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Specification for Quality Programs for the Petroleum and Natural Gas Industry

API SPECIFICATION Q1
SIXTH EDITION, MARCH 1, 1999
EFFECTIVE DATE: SEPTEMBER 1, 1999

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Upstream Segment

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Specification for Quality Programs for the Petroleum and Natural Gas Industry

Part One: Quality System Requirements

0 Introduction

API Specification Q1 provides requirements for a quality system that may be applied on an international basis to facilitate the consistent and reliable manufacture of products to specifications prepared for the oil and gas industry. Part One of this Standard is aligned with ANSI/ISO/ASQC Q9001-1994, Quality Systems—Model for Quality Assurance in Design, Development, Production, Installation and Servicing. Content of API Spec Q1 not found in ANSI Q9001-1994 is shown in italics.

When used by API licensees in conjunction with the requirements of the API License Agreement, Part Two of this specification is required (normative).

Notes in this standard are for information and do not contain requirements.

1 Scope

This international standard specifies quality system requirements for use where a supplier's capability to design and supply conforming product needs to be demonstrated.

The requirements specified are aimed primarily at achieving customer satisfaction by preventing nonconformity at all stages from design through servicing.

This standard does not address competitive or commercial matters such as price, warranties, guarantees, or clauses intended to sustain commercial objectives.

This international standard is applicable in situations when:

a. Design is required and the product requirements are stated principally in performance terms, or they need to be established.

b. Confidence in product conformance can be attained by adequate demonstration of a supplier's capabilities in design, development, production, installation and servicing.

c. *Conformance to quality system requirements is essential to consistently produce products in accordance with specified requirements.*

2 Normative Reference

The following standard contains provisions which, through reference in this text, constitute provisions of this international standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this international standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. The American National Standards Institute and members of IEC and ISO maintain registers of currently valid American National Standards and International Standards.

ISO

8402:1994 *Quality management and quality assurance—Vocabulary*

3 Definitions

For the purposes of this international standard, the definitions given in ISO 8402 apply, except for the following definitions.

3.1 *Acceptance Criteria:* *Defined limits placed on characteristics of materials, products, and services.*

3.2 *Calibration:* *Comparison and adjustment to a standard of known accuracy.*

3.3 Contract: Agreed requirements between a supplier and customer transmitted by any means.

3.4 *Control Feature:* *A documented method to perform an activity to ensure conformance with specified requirements.*

3.5 *Delivery:* *That point in time and physical location at which the agreed transfer of ownership takes place.*

3.6 *Design Acceptance Criteria:* *Defined limits placed on characteristics of materials, products, or services established by the supplier to ensure conformance to the product design.*

3.7 *Design Validation:* *The process of proving a design by testing. The required testing is that required by the supplier, user, and/or the applicable product specification to demonstrate the conformance of the product to design requirements.*

3.8 *Design Verification:* *The process of examining the result of a given design or development activity to determine conformance with specified requirements.*

3.9 *Dispatch:* *To send off to a particular destination.*

3.10 *Documentation:* *Recorded information.*

3.11 *Manufacturing Acceptance Criteria:* *Defined limits placed on characteristics of materials, products, and services established by the supplier to ensure conformance to the manufacturing requirements.*

3.12 Product: Result of activities or processes.

Note: 1: A product may include service, hardware, processed materials, software, or a combination thereof.

Note 2: A product can be tangible (e.g., assemblies or processed materials) or intangible (e.g., knowledge or concepts), or a combination thereof.

Note 3: For purposes of this international standard, the term "product" applies to the intended product offering only and not to unintended "by-products" affecting the environment. This differs from the note given in ISO 8402.

3.13 *Quality:* *Conformance to specified requirements.*

3.14 *Special Processes:* *Processes, the results of which cannot be fully verified by subsequent inspection and/or testing of the product.*

3.15 *Specified Requirements:* *Those requirements necessary to provide product, including designated quality system elements, design and manufacturing acceptance criteria and customer defined requirements.*

3.16 Tender: Offer made by a supplier in response to an invitation to satisfy a contract award to provide product.

4 Quality System Requirements

4.1 MANAGEMENT RESPONSIBILITY

4.1.1 Quality Policy

The supplier's management with executive responsibility shall define, document and *approve* its policy for quality including objectives for quality and its commitment to quality. The quality policy shall be relevant to the supplier's organizational goals and the *requirements* of its customers. The supplier shall ensure that this policy is understood, implemented and maintained at all levels of the organization.

4.1.2 Organization

4.1.2.1 Responsibility and Authority

The responsibility, authority and the interrelation of personnel who manage, perform and verify work affecting quality shall be defined and documented, particularly for personnel who need the organizational freedom and authority to:

a. Initiate action to prevent the occurrence of any nonconformities relating to product, process and quality system.
b. Identify and record any problems related to product, process and quality system.
c. Initiate, recommend or provide solutions through designated channels.
d. Verify the implementation of solutions.
e. Control further processing, delivery or installation of nonconforming product until the deficiency or unsatisfactory condition has been corrected.

4.1.2.2 Resources

The supplier shall identify resource requirements and provide adequate resources, including the assignment of trained personnel (see 4.18) for management, performance of work, and verification activities including internal quality audits.

4.1.2.3 Management Representative

The supplier's management with executive responsibility shall appoint a member of the supplier's own management who, irrespective of other responsibilities, shall have defined authority *and responsibility* for:

a. Ensuring that a quality system is established, implemented and maintained in accordance with this international standard.
b. Reporting on the performance of the quality system to the supplier's management for review and as a basis for improvement of the quality system.

