



API STANDARDS: INTERNATIONAL USAGE AND DEPLOYMENT

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INTRODUCTION AND EXECUTIVE SUMMARY

Standards and technical regulations are essential drivers of economic growth, technology development, and global trade. In the energy sector, industry standards play a critical role in the development and spread of technologies and products used around the world every day to enhance environmental, health, safety, and sustainability performance.

While there are many standards developing organizations (SDOs) globally, this can lead to many duplicative and/or competing standards used throughout the natural gas and oil industry. Ultimately, lack of alignment in the use of standards can create inefficiencies and divergences that result in unnecessary barriers and reduced economic competitiveness.

API is a global leader in convening subject matter experts across segments to establish, maintain, and distribute consensus standards for the oil and gas industry. API's goal is to enhance operational safety, environmental protection, and sustainability across the industry, especially through global adoption of these standards. API standards are developed under API's American National Standards Institute (ANSI) accredited process, ensuring that the API standards are recognized not only for their technical rigor but also their third-party accreditation which facilitates acceptance by state, federal, and increasingly international regulators.

This Report describes the use of API standards by national regulators and standards setting bodies in 31 markets, including:

- **Europe:** Norway
- **Americas:** Argentina, Brazil, Canada, Chile, Colombia, Ecuador, Guyana, and Mexico
- **Central Asia and Middle East:** Azerbaijan, Bahrain, Iraq, Egypt, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates (UAE);
- **Indo-Pacific:** Australia, China, India, Indonesia, Japan, Malaysia, Singapore, VietNam, and;
- **Sub-Saharan Africa:** Angola, Ghana, Equatorial Guinea, Nigeria, and South Africa

The 31 markets were chosen based on the current presence of the natural gas and oil industry, expected growth regions, and legislative considerations, such as the general use of standards in technical regulations by governments. Additionally, the report is meant to expand upon the 2010 OGP Report on Regulators' Use of Standards, which covered 15 markets (many of which were in the European Union), and the 2020 version of this report, which covered 25 markets. Since the 2010 OGP Report, there has been significant development and growth in the industry, including in many emerging markets. For each of these 31 markets, API examined publicly available laws and regulations, databases of national standards and technical regulations, and operational manuals and industry practices to identify specific uses of API standards.

Unlike the 2010 Report on Regulators' Use of Standards, which covered overall use of technical standards incorporated by reference in regulations and mainly focused on upstream standards, this Report is focused primarily on the use of API standards across all segments — not only in national laws and regulations but also in policy guidance, national standards, technical manuals, and industry practice.

MAIN FINDINGS OF THE REPORT

- **API standards are widely recognized and are used actively around the globe.** Across the 31 markets, 1102 references to API standards were identified through an open source examination of laws, regulations, national standards, technical guidance, and operational manuals. This likely underestimates use of API standards in these markets, since a substantial portion of these markets' standard-setting references are not openly available, and use of API standards in some markets is governed by industry practice.
 - **References in national standards and technical regulations: Over 62 percent of the references to API standards identified were found within national standards and technical regulations.** References to API standards were found in the national standards and technical regulations of 26 of the countries analyzed: Indonesia (140),¹ Canada (106), Mexico (86), Equatorial Guinea (84), Brazil (51), Colombia (40), VietNam (42), Guyana (33), Chile (23), Ghana (19), Argentina (17), India (39), Norway (17), Singapore (14), Nigeria (13), China (11), Angola (9), Malaysia (26), Azerbaijan (17), South Africa (8), Kuwait (6), Iraq (6), Egypt (2), and Ecuador (2). These figures likely understate the use of API standards in national standards because many countries do not specify when they adopt or model national standards after international standards, and this report examined only the national standards catalogues maintained by relevant authorities (rather than each standard individually).
 - **References in best practices or technical and operational manuals: Over 37 percent of references to API standards identified were found within best practices or technical and operational manuals issued by regulators or national oil companies,** indicating that API standards have widespread practical application. References to API standards were identified in guidance issued in Mexico (279), Nigeria (43), India (20), Argentina (30), Oman (13), Malaysia (13), Saudi Arabia (11), Indonesia (9), and Qatar (8).
- **Beyond the textual references identified, API standards are widely used in industry practice in India and in the Gulf Cooperation Council member countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates).** Industry reports, corroborated by sales data for API standards, indicate the uptake of API standards in India and the GCC countries is among the highest for the markets examined in this report.
- **References to and use of API standards are not limited to a particular segment—they are widely used in regulations across upstream, midstream, and downstream sectors:**
 - 43 percent of API standards referenced pertained to upstream activities (exploration and production);
 - 30 percent pertained to downstream activities (refining and marketing);
 - 8 percent pertained to transportation; and
 - 19 percent pertained to petroleum measurements, fire safety or environmental protection potentially applicable across multiple segments.
- **For 14 of the 30 countries, API standards were identified at a disparate rate within segments:**
 - In Canada, China, Equatorial Guinea, India, Ghana, Malaysia, Saudi Arabia, and Qatar, API standards were more commonly found in the upstream sector.
 - In Azerbaijan, Chile, VietNam, Singapore, Brazil, and Colombia, API standards were more commonly found in the downstream sector.
 - For the remaining countries, API standards were identified at a roughly equivalent rate across upstream and downstream segments.

