



# Quality for oil and gas sector

## New, improved edition of ISO/TS 29001

*A second edition has just been published of ISO/TS 29001, the quality management requirements documents developed to meet the specific needs of the oil and gas sector. As well as describing what's new about the document, this feature looks at the roll-out of ISO/TS 29001 in the industry and the state of certification to the document, as well as related accreditation.*

by **Ken Peurifoy** and  
**Lanny Gookin**



*Ken Peurifoy served as Project Leader of the ISO/TC 67 Project Task Group that developed ISO/TS 29001:2003 and was Chairman of the American Petroleum Institute's C4/SC18 Task Group that developed the API version of ISO/TS 29001, 'API Specification Q1 7<sup>th</sup> Edition'. A former Chair of API's Committee on Quality for eight years, he is also a member of the US Technical Advisory Group to ISO/TC 176.*

*A registered Lead Quality Management System Auditor, Mr. Peurifoy has been a quality professional for over 30 years. He is Vice President and Senior Consultant of Quality Support International, Inc. in Spring, Texas, that provides quality consulting and support primarily to the oil and natural gas industry.*

E-mail [ckpeurif@flash.net](mailto:ckpeurif@flash.net)



*Lanny Gookin is the ranking consultant member of API Subcommittee 18, the Subcommittee on Quality that controls API Spec Q1. A registered Lead Quality Management System Auditor and ASQ Certified Quality Engineer, he has authored numerous articles and given presentations on quality in the oil and gas industry over the past 25 years.*

*Mr. Gookin is President and Senior Consultant of QMR Consulting, Inc. in Houston, Texas, a quality consulting, training, and auditing organization that has established QMS for oilfield users, engineering companies, manufacturers, and suppliers throughout the world.*

E-mail [lanny@qmrc.com](mailto:lanny@qmrc.com)

Web [www.qmrc.com](http://www.qmrc.com)



The second edition of the ISO technical specification ISO/TS 29001:2007, the sector-specific quality management system (QMS) specification for the petroleum, petrochemical and natural gas industries, was published on 1 December 2007, incorporating improvements developed by ISO technical committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum and natural gas industries*.

This article provides an overview of the need for sector-specific requirements for the industry, a history of ISO/TS 29001, its sector-specific requirements including the

new, second edition requirements, and its utilization within the international petroleum, petrochemical and natural gas industries.

### Sector specific

Certain industries or sectors must have a more specific and rigorous QMS than the requirements established in the generic ISO 9001:2000 QMS standard and have therefore developed industry-specific QMS specifications and standards. Their reasons include reduction of risk, inclusion of industry specific needs, compliance with statu-

tory and regulatory requirements, and increased confidence in supplier products and processes.

To assist in the development of the sector-specific documents, ISO technical committee ISO/TC 176, which is responsible for the ISO 9000 family of quality management standards, developed guidance for industry sectors in ISO/TC 176 N858, *Guidance And Criteria For The Development Of Documents To Meet the Needs Of Specific Product And Industry/Economic Sectors*.

Each sector-specific QMS document adds requirements

to the ISO 9001:2000 base requirements by one of two methods (no requirements of ISO 9001 may be diminished). The additional requirements may be integrated within ISO 9001:2000 with the sector-specific text in italics, (e.g., ISO 13485:2003 for the medical device sector), or the ISO 9001:2000 text is placed in boxes and the sector-specific requirements are added below the applicable section in regular font, (e.g., ISO/TS 29001 and ISO/TS 16949 for the automotive sector).

**Certain industries or sectors must have a more specific and rigorous QMS than the generic ISO 9001:2000**

ISO/TS 29001 is one of some 14 sector-specific QMS technical specifications and standards based on ISO 9001:2000 with added requirements.

A technical specification, ISO/TS 29001:2007 utilizes the method that incorporates the verbatim text of ISO 9001:2000 in boxes and adds detailed, sector-specific requirements below the applicable 9001 section box.