Note 4: The responsibility of a management representative may also include liaison with external parties on matters relating to the supplier's quality system.

4.1.3 Management Review

The supplier's management with executive responsibility shall review the quality system *annually* to ensure its continuing suitability and effectiveness in satisfying the requirements of this international standard and the supplier's stated quality policy and objectives (see 4.1.1). *The management review shall include, but not be limited to, the results of internal audits, trends of nonconformances, corrective/preventive actions and changes to applicable oil and gas industry standards.* Records of such reviews shall be maintained (see 4.16).

4.2 QUALITY SYSTEM

4.2.1 General

The supplier shall establish, document and maintain a quality system as a means of ensuring that product conforms to specified requirements. The supplier shall prepare a quality manual covering the requirements of this international standard. The quality manual shall include or make reference to the quality system procedures and outline the structure of the documentation used in the quality system.

Note 5: Guidance on quality manuals is given in ISO 10013.

4.2.2 Quality System Procedures

The supplier shall:

a. Prepare documented procedures consistent with the requirements of this international standard and the supplier's stated quality policy.
b. Effectively implement the quality system and its documented procedures.

For the purpose of this international standard, the range and detail of the procedures that form part of the quality system depend on the complexity of the work, the methods used, and the skills and training needed by personnel involved in carrying out the activity.

Note 6: Documented procedures may make reference to work instructions that define how an activity is performed.

4.2.3 Quality Planning

The supplier shall define and document how the requirements for quality will be met. Quality planning shall be consistent with all other requirements of a supplier's quality system and shall be documented in a format to suit the supplier's method of operation. The supplier shall *provide for the following activities* in meeting the specified requirements for products, projects or contracts:

a. The preparation of quality plans.

b. The identification and acquisition of any controls, processes, equipment (including inspection and test equipment), fixtures, resources and skills that may be needed to achieve the required quality.

c. Ensuring the compatibility of the design, the production process, installation, servicing, inspection and test procedures and the applicable documentation.

d. The updating, as necessary, of quality control, inspection and testing techniques, including the development of new instrumentation.

e. The identification of any measurement requirement involving capability that exceeds the known state of the art in sufficient time for the needed capability to be developed.

f. The identification of suitable verification at appropriate stages in the realization of the product.

g. The clarification of standards of acceptability for all features and requirements, including those which contain a subjective element.

h. The identification and preparation of quality records (see 4.16).

Note 7: The quality plans referred to (see 4.2.3a) may be in the form of a reference to the appropriate documented procedures that form an integral part of the supplier's quality system.

4.3 CONTRACT REVIEW

4.3.1 General

The supplier shall establish and maintain documented procedures for contract review and for the coordination of these activities.

4.3.2 Review

Before submission of a tender, or at the acceptance of a contract or order (statement of requirement), the tender, contract or order shall be reviewed by the supplier to ensure that:

a. The requirements are adequately defined and documented. Where no written statement of requirement is available for an order received by verbal means, the supplier shall ensure that the order requirements are agreed before their acceptance.

b. Any differences between the contract or accepted order requirements and those in the tender are resolved.

c. The supplier has the capability to meet the contract or accepted order requirements.

4.3.3 Amendment to Contract

The supplier shall identify how amendment to a contract is made and correctly transferred to the functions concerned within the supplier's organization.

4.3.4 Records

Records of such contract reviews shall be maintained (see 4.16).

Note 8: Channels for communication and interface with the customer's organization in these contract matters should be established.

4.4 DESIGN CONTROL

4.4.1 General

The supplier shall establish and maintain documented procedures to control and verify the design of the product in order to ensure that the specified requirements are met.

4.4.2 Design and Development Planning

The supplier shall prepare plans for each design and development activity. The plans shall describe or reference these activities, and define responsibility for their implementation. The design and development activities shall be assigned to qualified personnel equipped with adequate resources. The plans shall be updated as the design evolves. *Design documentation shall include the methods, assumptions, formulas, and calculations.*

4.4.3 Organizational and Technical Interfaces

Organizational and technical interfaces between different groups which input to the design process shall be defined and the necessary information documented, transmitted and regularly reviewed.

4.4.4 Design Input

Design input requirements relating to the product, including applicable statutory and regulatory requirements, shall be identified, documented and their selection reviewed by the supplier for adequacy. Incomplete, ambiguous or conflicting requirements shall be resolved with those responsible for imposing these requirements.

Design input shall take into consideration the results of any contract review activities.

4.4.5 Design Output

Design output shall be documented and expressed in terms that can be verified against design input requirements and validated (see 4.4.8).

Design output shall:

a. Meet the design input requirements.
b. Contain or reference acceptance criteria.
c. Identify those characteristics of the design that are crucial to the safe and proper functioning of the product (e.g., operating, storage, handling, maintenance, and disposal requirements).
d. *Be translated into instructions, procedures, specifications, and drawings that include acceptance criteria.*

Design output documents shall be reviewed before release.

4.4.6 Design Review

At appropriate stages of design, formal documented review of the design results shall be planned and conducted. Participants at each design review shall include representatives of all functions concerned with the design stage being reviewed as well as other specialist personnel, as required. Records of such reviews shall be maintained (see 4.16).

Final design review shall be conducted and documented by individuals other than the person or persons who developed the design.

4.4.7 Design Verification

At appropriate stages of design, design verification shall be performed to ensure that the design stage output meets the design input requirements. The design verification measures shall be recorded (see 4.16).