¹ In Indonesia, the Ministry of Energy and Mineral Resources has issued an overarching regulation (Regulation 1846 K/18/MEM/2018, Use of Standards in Oil and Gas Business Activities) that specifies the acceptable standards used across all oil and gas activities.

CONCLUSION

The widespread use of API standards across all markets examined demonstrates the extent to which regulators and companies rely on them to enhance environmental, health, safety, and worker performance while stimulating economic growth, technology development, and trade, in accordance with good regulatory practices. They are key to the global energy sector, streamlining regulation across borders and minimize economic inefficiencies. As the global marketplace for natural gas and oil products and services continues to grow, there are opportunities for the industry to collaborate with global companies, standards development organizations, and governance agencies to further harmonize the use of standards, technical cooperation, and adoption of API standards.



EUROPE

NORWAY

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The **Ministry of Petroleum and Energy** in Norway sets the overall policy direction for the oil and gas sector and directs policies for upstream oil and gas activities. Under the Ministry, the **Petroleum Directorate** administers oil and gas policies, including for licensing of exploration and production, and is the technical advisor to the Ministry.

For downstream activities in the gas sector, the **Norwegian Energy Regulatory Authority (RME-NVE)**, which supervises the country's electricity and gas markets, is the chief regulator. As Norway is part of the European Economic Area (EEA), the downstream natural gas market operates in alignment with the European Union's internal market rules surrounding natural gas.

The **Petroleum Safety Authority Norway (PSA)**, which sits under the Ministry of Labour and Social Inclusion, is charged with regulating the health, safety and emergency preparedness aspects of all petroleum activities. Norway also has three state-owned companies participating in the oil and gas sector: **Equinor ASA** (a publicly listed company for which the government owns a 67 percent stake), an upstream operator; **Petoro AS** (wholly state-owned), which manages the State's Direct Financial Interest (SDFI) of exploration and production licenses; and **Gassco** (wholly owned), the operator of Norway's gas pipeline network.

Meanwhile the **Ministry of Environment** and the **Norwegian Environment Agency** play key roles in assessing and regulating the environmental impacts of oil and gas operations.

The main standards body in Norway is **Standards Norway**, a non-governmental body which develops and issues standards for all sectors except for the electrotechnical and telecommunications (those sectors are covered by two other bodies—the Norwegian Electrotechnical Committee and the Norwegian Communications Authority respectively). Standards Norway manages and issues standards for the oil and gas sector; however, the Norwegian Oil and Gas Association, the Federation of Norwegian Industries, and the Norwegian Shipowners' Association all contribute to their development. These standards are referred to as NORSOK standards and are widely used in the global industry.

Finally the **Norwegian Oil and Gas Association**, which is made up of oil and gas companies operating in Norway, has also issued a series of voluntary guidelines for the oil and gas sector.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Guidelines and regulations issued by the PSA and NPD make reference to API, NORSOK, and other international standards. Three Guidelines issued by the PSA reference six API standards:

| PSA Guideline | API Standards Referenced |
|--|---|
| <i>Guidelines regarding the Technical and Operation Regulations (2020)</i> | <p>API 520, Sizing, Selection, and Installation of Pressure Relieving Devices in Refineries</p> <p>API 521, Pressure-Relieving and Depressurizing Systems</p> |
| <i>Guidelines regarding Facilities Regulations (2020)</i> | <p>API SPEC 17J, Unbonded Flexible Pipe</p> <p>API 520, Sizing, Selection, and Installation of Pressure Relieving Devices in Refineries</p> <p>API 521, Pressure-Relieving and Depressurizing Systems</p> |
| <i>Guidelines regarding the Activities Regulations (2020)</i> | API RP 17B, Flexible Pipe |

Moreover, the NPD has also issued guidance entitled Standards Relating To Measurement Of Petroleum For Fiscal Purposes And For Calculation Of CO₂-Tax, which refers to 10 chapters² of the API Manual of Petroleum Measurement Standards (MPMS), including:

- Chapter 4
- Chapter 5
- Chapter 7
- Chapter 8
- Chapter 9
- Chapter 10
- Chapter 11
- Chapter 12
- Chapter 13
- Chapter 14

The guidance also refers to *API MPMS RP 86, Recommended Practice for Measurement of Multiphase Flow*.

