

ISO/TS 29001 set to become oil and gas industry's unique QMS standard



Photo Hydro

A successful partnership between ISO and the international oil and gas industry has resulted in the publication of a new technical specification for implementing ISO 9001:2000-based quality management systems in the sector.

ISO/TS 29001:2003, *Petroleum, petrochemical and natural gas industries – Sector-specific quality management systems – Requirements for product and service supply organizations*, is envisaged to become the common and unique basis for the oil and gas industry's quality management system requirements worldwide.

ISO/TS 29001¹⁾ is available for use by manufacturers of oil and gas industry equipment and materials (upstream and downstream), service providers to the oil and gas industry, purchasers of equipment, materials, and services. The document can also

be used for organizations to perform auditing and certification. This single worldwide system will replace the need for multiple systems, audits and certifications.

Why industry specific?

Why does the oil and gas industry need an industry-specific quality management system? The current worldwide standard for quality management systems, ISO 9001:2000, is a generic one that must satisfy the needs of many types of industry and organization. It reflects feedback on

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1) ISO/TS 29001:2003, *Petroleum, petrochemical and natural gas industries – Sector-specific quality management systems – Requirements for product and service supply organizations*, costs 108 Swiss francs and is available from ISO national member institutes (see the complete list with contact details on ISO's Web site: www.iso.org) and ISO Central Secretariat: sales@iso.org.

the previous ISO 9000 versions that the requirements were not flexible enough and did not allow for adaptation for software companies, manufacturers of simple consumer products, and services such as insurance and banking.

In contrast, due to the critical needs of the international oil and gas industry, this sector requires rigorous conformity to engineering, user and regulatory requirements. The industry handles fluids (liquids and gases), often at high pressures, through a variety of products and processes. Considerations for the safety of personnel, including the public, are of paramount importance. Additionally, protection of the environment and of business continuity (maintenance of revenue streams, both for companies and for national economies) require a high level of operational integrity.



A key element in the assurance of product and service safety and business continuity is the quality management system implemented by goods suppliers and service contractors. Industries in which the results of catastrophic failure are intolerable have traditionally embraced and required quality management system standards that are more prescriptive.

Supplementary requirements

A technical specification, ISO/TS 29001 incorporates the verbatim text of ISO 9001:2000 and includes detailed, sector-specific requirements for design, development, production, installation and service of products. To assist users of the document, the requirements of ISO 9001:2000 are given in boxed text, followed by specific guidance and supplementary requirements for its implementation within the industry. 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 requirements are

more explicit and can be more readily verified/audited.

The supplementary requirements of ISO/TS 29001 make the document undeniably more prescriptive. These supplementary requirements help to ensure that additional preventive actions are taken by the organizations manufacturing goods and/or performing services for use in the oil and gas industry, which are often subjected to very harsh and demanding environments.

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Objectivity, impartiality and independence

ISO 9001:2000 requires the “objectivity and impartiality of the audit process”. ISO/TS 29001 also requires the same objectivity plus “independence” with regard to both design reviews and final acceptance of product. These requirements are key to ensuring additional safeguards for purchased products and services.

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- **Design reviews.** ISO/TS 29001, “Design and development review – Supplementary”, 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.”
- **Final acceptance.** ISO/TS 29001, “Final acceptance of product”, requires...“Personnel other than the persons who performed or directly supervised the production of the materials or products shall perform final acceptance and product release.”
- **Internal audits.** To further enhance the objectivity and impartiality of the internal audit process, ISO/TS 29001:2003 goes even further than ISO 9001:2000 to require that internal auditors are “personnel independent of those who performed or directly supervised the activity being audited”.

By requiring that “independent” persons perform these tasks, ISO/TS 29001 goes a step further to ensure the objectivity and impartiality of the end results of the processes.

Field nonconformity analysis

ISO/TS 29001 addresses nonconforming product that is detected after delivery or use has started as “field nonconformities” and requires the organization’s procedure for managing nonconforming product to include field nonconformities. A vital, key 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 instances, 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.



