been made obsolescent on publication of ISO 9001:2000.

Provision has been made to consider certain requirements for exclusion if they cannot be applied due to the nature of the organization and its product (see clause 1.2 *Application*).

Customer satisfaction

One of the most significant changes is that the 2000 version requires an organization to have a customer focus and to monitor customer satisfaction as one of the means to be used in evaluating the performance and effectiveness of the quality management system.

Continual improvement

Another significant change is that organizations are now required to have a process of continual improvement built into their quality management system.

Interaction between processes

The standard requires you to identify and describe the processes of your organization, their sequence, and how they interact.

Internal communication

The standard requires you to have an internal communication process to provide information on the quality management system and its effectiveness.

Competency

In assessing human resources and training needs, the issue of competency has been introduced into the 2000 version of the Standard

Requirement for documented procedures

The standard now specifically requires you to document how you address the requirements of six particular clauses (and uses the term ‘documented procedures’, see clause 4.2.1).

Your organization is also required to determine what other documentation is needed for it to control its operations and processes, and to decide how it is to be maintained and used, and what it is to be called. You now have more choice in *what* you document and *how* you do it.

New terminology

The standard now uses the terms ‘**supplier → organization → customer**’ to identify your organization’s place in the supply chain, which is in line with business practice.

This replaces the ‘subcontractor ↔ supplier ↔ customer’ terminology of the 1994 edition, and the standard no longer used the term ‘subcontractor’.

‘**Product realization**’ is the term used for any **processes** that deliver services and get the work done (see clauses 0.2 and 7).

These and other terms used are explained in more detail in clause 3 and the Glossary.

STANDARD**Introduction****0.1 General**

The adoption of a quality management system should be a strategic decision of an organization. The design and implementation of an organization's quality management system is influenced by varying needs, particular objectives, the products provided, the processes employed and the size and structure of the organization. It is not the intent of this International Standard to imply uniformity in the structure of quality management systems or uniformity of documentation.

The quality management system requirements specified in this International Standard are complementary to requirements for products. Information marked "NOTE" is for guidance in understanding or clarifying the associated requirement.

This International Standard can be used by internal and external parties, including certification bodies, to assess the organization's ability to meet customer, regulatory and the organization's own requirements.

The quality management principles stated in ISO 9000 and ISO 9004 have been taken into consideration during the development of this International Standard.

GUIDANCE

This clause is a general introduction to the standard, and emphasizes that it is not intended as a prescriptive approach to developing quality management systems.

(See clauses 0.3 and 2 for references to ISO 9004 and ISO 9000 respectively. Both contain a list of eight 'quality management principles' that top management can use in leading an organization towards improved performance, explained under the headings *Customer focus*, *Leadership*, *Involvement of people*, *Process approach*, *System approach to management*, *Continual improvement*, *Factual approach to decision making* and *Mutually beneficial supplier relationships*.)

STANDARD**0.2 Process approach**

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.

For an organization to function effectively, it has to identify and manage numerous linked activities. An activity using resources, and managed in order to enable the transformation of inputs into outputs, can be considered as a process. Often the output from one process directly forms the input to the next.

The application of a system of processes within an organization, together with the identification and interactions of these processes, and their management, can be referred to as the "process approach".

An advantage of the process approach is the ongoing control that it provides over the linkage between the individual processes within the system of processes, as well as over their combination and interaction.

When used within a quality management system, such an approach emphasizes the importance of

- a) understanding and meeting requirements,
- b) the need to consider processes in terms of added value,

- c) obtaining results of process performance and effectiveness, and
- d) continual improvement of processes based on objective measurement.

The model of a process-based quality management system shown in Figure 1 illustrates the process linkages presented in clauses 4 to 8. This illustration shows that customers play a significant role in defining requirements as inputs. Monitoring of customer satisfaction requires the evaluation of information relating to customer perception as to whether the organization has met the customer requirements. The model shown in Figure 1 covers all the requirements of this International Standard, but does not show processes at a detailed level.

NOTE In addition, the methodology known as “Plan-Do-Check-Act” (PDCA) can be applied to all processes. PDCA can be briefly described as follows.

Plan: establish the objectives and processes necessary to deliver results in accordance with customer requirements and the organization’s policies.

Do: implement the processes.

Check: monitor and measure processes and product against policies, objectives and requirements for the product and report the results.

Act: take actions to continually improve process performance.