² API MPMS Chapters may comprise multiple individual standards, e.g. as of the date of issuance of this Report, API MPMS Chapter 4 consists of 11 individual standards, and the complete Manual consists of over 170 individual standards.

A large offshore oil rig is the central focus, situated in the middle of the ocean. The rig is a complex of steel structures, including a tall derrick and several cranes. In the background, a large supply vessel is visible, and the horizon shows a clear blue sky and distant landmasses.

AMERICAS

ARGENTINA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The primary regulator at the federal level in Argentina is the **Secretariat of Energy** within the **Ministry of Energy and Mining**, which enacts nationwide measures to regulate oil and gas activity. However, oil and gas rights can also belong to the provincial territories where the reserves are located, permitting resource-controlling provincial governments to negotiate and set the terms of upstream activities. In some cases, provincial governments have also enacted regulations governing local oil and gas operations. For example, the provincial Ministry of Energy and Natural Resources of Neuquén oversees regulation of the Neuquén and Vaca Muerta production areas.

For transportation and distribution of natural gas specifically, the **Federal Gas Regulatory Entity (ENARGAS)** is the chief regulator. Environmental aspects of oil and gas activities are also overseen by both the **Federal Ministry of Environment and Sustainable Development** and the provincial environmental regulators.

The Law of Hydrocarbons No. 17319, as amended, is the primary legal authority for oil and gas activities in Argentina. It provides holders of concession rights with the authority to conduct exploration and production activities “according to the most rational and efficient techniques” and also authorizes holders of concession rights to develop and maintain oil and gas transportation infrastructure “subject to the general legislation and technical standards in force.”

The federal Secretariat of Energy has issued at least three technical regulations pertaining to the transport of oil and gas that make reference to international standards:

- *Resolution No. 571/2019, Specific Rules and Technical Conditions for the Transport of Liquid Oil by Pipeline and Through Maritime and River Terminals*
- *Resolution No. 120-E/2017, Technical Regulations for Transport of Liquid Hydrocarbons by Pipeline*
- *Resolution No. 951/2015, Technical Regulations for Transport of Liquid and Gaseous Hydrocarbons by Submarine Pipelines*

While it typically does not issue regulation specific to the oil and gas sector, Argentina's **Ministry of Production and Labor** is responsible for overseeing overall industrial production in Argentina, and is authorized to issue technical regulations for certain industrial products. It has issued Resolution 92/2019, the Specific Technical Regulation that Establishes the Technical Quality and Safety Requirements for Products Identified as Industrial Valves, Including Their Bodies and Covers, which incorporates international oil and gas standards.

Argentina's national standards development organization is the private, non-profit **Argentine Institute of Standardization and Certification (IRAM)**. For the oil and gas sector, IRAM collaborates with the **Argentinean Institute for Oil and Gas (IAPG)** to develop and issue standards. Together they have developed 172 standards currently in force (coded as IRAM IAPG A). These are voluntary unless specifically cited and made mandatory by Argentinian regulations. IRAM has also issued 16 recommended practices, some of which cite other international standards.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Resolution No. 120-E/2017, Technical Regulations for Transport of Liquid Hydrocarbons by Pipeline, permits the use of 5 API standards:

- *API 1110, Pressure Testing of Steel Pipelines For The Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids or Carbon Dioxide*
- *API RP 1160, Managing System Integrity for Hazardous Liquid Pipelines*
- *API 570, Piping Inspection Code*
- *API RP 579, Fitness-For-Service*
- *API RP 2200, Repairing Hazardous Liquid Pipelines*

Resolution No. 571/2019, Specific Rules and Technical Conditions for the Transport of Liquid Oil by Pipeline and Through Maritime and River Terminals, requires relevant measurement procedures to be conducted according to the API Manual of Petroleum Standards.

Resolution 92/2019, the Specific Technical Regulation that Establishes the Technical Quality and Safety Requirements for Products Identified as Industrial Valves, permits the use of 11 API standards:

- *API SPEC 6A, Wellhead and Christmas Tree Equipment*
- *API SPEC 6D, Pipeline and Piping Valves*
- *API 594, Check Valves: Flanged, Lug, Wafer, and Butt-welding*
- *API 598, Valve Inspection and Testing*
- *API 599, Metal Plug Valves—Flanged, Threaded, and Welding Ends*
- *API 600, Steel Gate Valves - Flanged and Butt-welding Ends, Bolted Bonnets*
- *API 602, Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries*
- *API 623, Steel Globe Valves—Flanged and Butt-welding Ends, Bolted Bonnets*
- *API SPEC 20A, Carbon Steel, Alloy Steel, Stainless Steel, and Nickel Base Alloy Castings for Use in the Petroleum and Natural Gas Industry*
- *API SPEC 20B, Open Die Shaped Forgings for Use in the Petroleum and Natural Gas Industry*
- *API SPEC 20C, Closed Die Forgings for Use in the Petroleum and Natural Gas Industry*