Although some of the supplementary requirements may be viewed as not specific to the oil and gas industry, they are needed in ISO/TS 29001 in order to ensure that the requirement(s) are explicit and can be more readily verified/audited.



## SPECIAL REPORT

### Cooperation between ISO/TC 67 and API

The first edition of ISO/TS 29001 was the result of collaboration between the American Petroleum Institute (API) and ISO technical committee ISO/TC 67.

In addition to providing the Secretariat of ISO/TC 67, API has a long history of cooperation and support for ISO/TC 67. The relationship goes back to the reactivation of ISO/TC 67 in 1989. Shortly thereafter, ISO/TC 67 “fast tracked” a number of API standards that were then adopted as ISO International Standards.

When it came time for the API (Quality) Subcommittee 18 to revise API Specification Q1, *Specification for Quality Programs for the Petroleum,*

*Petrochemical and Natural Gas Industry*, developing a joint API-ISO version of the longstanding QMS standard was a major priority.

The API Quality Subcommittee concluded that the best way to increase international acceptance would be to draft the next version of API Spec Q1 (7<sup>th</sup> Edition) with a joint API/ISO committee with the final result being a joint publication of API Spec Q1 and ISO/TS 29001. The ultimate goal was to obtain worldwide acceptance and use of the document.

**ISO/TS 29001 is the result of collaboration between the American Petroleum Institute and ISO/TC 67**

### Initial development of ISO/TS 29001

After publication of ISO 9001:2000, the API Quality Committee determined that many of the requirements that were deleted from the ISO 9001:1994 version were still desirable for the oil and gas industry. Particularly desirable were the requirements for some documented procedures for quality elements that were relinquished by ISO 9001:2000.

The initiative to develop ISO/TS 29001 began within API during the API Subcommittee 18 and Committee 4 on Quality’s January 2002 Winter Meetings in Tampa, Florida. The final intent of was to publish the joint or adopted-back API/ISO standard. API submitted a New

Work Item (NWI) to ISO TC 67 in April, which was accepted on 16 June 2002.

### Liaison with ISO TC 176

Early on, ISO/TC 67 requested and received liaison with ISO/TC 176. Mr. Jim Pyle (of the London Quality Centre) was appointed as the ISO/TC 176 liaison member to the ISO/TC 67 Work Group 2 ISO/TS 29001 Project Team. He attended several meetings both in the US and Europe.

Having been a key participant within ISO/TC 176 and the development of ISO 9001:2000, Mr. Pyle was extremely helpful in providing valuable insight and suggestions on how the Work Group should approach various issues and supplementary requirements that are the trademark of the document.

### Identical documents

The first edition of ISO/TS 29001 was published on 15 September 2003 and the API version, API Specification Q1, Seventh Edition was published on 15 June 2003. The documents are identical except for an annex in Q1 relating to API administration.

ISO/TS 29001:2007, second edition, was published on 1 December 2007 and re-adopted by the API as the eighth edition of API Spec Q1 in December 2007. Again, both documents are identical with the exception of the annex in API Spec Q1 relating to administration of the API Monogram programme for the qualification of products and services used in the petroleum industry.



These documents add to the continuing list of ISO/API standards that are developed by joint working groups and committees and are published by both ISO and API to serve the oil and gas industry.

## Supplementary Requirements

### Control features

After ISO 9001:2000 reduced the number of documented procedures required to six (compared to the requirements in ISO 9001:1994), the requirements to document the “lost” documented procedures were included in ISO/TS 29001 as “control features”.

ISO/TS 29001 defines a “control feature” as an “organization’s documented method to perform an activity under controlled conditions to achieve conformity to specified requirements.” This definition is central to a number of supplementary requirements of ISO/TS 29001.

For many industries, the reduction in the number of procedures required to specify process requirements was a welcome relief. However, in the oil and gas industry, the need for procedures or documented methods to perform processes under controlled conditions is considered necessary.

