INTERNATIONAL STANDARD

ISO 13879

First edition
1999-10-15

Petroleum and natural gas industries — Content and drafting of a functional specification

Industries du pétrole et du gaz naturel — Rédaction et contenu d'une spécification fonctionnelle

Reference number
ISO 13879:1999(E)

Contents

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Printed in Switzerland

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 13879 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum and natural gas industries.*

Annex A of this International Standard is for information only.

Introduction

When a user/purchaser wishes to procure a product, process or service, the user/purchaser may produce a functional specification. If so, the manufacturer/supplier provides a technical specification (see ISO 13880) as the basis for manufacturing or execution. The user/purchaser decides on the extent to which it is necessary to determine, directly or indirectly, that relevant requirements are fulfilled and states this in the contract with the manufacturer/supplier. A functional specification may not be necessary if a user/purchaser wishes to obtain a known standard product, process or service manufactured/supplied to a recognized standard.

Petroleum and natural gas industries — Content and drafting of a functional specification

1 Scope

This International Standard provides guidance on the content and drafting of a functional specification.

A functional specification may not be necessary if a user/purchaser wishes to obtain a known standard product, process or service manufactured/supplied to a recognized standard.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. For this dated reference, subsequent amendments to, or revisions of, this publication do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 13880:—[1)] , *Petroleum and natural gas industries — Drafting and content of a technical specification*.

3 Terms and definitions

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

3.1
functional specification
document that describes the features, characteristics, process conditions, boundaries and exclusions defining the performance and use requirements of the product, process or service

3.2
technical specification
document that prescribes technical requirements to be fulfilled by the product, process or service in order to comply with the functional specification

NOTE A technical specification should indicate, whenever appropriate, the procedure(s) by means of which it might be determined whether the requirements given are fulfilled.

1) To be published.

4 Guidelines for drafting

4.1 Objective of a functional specification

The objective of a functional specification is to define verifiable provisions in order to ensure the user/purchaser obtains the product, process or service with the required performance. In order to achieve this, the functional specification should:

— be as complete as necessary within the limits specified by the scope;

— be consistent and accurate;

— take into account the state of the art;

— be comprehensible to qualified persons who have not participated in its preparation;

— take into account operational, safety and maintenance aspects related to the total life cycle.

NOTE There are some cases in which performance requirements may lead to complicated testing procedures of long duration. In these cases, specifying by description may be necessary. See 5.2 of ISO/IEC Directives Part 2, 1992.

4.2 Format of a functional specification

The functional specification should only contain requirements that can be verified. Uniformity of structure, style and terminology should be maintained within each functional specification, and within any series of associated functional specifications. The same terminology should be used throughout, and synonyms should be avoided.

The text of the functional specification should follow the relevant guidelines of existing basic International Standards. See 4.3 of ISO/IEC Directives Part 3, 1997. This relates particularly to:

— standardized terminology;

— principles and methods of terminology;

— quantities, units and their symbols;

— abbreviated terms;

— bibliographic references;

— technical drawings and/or service procedures;

— graphical symbols.

In addition, for technical aspects, the relevant provisions of general International, regional and national standards dealing with the following subjects should be considered:

— environmental conditions and associated tests;

— type tests or service procedure trials;

— safety;

— regulatory requirements;

— statistical methods.

5 Framework, structure and content

5.1 General arrangement

The following elements should be present in a functional specification:

— preliminary elements identifying the functional specification;

— normative elements specifying the requirements for compliance with the functional specification;

— supplementary elements that provide additional information to assist the understanding of the functional specification.

The suggested arrangement is indicated in Table 1.

Table 1 – Arrangement of elements

Type of element		Element	Subclause of this International Standard (ISO 13879)
Preliminary		Title page Contents Foreword Introduction	5.2.1, 5.3.1 5.2.2 5.2.3 5.2.4
Normative	General	Title Scope Normative References	5.3.1 5.3.2 5.3.3
	Functional	Terms and definitions Symbols and abbreviated terms Operating environment Functional requirements Boundaries, limits and exclusions Ergonomics Safety and environment Special functional requirements Documentation Normative annexes	5.4.1 5.4.2 5.4.3 5.4.4 5.4.5 5.4.6 5.4.7 5.4.8 5.4.9 5.4.10
Supplementary		Informative annexes Operational experience	5.5.1 5.5.2

5.2 Preliminary elements

5.2.1 Title page

The title page should contain the title (see 5.3.1), an identification of the initiating organization, a unique identifier, issue date and authorization.

5.2.2 Contents

The contents should comprise a list of the clauses and the annexes. All the elements should be given with their full titles.

5.2.3 Foreword

This is an optional element and may contain the following:

— an indication of the organization which prepared the functional specification;

— information regarding the approval level of the functional specification;

— a statement that the functional specification cancels or replaces other documents in whole or in part;

— a statement or an indication of significant changes from any previously supplied specifications;

— a statement clarifying which annexes are normative and which are informative.

5.2.4 Introduction

This is an optional preliminary element used to give specific information or commentary about the contents of the functional specification. It shall not contain requirements.

5.3 General normative elements

5.3.1 Title

The wording of the title should be as concise as possible and should indicate the subject matter of the functional specification, without going into unnecessary detail.

The title should be composed of separate elements, each as short as possible, proceeding from the general to the particular. Not more than the following three elements should be used:

a) an introductory element indicating the general field to which the functional specification belongs;

b) a main element indicating the principal subject treated within that general field;

c) a complementary element indicating the particular aspect of the principal subject or giving details which distinguish the document from any other functional specifications or other parts of the same functional specification.