The [catalog of standards](#) published by IRAM and IAPG does not indicate the normative references included in each standard, but companies have reported that some are modeled on API or other international standards. Some pertaining to the safety electrical apparatuses used for explosive gas atmospheres are adopted from IEC standards, as indicated by their titles (i.e., IRAM-IAPG-IEC 79-4, Electrical apparatus for explosive gas atmospheres, Part 4: Method of test ignition Temperature).

However, 8 of the 27 voluntary recommended practices issued by IAPG reference 30 API standards. They are:

| IAPG Recommended Practice | API Standards Referenced |
|--|--|
| <i>PR IAPG-SCo-14-2017-00, Use of ERFV pipes (Epoxy Reinforced with Fiberglass) in Surface Installations</i> | <i>API 15 LR Specification for Low Pressure Fiberglass Line Pipe</i> <i>API 15 HR Specification For High Pressure Fiberglass Line Pipe</i> <i>API 15TL4, Recommended Practice for Care and Use of Fiberglass Tubulars</i> |
| <i>PR IAPG-SC-12-2015-00, Energy Monitoring of Process Furnaces</i> | <i>API 560, Fired Heaters for General Refinery Service</i> <i>API 530, Calculation of Heater-tube Thickness in Petroleum</i> <i>API RP 535, Burners for Fired Heaters in General Refinery Services</i> <i>API RP 573, Inspection of Fired Boilers and Heaters</i> <i>API RP 556, Instrumentation, Control, and Protective Systems for Gas Fired Heaters</i> |
| <i>PR IAPG-SCo-05-2011-00, Basic Requirements for Assembly and Maintenance of Individual Pumping Devices (AIB)</i> | <i>API SPEC 11E, Specifications for Pumping Units</i> <i>API SPEC 11ER, Guarding of Pumping Units</i> <i>API RP 11G, Recommended Practice for Installation, Maintenance, and Lubrication of Pumping Units</i> |
| <i>PR IAPG - SC 20 - 2020 - 00, Taking Inventories of Greenhouse Gases in Hydrocarbon Exploration and Production Activities and Gas Processing</i> | <i>API Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Gas Industry (August 2009)</i> |
| <i>PR IAPG-SC-18-2020-00 Surgence Control Systems in Tower Equipment</i> | <i>API SPEC 6A, Wellhead and Tree Equipment</i> <i>API 53, Well Control Equipment Systems for Drilling Wells</i> <i>API RP 54, Occupational Safety and Health for Oil and Gas Well Drilling and Servicing Operations.</i> <i>API RP 59, Recommended Practice for Well Control Operations</i> <i>API SPEC 16A, Drill-Through Equipment</i> <i>API 16AR, Repair and Remanufacture of Drill-through Equipment</i> <i>API SPEC 16C, Choke and Kill Equipment</i> <i>API SPEC 6D, Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment</i> |

| IAPG Recommended Practice | API Standards Referenced |
|---|---|
| <p><i>PR IAPG - SC - 26 - 2021 - 00, Selection of Instruments, Patterns and Maximum Allowable Errors</i></p> | <p><i>API Manual of Petroleum Measurement Standards (MPMS), Chapter 7</i></p> <p><i>API MPMS, Chapter 5</i></p> <p><i>API MPMS, Chapter 9</i></p> <p><i>API MPMS, Chapter 21</i></p> |
| <p><i>PR IAPG - SC - 24 - 2021 - 00, Technical Verification, Inspection and Care of Structures of Drilling Equipment and Well Service</i></p> | <p><i>API SPEC 4F, Drilling and Well Servicing Structures</i></p> <p><i>API RP 4G, Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures</i></p> <p><i>API RP 54, Occupational Safety and Health for Oil and Gas Well Drilling and Servicing</i></p> <p><i>API SPEC Q2, Quality Management for Service Supply Organizations for the Petroleum and Natural Gas Industry</i></p> |
| <p><i>PR IAPG - SC - 22 - 2021 - 00, Tolerances for Product Custody Transfer and Plant Balances</i></p> | <p><i>API MPMS, Chapter 13</i></p> <p><i>API MPMS, Chapter 19</i></p> |

BRAZIL

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The **National Council for Energy Policy (CNPE)**, an inter-ministerial council that advises the President of Brazil on energy policies, sets broad guidelines and makes high level decisions for Brazil's oil and gas sector. Additionally, the **Ministry of Mines and Energy** and its **National Petroleum, Natural Gas and Biofuels Agency (ANP)** issue regulations and directly oversee upstream and downstream oil and gas activities in Brazil.