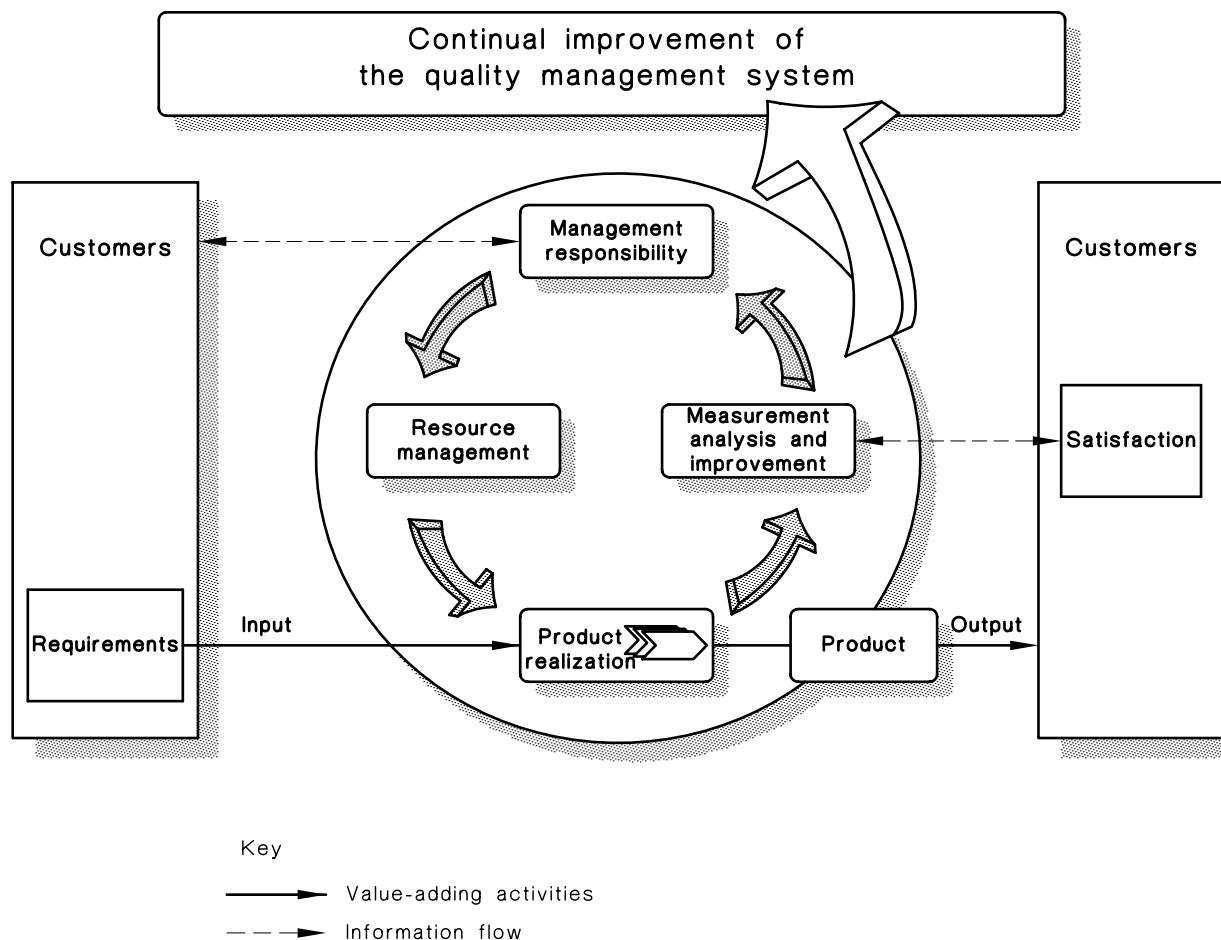


Figure 1 — Model of a process-based quality management system

GUIDANCE The activities represented by the boxes on Figure 1 correspond to the main requirements clauses and headings (clauses 5 to 8) of the standard.

Clause 4 can be seen as an overview or ‘executive summary’ of what is required to implement a quality management system. (See also ‘A Message for Top Management’.)

The *process* approach is based on the concept that —

- any work gets done by a *process*, i.e a system of activities that turns inputs and resources into outputs; and therefore
- any product (including services and projects) is the result of a process, or *series of related processes*, that can be identified, planned, controlled and improved.

It is important that you take the time to think through this ‘process approach’, as the requirements of the rest of the standard are written around this underlying concept (e.g. see clause 4.1).

This provides a tool for breaking down big tasks or projects into a series of inputs, processes and sub-processes. These can then be monitored and measured, and then passed on as outputs to the next stage. If the work performed by the organization involves a number of processes and sub-processes, the process model can be applied iteratively, by means of:

- Identifying inputs (from the output of the previous stage).
- Planning.
- Monitoring.
- Improving.

This systematic approach can achieve results if you use it as your basis for analysis, planning, resource allocation and controls within your quality management system, and for understanding and improving your processes.

Where construction projects involve a large number of stages and processes, the same principle can be applied by considering each project stage or element as a series of interrelated processes.

These stages can be further broken down, if necessary, to each sub-process. For example, construction roadworks may involve sub-processes for earthworks, pavement, lighting, drainage, landscaping, road marking, and so forth. (And earthworks may contain excavation, spoil removal, grading, etc.)

In all cases, what is important is for each organization in the ‘supply chain’ to identify its suppliers and customers, and to identify, understand and control its inputs, responsibilities, processes, and outputs (see also the guidance for clause 4.1 and Appendix A).