Note 9: In addition to conducting design reviews (see 4.4.6), design verification may include activities such as:
–performing alternative calculations;
–comparing the new design with a similar proven design, if available;
–undertaking tests and demonstrations;
–reviewing the design stage documents before release.

4.4.8 Design Validation

Design validation shall be performed to ensure that product conforms to defined user needs and/or requirements.

Note 10: Design validation follows successful design verification (see 4.4.7).

Note 11: Validation is normally performed under defined operating conditions.

Note 12: Validation is normally performed on the final product, but may be necessary in earlier stages prior to completion.

Note 13: Multiple validations may be performed if there are different intended uses.

4.4.9 Design Changes

All design changes and modifications shall be identified, documented, reviewed and approved by authorized personnel before their implementation. *Design changes and changes to design documents shall require the same control features as the original design and design documentation.*

4.5 DOCUMENT AND DATA CONTROL

4.5.1 General

The supplier shall establish and maintain documented procedures to control all documents and data that relate to the requirements of this international standard including, to the extent applicable, documents of external origin such as standards and customer drawings.

Note 14: Documents and data can be in the form of any type of media, such as hard copy or electronic media.

4.5.2 Document and Data Approval and Issue

The documents and data shall be reviewed and approved for adequacy by authorized personnel prior to issue. A master list or equivalent document control procedure identifying the current revision status of documents shall be established and be readily available to preclude the use of invalid and/or obsolete documents.

This control shall ensure that:

a. The pertinent issues of appropriate documents are available at all locations where operations essential to the effective functioning of the quality system are performed.
b. Invalid and/or obsolete documents are promptly removed from all points of issue or use, or otherwise assured against unintended use.
c. Any obsolete documents retained for legal and/or knowledge preservation purposes are suitably identified.

4.5.3 Document and Data Changes

Changes to documents and data shall be reviewed and approved by the same functions/organizations that performed the original review and approval, unless specifically designated otherwise. The designated functions/organizations shall have access to pertinent background information upon which to base their review and approval.

Document changes shall be identified in the document or the appropriate attachments.

4.6 PURCHASING

4.6.1 General

The supplier shall establish and maintain documented procedures to ensure that the purchased product (see 3.10) conforms to specified requirements.

4.6.2 *Selection and Assessment of Subcontractors*

4.6.2.1 *Selection of Subcontractor*

The supplier shall:

a. *Document the selection criteria and the evaluation of the subcontractor.*
b. Evaluate and select subcontractors on the basis of their ability to meet subcontract requirements including the quality system and any specific quality assurance requirements;
c. Define the type and extent of control exercised by the supplier over subcontractors. This shall be dependent upon the type of product, the impact of subcontracted product on the quality of final product, and, where applicable, on the quality audit reports and/or quality records of the previously demonstrated capability and performance of subcontractors.

4.6.2.2 Assessment of Subcontractor

The supplier shall document the control features used to ensure continuous subcontractor conformance to the supplier's purchasing requirements. These control features shall include one or more of the following:

a. *Inspection of subcontractor's final product by supplier at subcontractors facility.*
b. *Inspection of subcontractor's final product by supplier upon delivery.*
c. *Surveillance of subcontractor's conformance to supplier's purchasing requirements.*
d. *Verification by supplier that subcontractor's quality system conforms to this international standard.*

4.6.2.3 *Subcontractor Records*

The supplier shall establish and maintain quality records of acceptable subcontractors (see 4.16).

4.6.3 Purchasing Data

Purchasing documents shall contain data clearly describing the product ordered, including where applicable:

a. The type, class, style, grade or other precise identification.
b. The title or other positive identification, and applicable issue of specifications, drawings, process requirements, inspection instructions, and other relevant technical data, including requirements for approval or qualification of product, procedure, process equipment and personnel.
c. The title, number and issue of the quality system standard to be applied.

The supplier shall review and approve purchasing documents for adequacy of specified requirements prior to release.

4.6.4 Verification of Purchased Product

4.6.4.1 Supplier Verification at Subcontractors Premises

Where the supplier proposes to verify purchased product at the subcontractor's premises, the supplier shall specify verification arrangements and the method of product release in the purchasing documents.

4.6.4.2 Customer Verification of Subcontracted Product

Where specified in the contract, the supplier's customer or the customer's representative shall be afforded the right to verify at the subcontractor's premises and the supplier's premises that subcontracted product conforms to specified requirements. Such verification shall not be used by the supplier as evidence of effective control of quality by the subcontractor.

Verification by the customer shall not absolve the supplier of the responsibility to provide acceptable product nor shall it preclude subsequent rejection by the customer.

4.7 CONTROL OF CUSTOMER SUPPLIED PRODUCT

The supplier shall establish and maintain documented procedures for the control of verification, storage and maintenance of customer supplied product provided for incorporation into the supplies or for related activities. Any such product that is lost, damaged or is otherwise unsuitable for use shall be recorded and reported to the customer (see 4.16).

Verification by the supplier does not absolve the customer of the responsibility to provide acceptable product.

4.8 PRODUCT IDENTIFICATION AND TRACEABILITY

The supplier *shall* establish and maintain procedures for identifying the product by suitable means from receipt and during all stages of production, delivery, and installation, *as required by the supplier, the customer, and the applicable product specifications.*

Where and to the extent that traceability is a specified requirement, the supplier shall establish and maintain documented procedures for unique identification of individual product or batches. This identification shall be recorded (see 4.16).

The quality system shall include control features for maintenance or replacement of identification marks and identification control records.