Brazilian law also requires the involvement of the state-owned national oil company, **Petrobras**, in some types of exploration and production activities. Petrobras also participates in downstream operations. The environmental impacts of oil and gas activities are subject to regulation by the **Federal Environmental Protection Agency (IBAMA)**.

Brazil's government standards and certification agency is the **National Institute of Metrology, Standardization and Industrial Quality (INMETRO)** within the Ministry of Development, Industry and Foreign Trade. INMETRO requires compliance with certain mandatory standards and technical regulations, including those for the oil and gas sector. Current mandatory standards and technical regulations for the oil and gas sector are:

- *Conformity Requirements for Transportable Containers for Liquefied Petroleum Gas – LPG*
- *Conformity Requirements for Low Pressure Regulators for Liquefied Petroleum Gases (LPG) with Flow Capacity up to 4 kg / h*
- *Conformity Requirements for Transportable Liquefied Petroleum Gas (LPG) Reclassifier Service*
- *Conformity Requirements for Aerial Storage Tanks for Petroleum Products and Other Fuels*
- *Conformity Requirements for Plasticized PVC Liquefied Petroleum Gas (LPG) Hoses*

INMETRO's relevant voluntary standards and technical regulations include:

- *Conformity Requirements for Industrial Valves for Oil Exploration, Production, Refining and Transportation Installations*

Brazil's national private, non-profit standards development organization, **Brazilian Association of Technical Standards (ABNT)**, also contributes significantly to standards development. While ABNT's standards are voluntary, many are referenced by INMETRO's compulsory standards and technical regulations. Within ABNT are the technical committees responsible for developing standards; this includes the Committee on Materials, Equipment and Ocean Structures for the Oil and Natural Gas Industry, whose technical secretariat is the **Pontifical Catholic University of Rio de Janeiro**. ABNT has issued over 400 standards relevant to the oil and gas sector.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

The standards issued by INMETRO for the oil and gas sector reference international standards such as ISO, ASME, IEC, and ANSI standards. However, no INMETRO standards, whether voluntary or required, directly reference API standards.

On the other hand, ABNT's voluntary standards for the oil and gas sector make normative reference to API standards as well as other international standards, including ISO, ASME, and EN standards. 20 ABNT standards make 51 references to API standards, including the API Manual of Petroleum Measurement Standards (MPMS):

| ABNT Standard | API Standards Referenced |
|--|--|
| <p>ABNT NBR 15273:2021, Induction curves for oil, by-products and natural gas transportation system through pipelines</p> | <p><i>API SPEC 5L, Line Pipe</i></p> |
| <p>ABNT NBR 16799:2019, Storage of Flammable and Combustible Liquids - Management of Fires in Atmospheric Storage Tanks</p> | <p><i>API RP 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents</i></p> <p><i>API RP 2023, Guide for Safe Storage and Handling of Heated Petroleum-Derived Asphalt Products and Crude-Oil Residua</i></p> <p><i>API SPEC 12B:1995, Bolted Tanks for Storage of Production. Liquids</i></p> |
| <p>ABNT NBR 15358:2017, Fuel gas internal network in non-residential use installations until 400 kPa — Design and construction</p> | <p><i>API SPEC 5L, Seamless Line Pipe</i></p> <p><i>API 1104, Standard for Welding Pipelines and Related Facilities</i></p> |
| <p>ABNT NBR 16165:2017 Induction bends for process piping - Requirements</p> | <p><i>API SPEC 6A, Specification for Wellhead and Tree Equipment</i></p> |
| <p>ABNT NBR 15280-1:2017, Onshore pipeline Part 1: Design</p> | <p><i>API RP 1102, Steel Pipelines Crossing Railroads and Highways</i></p> <p><i>API SPEC 5L, Seamless Line Pipe</i></p> <p><i>API SPEC 6D, Specification for Pipeline Valves</i></p> <p><i>API 594, Check Valves: Flanged, Lug, Wafer, and Butt-welding</i></p> <p><i>API 599, Metal Plug Valves-Flanged, Threaded and Welding Ends</i></p> <p><i>API 600, Steel Gate Valves - Flanged and Butt-welding Ends, Bolted Bonnets</i></p> <p><i>API 602, Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries</i></p> |
| <p>ABNT NBR 15827:2018, Industrial valves for installations of exploration, production, refining and transport of petrol products - Requirements for design and prototype test</p> | <p><i>API 594, Check Valves: Flanged, Lug, Wafer, and Butt-welding</i></p> <p><i>API 598, Valve Inspection and Testing</i></p> <p><i>API 599, Metal Plug Valves-Flanged, Threaded and Welding Ends</i></p> <p><i>API 600, Steel Gate Valves - Flanged and Butt-welding Ends, Bolted Bonnets</i></p> <p><i>API 602, Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries</i></p> <p><i>API 609, Butterfly Valves: Double Flanged, Lug- and Wafer-Type</i></p> <p><i>API SPEC 6D, Pipeline Valves</i></p> |