5.3.2 Scope

This element should define the subject matter of the aspect(s) covered and indicate any limits of applicability.

5.3.3 Normative references

This optional element shall give a list of the normative documents to which reference is made in the standard in such a way as to make them indispensable for the application of the standard. For dated references, each shall be given with its year of publication, or in the case of enquiry or final drafts, with a dash together with a footnote “To be published” and full title. The year of publication or dash shall not be given for undated references. When an undated reference is to all parts of a standard, the publication number shall be followed by the indication “(all parts)” and the general title of the series of parts (i.e. the introductory and main elements).

The list should not include the following:

— documents that are not available to the manufacturer/supplier;

— documents to which only informative reference is made;

— documents which have merely served as references in the preparation of the functional specification.

5.4 Functional normative elements

5.4.1 Terms and definitions

This is an optional element giving definitions necessary for the understanding of certain terms used in the functional specification. The definitions should be introduced by the following wording:

"For the purpose of this functional specification, the following definitions apply".

5.4.2 Symbols and abbreviated terms

This is an optional element giving a list of symbols and abbreviated terms necessary for the understanding of the functional specification.

5.4.3 Operating environment

This element should provide all information known to the specifier about the environment in which the product, process or service operates.

5.4.4 Functional requirements

This element should define the required performance of the product, process or service.

These requirements should include:

— all characteristics and parameters relevant to the performance of the product, process or service covered by the functional specification, either explicitly or by reference;

— the required limiting values of quantifiable characteristics;

— the description of the process in or for which the product, process or service is used;

— handling, storage and transportation;

— critical parameters and/or aspects, if any;

— any preservative requirement(s);

— the product, process or service acceptance criteria.

A clear distinction should be made between requirements (normative) and statements included only for information or guidance (informative).

Contractual requirements concerning claims, covering of expenses, etc. should not be included.

NOTE Where necessary, descriptive requirements may be specified (see 4.1).

5.4.5 Boundaries, limits and exclusions

This element should impose limits with which the product, process or service should comply.

Boundaries and limits may include specific requirements which cannot be stated as a general requirement applicable to the scope of the functional specification.

5.4.6 Ergonomics

This element should define the ergonomic requirements relevant to the product, process or service and should contain the elements stated in ISO 6385.

5.4.7 Safety and environment

This element should define the safety and environmental requirements relating to the product, process or service in order to eliminate or minimize the identified hazards.

The safety aspects in the functional specification should be specified in accordance with ISO/IEC Guide 51.

5.4.8 Special functional requirements

This element should be included if the functional requirements deviate from the general requirements stated in 5.4.4. It should therefore state under which circumstances these deviations are applicable.

5.4.9 Documentation

This element should define the documentation to be provided, such as:

— records/certificates and other supporting evidence of conformity with the functional specification;

— documents related to the commissioning, operation, maintenance and decommissioning of the product, process or service, if appropriate.

For development, or pilot test or service procedure trials, a programme together with quantifiable and/or measurable parameters should be provided.

5.4.10 Normative annexes

Normative annexes are integral parts of the functional specification. Their presence is optional. An annex's normative status (as opposed to informative) shall be made clear by the way in which it is referred to in the text, by a statement to this effect in the foreword and by an indication in the table of contents and under the heading of an annex.

5.5 Supplementary elements

5.5.1 Informative annexes

Informative annexes give additional information and should not contain any requirements.

5.5.2 Operational experience

This optional element provides operational and/or technical data regarding one or more technical or operational aspects or characteristics for which the user/purchaser has evidence of performance. These data enable the manufacturer/supplier to learn from the past history and experience of the user/purchaser with aspects and characteristics of the product, process or service or part(s) thereof. Furthermore it provides the manufacturer/supplier with the compliance aspects in case of alternative products, process or service or part(s) thereof for which evidence shall be provided that the alternative is equal or better.

Annex A
(informative)

Frequently asked questions

A.1 Who writes a functional specification?

A functional specification is written by a user/purchaser.

A.2 When to write a functional specification?

A functional specification may be written at the discretion of the user/purchaser. Some examples of when a functional specification may be useful are as follows:

— When a user/purchaser knows his performance requirements but has no preconceived ideas as to how they will be met;

— Where there is innovative engineering for which no standard components are available;

— When standard components are engineered into a package, where the components may be supplied to recognized standards. In this case, the Functional Specification may include references to component standards in order to indicate the expectations of the user/purchaser;

— When a user/purchaser wishes to widen his choice of standard products, processes or services;

— When the available standards do not specify the performance requirements.

A.3 How to write a functional specification?

A functional specification should be written using a team approach. The team should consist of a user of the relevant product, process or service assisted by experts for specific topics. The team should be aware of what is available in the market, and should consider life cycle costing.

A.4 Where does the functional specification apply and where not?

A functional specification applies where trade is involved and where the requirements need to be defined to enable fitness for purpose assessment (ISO/IEC Directives Part 2, 5.1.1). This applies to products, processes and services.

A functional specification does not apply when requirements cannot be verified by a known test method or other defined means of verification, demonstrating that the product, process or service will conform to the stated requirements and/or rules. For example, a functional specification does not apply to legal requirements.

A functional specification may not be necessary if a user/purchaser wishes to obtain a known standard product, process or service (e.g. a commodity product) to a recognized standard.