4.9 PROCESS CONTROL

4.9.1 General

The supplier shall identify and plan the production, installation, and servicing processes which directly affect quality and shall ensure that these processes are carried out under controlled conditions. Controlled conditions shall include the following:

a. Documented procedures defining the manner of production, installation and servicing, where the absence of such instructions could adversely affect quality.
b. Use of suitable production, installation and servicing equipment, and a suitable working environment.
c. Compliance with reference standards/codes, quality plans, and/or documented procedures.
d. Monitoring and control of suitable process parameters and product characteristics.
e. The approval of processes and equipment, as appropriate.
f. Criteria for workmanship which shall be stipulated in the clearest practicable manner (e.g. written standards, representative samples or illustrations).
g. Suitable maintenance of equipment to ensure continuing process capability.

The requirements for any qualification of process operations, including associated equipment and personnel (see 4.18) shall be specified.

Records shall be maintained for qualified processes, equipment and personnel, as appropriate (see 4.16).

4.9.2 *Process Control Documents*

Process controls shall be documented in routings, travelers, checklists, process sheets, or other types of written or graphic media. These controls shall include requirements for verifying compliance with specified requirements. The process control documents shall include or reference instructions and acceptance criteria for special processes, tests, inspections, and purchaser hold points.

Responsibility for approval of process control documents, processes and equipment shall be specified in the quality system.

4.9.3 *Special Processes*

4.9.3.1 *Special processes shall be identified in the quality system.*

4.9.3.2 *Special processes shall be controlled by qualified control features. Continuous monitoring, if required by the supplier or the applicable product specification, shall be performed in order to ensure compliance.*

4.9.3.3 *The requirements for any qualification of process operations, including associated equipment and personnel (see 4.18) shall be specified.*

4.9.3.4 *Records of the qualification of special processes, equipment, and personnel shall be documented and maintained (see 4.16).*

4.10 INSPECTION AND TESTING

4.10.1 General

The supplier shall establish and maintain documented procedures for the inspection and testing activities in order to verify that the specified requirements for the product are met. The required inspecting and testing, and the records to be established, shall be documented in the quality plan or documented procedures.

4.10.2 Receiving Inspection and Testing

4.10.2.1 The supplier shall ensure that incoming product is not used or processed (except in the circumstances described in 4.10.2.3) until it has been inspected or otherwise verified as conforming to specified requirements. Verification of the specified requirements shall be in accordance with the quality plan and/or documented procedures.

4.10.2.2 In determining the amount and nature of receiving inspection, consideration shall be given to the amount of control exercised at the subcontractor's premises and the recorded evidence of conformance provided.

4.10.2.3 Where incoming product is released for urgent production purposes prior to verification, it shall be positively identified and recorded (see 4.16) in order to permit immediate recall and replacement in the event of nonconformity to specified requirements.

4.10.3 In-Process Inspection and Testing

The supplier shall:

a. Inspect and test the product as required by the quality plan and/or documented procedures.
b. Hold product until the required inspection and tests have been completed or necessary reports have been received and verified except when product is released under positive recall procedures (see 4.10.2.3). Release under positive recall procedures shall not preclude the activities outlined in 4.10.3a.

4.10.4 Final Inspection and Testing

The supplier shall carry out all final inspection and testing in accordance with the quality plan and/or documented procedures to complete the evidence of conformance of the finished product to the specified requirements.

The quality plan and/or documented procedures for final inspection and testing shall require that all specified inspection and tests, including those specified either on receipt of product or in process, have been carried out and that the results meet specified requirements.

Acceptance inspection and testing shall be performed or controlled by personnel other than those who performed or directly supervised the manufacture of the materials or products.

No product shall be dispatched until all the activities specified in the quality plan and/or documented procedures have been satisfactorily completed and the associated data and documentation are available and authorized.

4.10.5 Inspection and Test Records

The supplier shall establish and maintain records which provide evidence that the product has been inspected and/or tested. These records shall show clearly whether the product has passed or failed the inspections and/or tests according to defined acceptance criteria. Where the product fails to pass any inspection and/or test, the procedures for control of nonconforming product shall apply (see 4.13).

Records shall identify the inspection authority responsible for the release of product (see 4.16).

4.11 CONTROL OF INSPECTION, MEASURING AND TEST EQUIPMENT

4.11.1 General

The supplier shall establish and maintain documented procedures to control, calibrate and maintain inspection, measuring, and test equipment (including test software) used by the supplier to demonstrate the conformance of product to the specified requirements. Inspection, measuring, and test equipment shall be used in a manner which ensures that measurement uncertainty is known and is consistent with the required measurement capability.

Where test software or comparative references such as test hardware is used as suitable forms of inspection, they shall be checked to prove that they are capable of verifying the acceptability of product prior to release for use during production, installation or servicing and shall be re-checked at prescribed intervals. The supplier shall establish the extent and frequency of such checks and shall maintain records as evidence of control (see 4.16).

Where the availability of technical data pertaining to the measurement devices is a specified requirement, such data shall be made available, when required by the customer or customer's representative, for verification that the devices are functionally adequate.

Note 15: For the purposes of this international standard, the term "measuring equipment" includes measurement devices.