Photo: Hydro

Frequency of management activities

ISO 9001:2000 requires management reviews and internal audits to be performed at planned intervals. ISO/TS 29001 requires specific minimum frequencies for these management activities. By requiring specific frequencies of certain process and that specific response times are identified, ISO/TS 29001 helps to ensure these processes are performed in a timely manner.

- **Management review.** To ensure that management reviews are performed at planned intervals that are not too infrequent, ISO/TS

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Co-author

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29001:2003 requires, "The management review shall be conducted at least annually."

- **Internal audits.** ISO 9001:2000 requires that organizations "conduct internal audits at planned intervals" to determine whether the quality management system conforms to requirements and is effectively implemented and maintained. ISO/TS 29001 requires that "internal audits shall be scheduled and conducted at least annually". In addition, ISO/TS 29001 requires, "Response times for submission of an action plan to address detected nonconformities shall be identified."

Control features

While ISO 9001:2000 has reduced the number of documented procedures required to six, additional documented requirements have been required in ISO/TS 29001 as control features. ISO/TS 29001 defines "control features" as an "organization's documented method to perform an activity under controlled conditions to achieve conformity to specified requirements". This definition is key to a number of the 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.

Documenting the best way to perform a process, as well as documenting the required acceptance criteria for the process, will be key to many industries, particularly with the upcoming

changes to the age demographics of the work force in the industry. Within the next few years, many workers in the oil and gas industry will be reaching retirement age and younger workers will need to rely on documented methods to perform processes and convey lessons learned.

The changing average age and loss of experienced workers in the oil and gas industry has prompted many organizations in the sector to actively pursue knowledge management (KM) technologies and ensure that valuable experience is documented and retained for future employees. Documented control features help ensure that KM is preserved for those organizations that utilize

ISO/TS 29001 as the basis for their quality management system.

ISO/TS 29001 requires specific minimum frequencies for management reviews and internal audits

Cooperation between ISO/TC 67 and the API

The new document was the result of collaboration between the American Petroleum Institute (API) and ISO technical committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*.

In addition to being 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 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.

According to John Modine, Director of Certification Programs for the American Petroleum Institute (API),

ISO/TS 29001 is expected to result in “increased international acceptance of time-tested, sector-specific quality system requirements on a broad scale for the worldwide oil and gas industry”. He defines it as: “One industry – one standard.”

He adds: “The API Quality Committee knew that API Spec Q1 (6th Edition) contained extremely valuable quality system requirements to the international oil and gas industry. The committee concluded that the best way to increase international acceptance would be to draft the next version of API Spec Q1 (7th 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 is to obtain worldwide acceptance and use of the standard.”

Liaison with ISO/TC 176

Early on, ISO/TC 67 requested and received liaison with ISO/TC 176 (the ISO committee responsible for ISO 9001:2000). Mr. Jim Pyle (London Quality Centre) was appointed as the ISO/TC 176 liaison member to Work Group 2 and he attended several meetings of the group both in the US and in 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.

Development of ISO/TS 29001

After the 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 during the API Subcommittee 18 and Committee 4 on Quality’s January 2002 winter meetings in Tampa, Florida. The final intent was to publish the seventh edition of Q1 as a joint API/ISO standard. API submitted a New Work Item (NWI) to ISO/TC 67 in April and it was accepted on 16 June 2002.

Identical documents

ISO/TS 29001:2003 was published on 15 September 2003 and the API version, API Specification Q1, seventh Edition was published on 15 June 2003, becoming effective and mandatory on 15 December 2003. The documents are identical except for one additional requirement in the API document relating to API administration.

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

Conclusion

Due to the critical nature of products, services and processes within the petroleum, petrochemical and natural gas industry, additional requirements were needed for quality management systems of goods suppliers and service contractors within the sector. The development of ISO/TS 29001 has fulfilled that need and has brought a more comprehensive quality management system to this critical industry.

In order to best serve the interests of the industry, and as a method of better ensuring the safety of personnel and the environment, engineers, purchasers, users, manufacturers, service organizations and suppliers should adopt this standard as the basis for oil and gas industry quality management systems. ■

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