STANDARD**0.3 Relationship with ISO 9004**

The present editions of ISO 9001 and ISO 9004 have been developed as a consistent pair of quality management system standards which have been designed to complement each other, but can also be used independently. Although the two International Standards have different scopes, they have similar structures in order to assist their application as a consistent pair.

ISO 9001 specifies requirements for a quality management system that can be used for internal application by organizations, or for certification, or for contractual purposes. It focuses on the effectiveness of the quality management system in meeting customer requirements.

ISO 9004 gives guidance on a wider range of objectives of a quality management system than does ISO 9001, particularly for the continual improvement of an organization's overall performance and efficiency, as well as its effectiveness. ISO 9004 is recommended as a guide for organizations whose top management wishes to move beyond the requirements of ISO 9001, in pursuit of continual improvement of performance. However, it is not intended for certification or for contractual purposes.

GUIDANCE**ISO 9004 AND THE ORGANIZATION'S 'STAKEHOLDERS'**

ISO 9004:2000, *Quality management systems—Guidelines for performance improvements*, provides guidelines beyond the requirements given in ISO 9001, and considers both the effectiveness and efficiency of an organization's quality management system. The focus of ISO 9004 is on achieving ongoing improvement.

The difference between the objectives of ISO 9001 and the 'wider range of objectives' covered by ISO 9004 can be summed up in the difference between the 'process model' diagrams in the two standards. ISO 9001 looks at *customer* requirements and satisfaction, and ISO 9004 looks further to all the *stakeholders*, i.e. to the overall performance of the organization.

In addition to customers, 'stakeholders' draws in shareholders in the business, employees, regulators and other authorities, neighbourhood and community interests, and so forth. The terms 'stakeholder' and 'interested party' are commonly used interchangeably and in a very sweeping way to refer to the broad range of individuals and groups that may be affected by an organization's activities.

STANDARD**0.4 Compatibility with other management systems**

This International Standard has been aligned with ISO 14001:1996 in order to enhance the compatibility of the two standards for the benefit of the user community.

This International Standard does not include requirements specific to other management systems, such as those particular to environmental management, occupational health and safety management, financial management or risk management. However, this International Standard enables an organization to align or integrate its own quality management system with related management system requirements. It is possible for an organization to adapt its existing management system(s) in order to establish a quality management system that complies with the requirements of this International Standard.

GUIDANCE**ENVIRONMENTAL MANAGEMENT AND OCCUPATIONAL HEALTH AND SAFETY**

These standards recognize that organizations have a broad range of responsibilities, and these may include environmental responsibilities and the health and safety of employees and the public.

A broad common approach can allow more flexibility for integrating quality, environmental and safety aspects into management systems, and may suit many organizations in the construction industry.

Care has been taken to ensure that ISO 9001 is compatible with ISO 14001, the International Standard for environmental management systems (EMS)*.

* Organizations in Australia and New Zealand also have available AS 4801 and NZS 4801, *Occupational health and safety management systems—Specification with guidance for use*, which they can use as a basis for their occupational health and safety (OHS) management systems.

Further guidance on management system integration is provided in AS/NZS 4581, *Management system integration—Guidance to business, government and community organizations*, and in HB 139, *Step by step guidance on integrating management systems—Health and safety, environment, quality*, and should be helpful for construction organizations.

For more information, or to download these publications, visit the Standards Australia web site: www.standards.com.au

STANDARD**1 Scope****1.1 General**

This International Standard specifies requirements for a quality management system where an organization

- a) needs to demonstrate its ability to consistently provide product that meets customer and applicable regulatory requirements, and
- b) aims to enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer and applicable regulatory requirements.

NOTE In this International Standard, the term “product” applies only to the product intended for, or required by, a customer.

GUIDANCE

This general clause explains the scope of ISO 9001 and the reasons you may chose to apply it to your business.

STANDARD**1.2 Application**

All requirements of this International Standard are generic and are intended to be applicable to all organizations, regardless of type, size and product provided.

Where any requirement(s) of this International Standard cannot be applied due to the nature of an organization and its product, this can be considered for exclusion.

Where exclusions are made, claims of conformity to this International Standard are not acceptable unless these exclusions are limited to requirements within clause 7, and such exclusions do not affect the organization’s ability, or responsibility, to provide product that meets customer and applicable regulatory requirements.

GUIDANCE**WHAT IF REQUIREMENTS IN ‘PROCESS REALIZATION’ DON’T APPLY?**

This clause introduces the concept that some requirements of clause 7, *Product realization*, may not be relevant to your processes or products, and therefore may be excluded from the scope of your quality management system.

This possibility of ‘exclusions’ applies only within clause 7. Clauses 4, 5, 6 and 8 are mandatory requirements.

If any requirements in clause 7 are not applicable to your processes, and you exclude them, this must be stated clearly in your quality manual, together with the reasons they do not apply (see clause 4.2.2). Exclusions can apply to only those requirements that do not affect either your organization’s processes or its ability to provide products (including services) that satisfy the purpose intended.



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