4.11.2 Control Procedure

The supplier shall:

a. Determine the measurements to be made, the accuracy required and select the appropriate inspection, measuring, and test equipment that is capable of the necessary accuracy and precision.

b. Identify all inspection, measuring, and test equipment that can affect product quality, and calibrate and adjust at prescribed intervals, or prior to use, against certified equipment having a known valid relationship to internationally or nationally recognized standards. Where no such standards exist, the basis used for calibration shall be documented.

c. Define the process employed for the calibration of inspection, measuring and test equipment including details of equipment type, unique identification, location, frequency of checks, check method, acceptance criteria and the action to be taken when results are unsatisfactory.

d. Identify inspection, measuring and test equipment with a suitable indicator or approved identification record to show the calibration status.

e. Maintain calibration records for inspection, measuring, and test equipment (see 4.16).

f. Assess and document the validity of previous inspection and test results when inspection, measuring, and test equipment is found to be out of calibration.

g. Ensure that the environmental conditions are suitable for the calibrations, inspections, measurements, and tests being carried out.

h. Ensure that the handling, preservation and storage of inspection, measuring, and test equipment is such that the accuracy and fitness for use are maintained.

i. Safeguard inspection, measuring, and test facilities, including both test hardware and test software, from adjustments which would invalidate the calibration setting.

Note 16: The metrological confirmation system for measuring equipment given in ISO 10012 may be used for guidance.

4.12 INSPECTION AND TEST STATUS

The inspection and test status of product shall be identified by suitable means, which indicate the conformance or nonconformance of product with regard to inspection and tests performed. The identification of inspection and test status shall be maintained, as defined in the quality plan and/or documented procedures, throughout production, installation and servicing of the product to ensure that only product that has passed the required inspections and tests [or released under an authorized concession (see 4.13.2)] is dispatched, used, or installed.

4.13 CONTROL OF NONCONFORMING PRODUCT

4.13.1 General

The supplier shall establish and maintain documented procedures to ensure that product that does not conform to specified requirements is prevented from unintended use or installation. This control shall provide for identification, documentation, evaluation, segregation (when practical), disposition of nonconforming product and for notification to the functions concerned.

4.13.2 Review and Disposition of Nonconforming Product

4.13.2.1 The responsibility for review and authority for the disposition of nonconforming product shall be defined.

Nonconforming product shall be reviewed in accordance with documented procedures. It may be:

a. *Repaired or* reworked to meet the specified requirements;
b. Accepted with or without repair by concession, or as specified in 4.13.2.2.
c. Regraded for alternative applications, or.
d. Rejected or scrapped.

4.13.2.2 *Control features shall be established for the evaluation and disposition of material and product nonconformities that are accepted. The process of evaluation and disposition of nonconformities shall include one or more of the following:*

a. *Accepting materials or products that do not satisfy manufacturing acceptance criteria provided:*
   1. *Materials or products satisfy the design acceptance criteria, or*
   2. *The violated manufacturing acceptance criteria is categorized as unnecessary to satisfy the design acceptance criteria, or*
   3. *Materials or products are repaired or reworked to satisfy the design acceptance criteria or manufacturing acceptance criteria.*

b. *Accepting materials or products that do not satisfy the original design acceptance criteria provided:*
   1. *The original design acceptance criteria is changed per paragraph 4.4.9, and*
   2. *The materials or products satisfy the new design acceptance criteria.*

4.13.2.3 Where required by the contract, the proposed use or repair of product (see 4.13.2.1.b) which does not conform to specified requirements shall be reported for concession to the customer or customer's representative. The description of nonconformity that has been accepted, and of repairs, shall be recorded to denote the actual condition (see 4.16).

4.13.2.4 Repaired and/or reworked product shall be reinspected in accordance with the quality plan and/or documented procedures.

4.13.3 *Field Nonconformities*

The supplier shall establish control features for identifying, documenting and reporting incidents of field nonconformity of products. These control features shall ensure analysis of nonconforming products, provided the product or documented evidence supporting the nonconformity is available to facilitate determination of the cause.

4.14 CORRECTIVE AND PREVENTIVE ACTION

4.14.1 General

The supplier shall establish, and maintain documented procedures for implementing corrective and preventive action.

Any corrective or preventive action taken to eliminate the causes of actual or potential nonconformities shall be to a degree appropriate to the magnitude of problems and commensurate to the risks encountered.

The supplier shall implement and record any changes in the documented procedures resulting from corrective and preventive action.

4.14.2 Corrective Action

The procedures for corrective action shall include:

a. The effective handling of customer complaints and reports of product nonconformities.
b. Investigation of the cause of nonconformities relating to product and quality system and recording the results of the investigation (see 4.16).
c. Determination of the corrective action needed to eliminate the cause of nonconformities.
d. Application of controls to ensure that corrective action is taken and that it is effective.

4.14.3 Preventive Action

The procedures for preventive action shall include:

a. The use of appropriate sources of information such as processes and work operations which affect product quality, concessions, audit results, quality records, service reports and customer complaints to detect, analyze and eliminate potential causes of nonconformities.
b. Determination of the steps needed to deal with any problems requiring preventive action.
c. Initiation of preventive action and application of controls to ensure that it is effective.
d. Ensuring that relevant information on actions taken is submitted for management review (see 4.1.3).

4.15 HANDLING, STORAGE, PACKAGING, PRESERVATION, AND DELIVERY

4.15.1 General

The supplier shall establish and maintain documented procedures for handling, storage, packaging, preservation and delivery of product.

4.15.2 Handling

The supplier shall provide methods of handling that prevent damage or deterioration.

4.15.3 Storage

The supplier shall use designated storage areas or stock rooms to prevent damage or deterioration of product, pending use or delivery. Appropriate methods for authorizing receipt and the dispatch to and from such areas shall be stipulated.

In order to detect deterioration, the condition of product in stock shall be assessed at *specified* intervals.

4.15.4 Packaging

The supplier shall control packing, packaging and marking processes (including materials used) to the extent necessary to ensure conformance to specified requirements.