A documented method to perform processes assists personnel in performing process tasks consistently to ensure the activities are performed in conformity with specified requirements.

## Project leader sums up importance of TS 29001

**Ed Durante**, project leader of the ISO/TC 67 working group WG 2 that developed ISO/TS 29001:2007, summed up its importance as follows:



“ISO/TS 29001:2007 is the next step in the evolution of this important sector-specific document. Over the past two years, numerous suggestions were received from various sectors of the petroleum, petrochemical and natural gas sectors.

“These suggestions were evaluated by a dedicated group of experts representing all stakeholders, including end users, manufacturers and service providers. The result of this

effort has resulted in a document that addresses the unique needs of the industry and is poised to gain international acceptance as the quality management system for

the industry.”

Mr. Durante’s experience includes 25 years on the API Sub-Committee on Quality (SC-18), and Chairman of API work Group on Q1 8<sup>th</sup> edition. He is President of TIEC, INC. a technical and quality consulting firm.

E-mail [EDurante@tiec.com](mailto:EDurante@tiec.com)

Web [www.tiec.com](http://www.tiec.com)

Supplementary requirements within ISO/TS 29001:2007 that require control features include

- competence, awareness and training;
- planning of product realization – product requirements provided from external sources;
- review of requirements related to product;
- design and development planning;
- purchasing process and supplier selection;
- verification of purchased product;
- control of production and service provision;
- identification and traceability;
- customer property;
- preservation of the product;
- control of monitoring and measuring devices;
- monitoring and measurement of the product;
- analysis of data.

## Independent reviews/acceptance

### Design reviews

The ISO/TS 29001:2007 clause *Design and development review – Supplemental* requires ... “A final design review shall be conducted and documented. Individual(s) other than the person or persons who developed the design shall approve the final design.”

### Acceptance inspection

Initially published as *Final acceptance of product* in the 2003 version, ISO/TS 29001:2007, *Acceptance inspection – supplemental* (ISO 9001:2000 clause 8.2.4.2 under 8.2.4 *Monitoring and measurement of product*), requires ... “Personnel other than those who performed or directly supervised the production of the product shall perform final acceptance inspection at planned stages of the product realization process.”

### Internal audits

ISO/TS 29001:2007 *Internal Audit – Supplemental*, to further enhance the objectivity and impartiality of the internal audit process, requires ... “Internal audits shall be scheduled and conducted at least annually by personnel independent of those who performed or directly supervised the activity being audited.”

**In the oil and gas industry, the need for procedures or documented methods is considered necessary**

## SPECIAL REPORT

### Field nonconformity analysis

#### *Field nonconformity analysis*

ISO/TS 29001:2007 addresses nonconforming product detected after delivery or use has started as “field nonconformities” and requires the organization’s procedure for managing nonconforming product to include and ensure the analysis of field nonconformities.

A vital aspect of quality management systems for the oil and gas industry is the requirement for organizations to track and analyze field failures/field nonconformities. Although in some cases field failures cannot be retrieved for analysis, field failures can often provide invaluable information which an organization can use to develop and implement effective corrective and preventive actions.

### Defined frequencies

#### *Management reviews*

ISO 9001:2000 requires management review of the QMS at “planned intervals”. However, it does not specify a required frequency. To ensure that management reviews are performed at planned intervals that are not too infrequent, ISO/TS 29001 requires, “The management review shall be conducted at least annually.”

#### *Internal audits*

ISO 9001:2000 requires organizations to “conduct internal audits at planned intervals.” To ensure organizations do not perform internal

audits too infrequently, ISO/TS 29001:2007 requires that “internal audits shall be scheduled and conducted at least annually.” In addition, ISO/TS 29001:2007 requires, “The organization shall identify response times for addressing detected nonconformities.”

### ISO/TS 29001:2007 – what’s new?

As required by ISO Directives, ISO technical specifications must be reviewed and reaffirmed every three years. ISO/TC 67 Work Group 2 and API Subcommittee 18 (Quality) began the review and reaffirmation process in January 2006. The determination was made by ISO/TC 67 that ISO/TS 29001 would be reaffirmed and remain a technical specification with “minor” revisions.