| ABNT Standard | API Standards Referenced |
|--|---|
| ABNT NBR 13523:2019 , Liquefied petroleum gas central storage - LPG | <i>API SPEC 5L, Seamless Line Pipe</i> |
| ABNT NBR 15280-2:2015 Versão Corrigida:2016 , Onshore pipeline Part 2: Construction and installation | <i>API RP 1110, Recommended Practice for the Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids, or Carbon Dioxide</i> <i>API 1104, Standard for Welding Pipelines and Related Facilities</i> |
| ABNT NBR 15793:2016 | <i>API RP 5C6, Pipe with Welded Connectors</i> <i>API SPEC 8C, Drilling and Production Hoisting Equipment</i> |
| ABNT NBR 17505-7:2015, Storage of flammable and combustible liquids Part 7: Fire protection for parks with stationary storage tanks | <i>API 620, Design and Construction of Large, Welded, Low-Pressure Storage Tanks</i> |
| ABNT NBR 16381:2015 EN, Onshore and offshore pipelines - Pig-trap ABNT NBR 16381:2015 Onshore and offshore pipelines — Scraper-trap | <i>API SPEC 6D, Specification for Pipeline Valves</i> |
| ABNT NBR 17505-5:2015, Storage of flammable and combustible liquids Part 5: Operations | <i>API 2016, Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks</i> <i>API RP 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents</i> <i>API 2015, Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks</i> |
| ABNT NBR 17505-2:2015, Storage of flammable and combustible liquids Part 2: Tank and recipient storage | <i>API 2000, Venting Atmospheric and Low-Pressure Storage Tanks</i> <i>API 620, Design and Construction of Large, Welded, Low-Pressure Storage Tanks</i> <i>API SPEC 12B, Specification for Bolted Tanks for Storage of Production Liquids</i> <i>API SPEC 12F, Specification for Shop Welded Tanks for Storage of Production Liquids</i> <i>API 2350, Overfill Protection for Storage Tanks in Petroleum Facilities</i> <i>API 653, Tank Inspection, Repair, Alteration, and Reconstruction</i> |

| ABNT Standard | API Standards Referenced |
|---|--|
| ABNT NBR 16020:2011, Electronic liquid measurement — Flow computers | <i>API MPMS</i> |
| Measurement of gas by multipath ultrasonic meters | <i>API MPMS Chapter 14</i> |
| ABNT NBR 15216:2010, Storage of flammable and combustible liquids—Quality control on storage, transportation and supply in aviation fuels | <i>API/IP SPEC 1581, Specifications and Qualification Procedures for Aviation Jet Fuel Filter Separators</i> <i>API/IP STD 1542, Identification Markings for Dedicated Aviation Fuel Manufacturing and Distribution Facilities</i> <i>API 1529, Aviation Fueling Hose</i> |
| ABNT NBR 15921-4:2011, Petroleum and natural gas industries - Composite piping Part 4: Fabrication, installation and operation | <i>API SPEC 5B, Threading, Gauging, and Inspection of Casing, Tubing, and Line Pipe Threads</i> |
| ABNT NBR 15600:2010, Compressed natural gas storage and decompressing station - Design, construction and operation | <i>API 1104, Standard for Welding Pipelines and Related Facilities</i> <i>API 600, Cast Steel Valves</i> |
| ABNT NBR 12236:1994, Criteria of project, building and operation of compressed fuel gas filling station - Procedure | <i>API 618, Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services</i> <i>API RP 520, Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries</i> <i>API RP 550, Manual on Installation of Refinery Instruments and Control Systems</i> <i>API SPEC 11P, Specification for packaged Reciprocating Compressors for Oil and Gas Production Services</i> <i>API 601, Metallic Gaskets For Raised-face Pipe Flanges And Flanged Connections</i> <i>API 605, Large-Diameter Carbon Steel Flanges</i> |

CANADA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

Regulation of natural gas and oil in Canada takes place primarily at the provincial level. The federal government, through the Canadian Energy Regulator (CER), has responsibility over interprovincial pipelines and trade, as well as some authority over offshore reserves and in frontier areas (Northwest Territories, Nunavut and the territorial sea), pursuant to the **Canadian Energy Regulator Act (CER Act)**.