4.15.5 Preservation

The supplier shall apply appropriate methods for preservation and segregation of product when the product is under the supplier's control.

4.15.6 Delivery

The supplier shall arrange for the protection of the quality of product after final inspection and test. Where contractually specified, this protection shall be extended to include delivery to destination.

4.16 CONTROL OF QUALITY RECORDS

The supplier shall establish and maintain documented procedures for identification, collection, indexing, access, filing, storage, maintenance and disposition of quality records.

Quality records shall be maintained to demonstrate conformance to specified requirements and the effective operation of the quality system. Pertinent subcontractor quality records shall be an element of these data.

All quality records shall be legible and shall be stored and maintained in such a way that they are readily retrievable in facilities that provide a suitable environment to prevent damage or deterioration and to prevent loss. Retention times of quality records shall be established and recorded. Where agreed contractually, quality records shall be made available for evaluation by the customer or the customer's representative for an agreed period.

Note 17: Records can be in the form of any type media, such as hard copy or electronic media.

4.17 INTERNAL QUALITY AUDITS

The supplier shall establish and maintain documented procedures for planning and implementing internal quality audits to verify whether quality activities and related results comply with planned arrangements and to determine the effectiveness of the quality system.

Internal quality audits shall be scheduled and conducted on all elements of the quality system annually and shall be carried out by personnel independent of those having direct responsibility for the activity being audited.

The results of the audits shall be recorded (see 4.16) and brought to the attention of the personnel having responsibility in the area audited. The management personnel responsible for the area shall take timely corrective action on deficiencies found during the audit. Follow-up audit activities shall verify and record the implementation and effectiveness of the corrective action taken (see 4.16).

Note 18: The results of internal quality audits form an integral part of the input to management review activities (see 4.1.3).

Note 19: Guidance on quality system audits is given in ISO 10011.

4.18 TRAINING, *INDOCTRINATION, AND QUALIFICATION*

4.18.1 The supplier shall establish and maintain control features for identifying the training needs and provide for the training of all personnel performing *activities addressed in 4.1 through 4.20. The training requirements shall provide for quality system indoctrination and job training of personnel. The frequency of training shall be established by the supplier.*

4.18.2 *Personnel who manage, perform, or verify activities addressed in 4.1 through 4.20 shall be qualified to established minimum requirements for that function based on education, training, examination, or experience. Qualification of each of these individuals shall be documented.*

4.18.3 *Records shall be maintained for each individual on indoctrination and training required in the quality system.*

4.19 SERVICING

Where servicing is a specified requirement, the supplier shall establish and maintain documented procedures for performing, verifying, and reporting that the servicing meets the specified requirements.

4.20 STATISTICAL TECHNIQUES

4.20.1 Identification of Need

The supplier shall identify the need for statistical techniques required for establishing, controlling and verifying process capability and product characteristics.

4.20.2 Procedures

The supplier shall establish and maintain documented procedures to implement and control the application of the statistical techniques identified in 4.20.1.

Part Two: The API Monogram Program

0 Introduction

The API Monogram Program allows a licensee to apply the API Monogram to products. Products stamped with the API Monogram provide observable evidence that they were produced in accordance with a verified quality system and in accordance with an API-recognized, international oil and gas industry product specification. The API Monogram Program delivers significant value to the international oil and gas industry by linking the verification of a supplier's quality system with the demonstrated ability to meet specific product specification requirements.

When used in conjunction with the requirements of the API License Agreement, API Specification Q1 Parts One and Two define the program for voluntary licensing of suppliers who wish to provide oil and gas industry products in accordance with an API-recognized international oil and gas industry product specification.

API Monogram Program Licenses are issued only after an on-site audit has verified that the licensee conforms with both the quality system requirements described in Part One and the requirements of an API-recognized international oil and gas industry product specification.

1 Scope

Part Two of this Standard sets forth the API Monogram Program requirements necessary for a supplier to consistently produce products in accordance with API specified requirements. Part Two also includes API and user responsibilities.

2 Normative Reference

2.1 *Standards incorporated by reference in API license agreements constitute provisions of the API Monogram Program.*

3 Definitions

The following definitions constitute provisions of Part Two of API Specification Q1:

3.1 API Specified Requirements: *Those requirements, including performance requirements, set forth in the applicable API product specification or standard and those supplier-specified requirements necessary to meet them.*

3.2 Licensee: *Holder of a license to use the API monogram.*

4 API Monogram Program: Licensee Responsibilities

4.1 *The requirements for all suppliers desiring to acquire and maintain a license to use the API Monogram shall include:*

a. *The quality system requirements of API Specification Q1, Part One.*

b. *The API Monogram Program requirements of API Specification Q1, Part Two.*

c. *The requirements contained in API recognized product specifications.*

d. *The requirements contained in the API License Agreement.*

4.2 *When a licensed supplier is providing monogrammed product, Parts One and Two of API Specification Q1 are mandatory.*

4.3 *Each Licensee shall control the application of the monogram in accordance with the following:*

a. *The Licensee shall apply the monogram, license number, and date of manufacture to monogrammed products in accordance with a marking procedure as specified by the applicable API product specification. Where there are no API product specification marking requirements, the licensee shall define the location(s) where this information is applied.*

b. *The monogram may be applied at any time appropriate to the manufacturing process but shall be removed if the product is subsequently found to be in nonconformance with API specified requirements. Products determined to be nonconforming to API specified requirements shall not bear the API monogram.*

c. *Only an API Licensee may apply its monogram.*

d. *The monogram shall be applied at the licensed facility.*

e. *The authority responsible for applying and removing the API monogram shall be defined.*