Some of the minor changes to ISO/TS 29001:2007 include:

- adding the word “supplemental” to supplemental section headings that did not initially include this description;
- adding two new definitions – “acceptance inspection” to clarify the 8.2.4.2 change of *Final acceptance of product* to *Acceptance inspection – Supplemental*, and a definition of “field nonconformity” to support clause 8.3.2, *Field nonconformity analysis – Supplemental*;
- a new clause 4.1.1 *Outsourced processes and/or services – Supplemental* was added which requires “The organization shall maintain responsibility for product

conformance to specified requirements when processes are outsourced”;

- a new clause 7.3.3.1 *Design and development outputs – Supplemental* was added which requires “Design and development outputs shall be documented”;
- a revision to clause 7.5.2.1 *Validation of processes for production and service provision – Supplemental*, which specifies which processes must be validated when not addressed by an ISO/TC 67/API Product Specification;
- a new clause 8.3.4 *Customer Notification – Supplemental*, has been added which requires organizations to “notify customers in the event that product which does not conform to design acceptance criteria has been delivered.” The clause also requires the organization to “maintain records of such notifications.”;

### Industry acceptance

Little by little, the oil and gas industry is utilizing the document by requiring suppliers/contractors to meet its requirements and in some cases, to maintain a QMS certified to ISO/TS 29001/API Specification Q1. ExxonMobil and British Petroleum have included requirements in many of their procurement specifications for suppliers/contractors and service contractors to demonstrate compliance to ISO 9001:2000 and also meet the additional requirements of ISO/TS 29001. Other oil companies have also

required many of their suppliers to meet the requirements of ISO/TS 29001/API Specification Q1.

In addition, the demand for training on ISO/TS 29001 and the revised version of the specification appears to be growing as both suppliers and registrars are requesting that training classes be conducted.

### Certification

The primary registrar providing ISO/TS 29001 QMS certification appears to be APIQR. According to Gerardo Uria, API - Manager of Certification Programs, “APIQR has certified 269 organizations to ISO/TS 29001 as of December 2007 and another 146 organizations have currently applied for ISO/TS 29001 certification and are in the application process.”

There are a number of other registrars whose Web sites indicate that they offer ISO/TS 29001 assessments and certification.

Although accreditation of competence to perform ISO/TS 29001 certification has not been offered by accreditation bodies to date, that may change. Many accreditation bodies have not offered ISO/TS 29001 accreditation to date primarily because of the relatively small number of organizations requesting ISO/TS 29001 certification.

However, as more purchasers specify the ISO/TS 29001 QMS requirements and certification, more suppliers can be expected to ask for an accredited certification.



## Conclusions

The petroleum, petrochemical and natural gas industries are by their very natures risky and dangerous with a potential for damage to the environment and risk to human health and safety.

With today's technical challenges of deeper wells, higher pressures, deeper subsea completions, greater transportation challenges, and larger refining capacities worldwide, the industry will face increasing challenges in its efforts to pro-

cure safe and reliable products and services.

The need for a more rigorous sector-specific QMS that will provide additional assurance in the processes of product and service suppliers is self-evident.

Purchasers must continue to require suppliers/contractors to develop and implement effective quality management systems that ensure that processes are in place to reduce the risks to the operators and the general pub-

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lic of inadequate products or services.

The industry must also continue to seek third party assistance in assessing supplier quality management systems to international QMS requirement documents, especially ISO/TS 29001.

The enhancements to the basic ISO 9001:2000 as indicated above to the supplementary requirements are necessary and beneficial to all members of the industry. The requirements to perform independent design reviews and to have final acceptance inspection, in particular, should be reasonable alone to specify ISO/TS 20001 rather than ISO 9001:2000 for petroleum, petrochemical and natural gas industries. •