Each province has jurisdiction over its resources and is responsible for approval of natural gas and oil project applications and oversight and regulation. Provincial regulators in Canada include:

- the **Alberta Energy Regulator (AER)**;
- the **British Columbia Oil and Gas Commission**
- the **Saskatchewan Ministry of Energy and Resources (ER)**
- the **Petroleum Branch** of the Manitoba provincial government
- the **Department of Energy and Mines (DEM)** of New Brunswick
- the **Ontario Ministry of Natural Resources and Forestry (MNR)**

Federal and provincial authorities share jurisdiction over offshore petroleum reserves. Legislation has been introduced to establish cooperation between the different levels of government. The **Canada-Newfoundland and Labrador Offshore Petroleum Board** and the **Canada-Nova Scotia Offshore Petroleum Board**, both consisting of federal and provincial representatives, regulate every aspect of offshore development.

The **Standards Council of Canada (SCC)** is an independent body designated to promote the participation of Canadians in standards activities. SCC serves as Canada's national standards organization, and provides accreditation to standards development bodies. Accredited standards development bodies include the **Canadian Standards Association (CSA)**, which has issued over 3,000 standards; and the Canadian General Standards Board, a body within the government of Canada that has developed over 350 standards including for petroleum.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Individual provinces have jurisdiction over natural resources and the regulation of natural gas and oil activities. Accordingly, provincial governments have issued laws and accompanying regulatory guidance for industry that incorporate international standards, including a total of 108 references to API standards.

| Alberta | |
|---|--|
| Measure | References to API Standards |
| Manual 012: Energy Development Applications | API SPEC 5L, Line Pipe |
| Manual 011: How to submit volumetric data to the AER – October 2019 | API Manual of Petroleum Measurement Standards (MPMS) |
| Directive 008: Surface Casing Depth Requirements | API RP 64: Recommended Practices for Diverter Systems Equipment and Operations |

Alberta (cont.)

| Measure | References to API Standards |
|--|--|
| Directive 010: Minimum Casing Design Requirement (2022) – | <p><i>API RP 5C1: Recommended Practice for Care and Use of Casing and Tubing</i></p> <p><i>API SPEC 5CT: Specification for Casing and Tubing</i></p> <p><i>API Bulletin 5C3: Formulas and Calculations for Casing, Tubing, Drill Pipe and Line Pipe Properties</i></p> |
| Directive 017: Measurement Requirements for Oil and Gas Operations (2022) | API Manual of Petroleum Measurement Standards |
| Directive 046: Production Audit Handbook – January 2003 | API Manual of Petroleum Measurement Standards |
| Directive 036: Drilling Blowout Prevention Requirements and Procedures – March 2019 | <p><i>API SPEC 6A: Wellhead and Christmas Tree Equipment</i></p> <p><i>API RP 5C1: Care and Use of Casing and Tubing</i></p> <p><i>API RP 5A3: Thread Compounds for Casing, Tubing, and Line Pipe</i></p> |
| Directive 055: Storage Requirements for the Upstream Petroleum Industry | <p><i>API 2610: Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities</i></p> <p><i>API 653: Tank Inspection, Repair, Alteration, and Reconstruction</i></p> <p><i>API Standard 2350: Overfill Protection for Storage Tanks in Petroleum Facilities, Fourth Edition</i></p> <p><i>API RP 1604: Closure of Underground Petroleum Storage Tanks</i></p> <p><i>API RP 575: Inspection Practices for Atmospheric and Low-Pressure Storage Tanks</i></p> <p><i>API RP 652: Linings of Aboveground Petroleum Storage Tank Bottoms</i></p> |
| Directive 060: Upstream Petroleum Industry Flaring, Incinerating, and Venting | <i>API 521: Pressure-relieving and Depressuring Systems</i> |
| Directive 073: Requirements for Inspection and Compliance of Oil Sands Mining and Processing Plant Operations in the Oil Sands | API Manual of Petroleum Measurement Standards |

British Columbia

Measure

[Oil and Gas Activity Operations Manual – Version 1.33: August 2021](#)

References to API Standards

API Standard 521: Pressure-relieving and Depressuring Systems

API 53, Well Control Equipment Systems for Drilling Wells

API 620: Design and Construction of Large Welded Low-Pressure Storage Tanks

API 650: Welded Steel Tanks for Oil Storage

API 651: Cathodic Protection for Above-Ground Petroleum Storage Tanks

API 652: Lining of Above-Ground Petroleum Storage Tanks

API 653: Tank Inspection, Repair, Alteration, and Reconstruction

API RP 1604, Closure of Underground Petroleum Storage Tanks

API 2000: Venting Atmospheric and Low-Pressure Storage Tanks

API 2015: Cleaning Petroleum Storage Tanks

API 2350: Overfill Protection for Petroleum Storage Tanks

API 2550: Measurements and Calibration of Petroleum Storage Tanks

API RP 14B: Design, Installation, Repair and Operation of Subsurface Safety Valve Systems