4.4 *Records required by API product specifications shall be retained for the period of time specified therein. Records specified to demonstrate achievement of the effective operation of the quality system shall be maintained for a minimum of 5 years.*

5 API Monogram Program: API Responsibilities

5.1 *The API shall maintain, without references to licensees or users, records of reported problems encountered with API monogrammed products produced in accordance with API Specification Q1 and API product standards.*

6 API Monogram Program: User Responsibilities

6.1 *The effectiveness of the API monogram program can be strengthened by user reporting problems encountered with API monogrammed products to the API. API solicits information on both new product nonconformance with API specified requirements and field failures (or malfunctions) which are judged to be caused by either specification deficiencies or nonconformance with API specified requirements. Users are requested to report to API problems encountered with API monogrammed products.*

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Currently Eligible API Monogram Specifications as of March 1, 1999

Spec 1B, **Oil Field V-Belting**, 6th Edition, Order Number: G01B06, Price: $65.00

Spec 2B, **Fabrication of Structural Steel Pipe**, 5th Edition, Order Number: G02B05, Price: $45.00

Spec 2C, **Offshore Cranes**, 5th Edition, Order Number: G02C05, Price: $70.00

Spec 2F, **Mooring Chain**, 6th Edition, Order Number: G02F06, Price: $55.00

Spec 2H, **Carbon Manganese Steel Plate for Offshore Platform Tubular Joints**, 7th Edition, Order Number: G00540, Price: $45.00

Spec 2MT1, **As-Rolled Carbon Manganese Steel Plate With Improved Toughness for Offshore Structure**, 1st Edition, Order Number: G02MT1, Price: $50.00

Spec 2W, **Steel Plates for Offshore Structures, Produced by Thermo-Mechanical Control Processing (TMCP)**, 3rd Edition, Order Number: G00578, Price: $45.00

Spec 2Y, **Steel Plates, Quenched-and-Tempered, for Offshore Structures**, 3rd Edition, Order Number: G00590, Price: $45.00

Spec 4F, **Drilling and Well Servicing Structures**, 2nd Edition, Order Number: G04F02, Price: $60.00

Spec 5B, **Threading, Gauging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads**, 14th Edition, Order Number: G05B14, Price: $100.00

Spec 5CT, **Casing and Tubing (U.S. Customary Units)**, 6th Edition, Order Number: G05CT6, Price: $125.00

Spec 5D, **Drill Pipe**, 3rd Edition, Order Number: G01975, Price: $70.00

Spec 5L, **Line Pipe**, 41st Edition, Order Number: G05L41, Price: $125.00

Spec 5LC, **CRA Line Pipe**, 3rd Edition, Order Number: G05LC3, Price: $100.00

Spec 5LD, **CRA Clad or Lined Steel Pipe**, 2nd Edition, Order Number: G05LD2, Price: $75.00

Spec 6A, **Wellhead and Christmas Tree Equipment**, 17th Edition, Order Number: G06A17, Price: $125.00

Spec 6AV1, **Verification Test of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service**, 1st Edition, Order Number: G06AV1, Price: $45.00

Spec 6D, **Pipeline Valves (Gate, Plug, Ball, and Check Valves)**, 21st Edition, Order Number: G03200, Price: $80.00

Spec 6H, **End Closures, Connectors, and Swivels**, 2nd Edition, Order Number: G06H02, Price: $60.00

Spec 7, **Rotary Drill Stem Elements**, 39th Edition, Order Number: G07039, Price: $115.00

Spec 7F, **Oil Field Chain and Sprockets**, 5th Edition, Order Number: G03600, Price: $65.00

Spec 7K, **Drilling Equipment**, 2nd Edition, Order Number: G07K02, Price: $85.00

Spec 8A, **Drilling and Production Hoisting Equipment**, 13th Edition, Order Number: G08A13, Price: $65.00

Spec 8C, **Drilling and Production Hoisting Equipment (PSL 1 & PSL 2)**, 3rd Edition, Order Number: G08C03, Price: $75.00

Spec 9A, **Wire Rope**, 24th Edition, Order Number: G09A24, Price: $55.00

Spec 10A, **Well Cements**, 22nd Edition, Order Number: G10A22, Price: $60.00

Spec 10D, **Bow-Spring Casing Centralizers**, 5th Edition, Order Number: G10D05, Price: $55.00

Spec 11AX, **Subsurface Sucker Rod Pumps and Fittings**, 10th Edition, Order Number: G11AX0, Price: $80.00

Spec 11B, **Sucker Rods**, 26th Edition, Order Number: G11B26, Price: $70.00

Spec 11E, **Pumping Units**, 17th Edition, Order Number: G11E17, Price: $85.00

Spec 11L6, **Electric Motor Prime Mover for Beam Pumping Unit Service**, 1st Edition, Order Number: G05914, Price: $50.00

Spec 11N, **Lease Automatic Custody Transfer (LACT) Equipment**, 4th Edition, Order Number: G11N04, Price: $50.00

Spec 11P, **Packaged Reciprocating Compressors for Oil and Gas Production Services**, 2nd Edition, Order Number: G05920, Price: $90.00

Spec 11V1, **Gas Lift Valves, Orifices, Reverse Flow Valves and Dummy Valves**, 2nd Edition, Order Number: G11V12, Price: $70.00

Spec 12B, **Bolted Tanks for Storage of Production Liquids**, 14th Edition, Order Number: G12B14, Price: $60.00

Spec 12D, **Field Welded Tanks for Storage of Production Liquids**, 10th Edition, Order Number: G12D10, Price: $60.00

Spec 12F, **Shop Welded Tanks for Storage of Production Liquids**, 11th Edition, Order Number: G12F11, Price: $60.00

Spec 12GDU, **Glycol-Type Gas Dehydration Units**, 1st Edition, Order Number: G06420, Price: $70.00

Spec 12J, **Oil and Gas Separators**, 7th Edition, Order Number: G06500, Price: $60.00

Spec 12K, **Indirect-Type Oil Field Heaters**, 7th Edition, Order Number: G06600, Price: $70.00

Spec 12L, **Vertical and Horizontal Emulsion Treaters**, 4th Edition, Order Number: G12L04, Price: $60.00

Spec 12P, **Fiberglass Reinforced Plastic Tanks**, 2nd Edition, Order Number: G12P02, Price: $60.00

Spec 13A, **Drilling Fluid Materials**, 15th Edition, Order Number: G07000, Price: $70.00

Spec 14A, **Subsurface Safety Valve Equipment**, 9th Edition, Order Number: G14A09, Price: $95.00

Spec 15HR, **High Pressure Fiberglass Line Pipe**, 2nd Edition, Order Number: G15HR2, Price: $60.00

Spec 15LE, **Polyethylene (PE) Line Pipe**, 3rd Edition, Order Number: G15LE3, Price: $60.00

Spec 15LR, **Low Pressure Fiberglass Line Pipe**, 6th Edition, Order Number: G07226, Price: $60.00

Spec 15LT, **PVC Lined Steel Tubular Goods**, 1st Edition, Order Number: G07228, Price: $60.00

Spec 16A, **Drill Through Equipment**, 2nd Edition, Order Number: G16A02, Price: $90.00

Spec 16C, **Choke and Kill Systems**, 1st Edition, Order Number: G07242, Price: $85.00

Spec 16D, **Control Systems for Drilling Well Control Equipment**, 1st Edition, Order Number: G07243, Price: $70.00

Spec 16R, **Marine Drilling Riser Couplings**, 1st Edition, Order Number: G16R01, Price: $60.00

Spec 17D, **Subsea Wellhead and Christmas Tree Equipment**, 1st Edition, Order Number: G07265, Price: $85.00

Spec 17E, **Subsea Production Control Umbilicals**, 2nd Edition, Order Number: G17E02, Price: $85.00

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• American Petroleum Institute Quality Registrar	Ph: 202-962-4791 Fax: 202-682-8070
• Monogram Licensing Program	Ph: 202-962-4791 Fax: 202-682-8070
• Engine Oil Licensing and Certification System	Ph: 202-682-8233 Fax: 202-962-4739
• Petroleum Test Laboratory Accreditation Program	Ph: 202-682-8064 Fax: 202-962-4739

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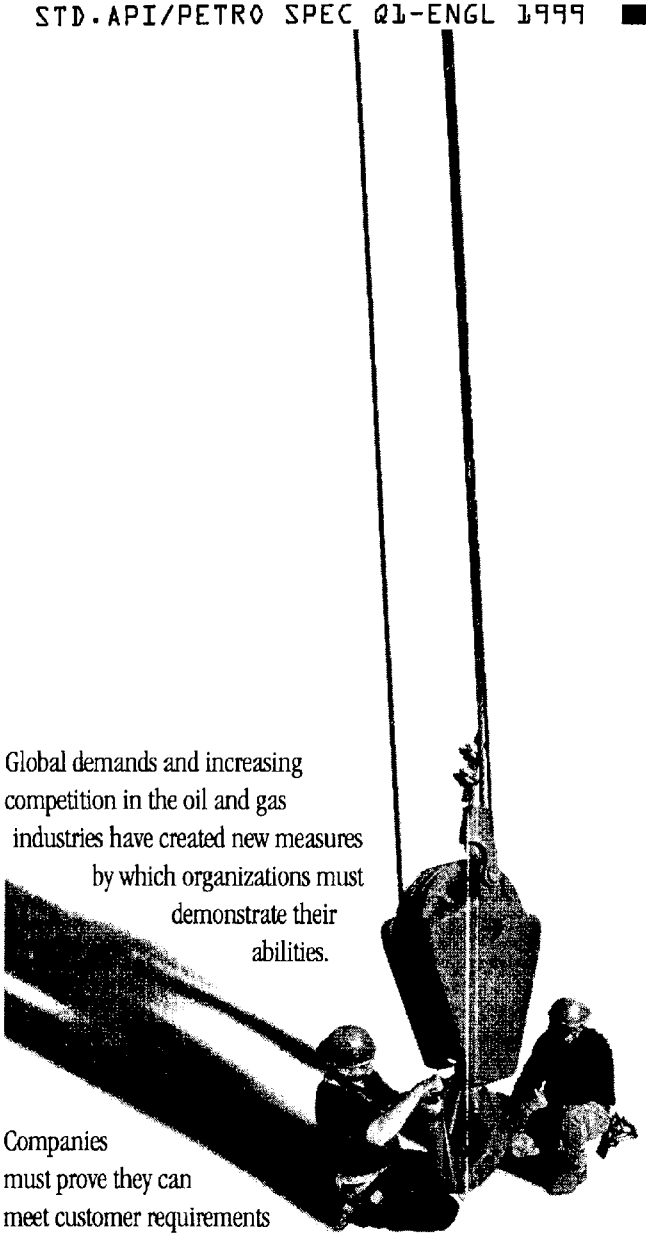
The Quest For Quality Starts Here.



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