Saskatchewan

| Measure | References to API Standards |
|---|--|
| Directive PNG017: Measurement Requirements for Oil and Gas Operations | API Manual of Petroleum Measurement Standards |
| Guidelines for the Construction and Monitoring of Oily Byproduct Storage Structures in Saskatchewan | API 620, Design and Construction of Large, Welded, Low Pressure Storage Tanks API 650, Welded Tanks for Oil Storage |
| Directive S-01: Saskatchewan Upstream Petroleum Industry Storage Standards | <i>API Publication 351: Overview of Soil Permeability Test Methods</i> <i>API 620: Design and Construction of Large Welded Low-Pressure Storage Tanks</i> <i>API Standard 650: Welded Steel Tanks for Oil Storage</i> <i>API SPEC 12D: Field-welded Tanks for Storage of Production Liquids</i> <i>API SPEC 12F: Shop-welded Tanks for Storage of Production Liquids</i> <i>API SPEC 12P: Fiberglass Reinforced Plastic Tanks</i> |
| Directive PNG034: Saskatchewan Pipelines Code | <i>API RP 573, Inspection of Fired Boilers and Heaters</i> |

Manitoba

Measure

[The Oil and Gas Act \(C.C.S.M. c. O34\)](#)

References to API Standards

API RP 4G: Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures

New Brunswick

Measure

[NB Reg 87-97: Petroleum Product Storage and Handling Regulation](#)

References to API Standards

API Standard 620: Recommended Rules for Design and Construction of Low-Pressure Storage Tanks

API Standard 650: Welded Steel Tanks for Oil Storage

API 2000: Venting Atmospheric and Low-Pressure Storage Tanks

API Specification 5L: Specification for Line Pipe

API Specification 12B: Specification for Bolted Production Tanks

API Specification 12D: Specification for Large Field Welded Production Tanks

API Specification 12F: Specification for Shop Welded Tanks for Storage of Production Liquids

Newfoundland & Labrador /

Nova Scotia

Measure

[Data Acquisition and Reporting Guidelines](#)

References to API Standards

API RP 13-B-1: Recommended Practice for Field Testing Water-Based Drilling Fluid

API RP 13B-2: Recommended Practice for Field Testing Oil-Based Drilling Fluid

API RP 31A: Standard Form for Hardcopy Presentation of Downhole Well Log Data

API RP 40: Recommended Practice for Core Analysis

API RP 44: Recommended Practice for Sampling Petroleum Reservoir Fluids

API RP 45: Recommended Practice for Analysis of Oilfield Waters

API RP 66: Recommended Digital Log Interchange Standard (DLIS)

Newfoundland & Labrador/ Nova Scotia (cont.)

Measure

References to API Standards

Drilling and Production Guidelines

API Standard 53: BOP Equipment Systems for Drilling

API Standard 65: Isolating Potential Flow Zones

API SPEC 4F: Drilling and Well Servicing Structures

API SPEC 6A: Wellhead and Christmas Tree Equipment

API SPEC 6FA: Fire Test for Valves

API SPEC 7-1: Rotary Drilling Stem Elements

API SPEC 8A, 8C: Drilling and Production Hoisting Equipment

API SPEC 9A: Wire Rope

API SPEC 10A: Cements and Materials for Well Cementing

API SPEC 13A: Drilling Fluid Materials

API SPEC 14A: Subsurface Safety Valve Equipment

API SPEC 16A: Drill-through Equipment

API SPEC 16C: Choke and Kill Equipment

API SPEC 16D: Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment

API SPEC 16F: Marine Drilling Riser Equipment

API SPEC 16R: Design, Rating and Testing of Marine Drilling Riser Couplings

API SPEC 17D: Design and Operation of Subsea Production systems – Subsea Wellhead and Tree Equipment

API RP 5C7: Recommended Practice for Coiled Tubing Operations in Oil and Gas Well Services

API RP 8B: Inspection, Maintenance, Repair, and Remanufacture of Hoisting Equipment

API RP 9B: Application, Care and Use of Wire Rope for Oilfield Service

API RP 10B: Testing Well Cements

API RP 13-B-1: Field Testing Water-Based Drilling Fluid

API RP 13B-2: Field Testing Oil-Based Drilling Fluid

API RP 14B: Design, Installation, Operation, Test, and Redress of Subsurface Safety Valve Systems

Newfoundland & Labrador/ Nova Scotia (cont.)

| Measure | References to API Standards |
|---|---|
| Drilling and Production Guidelines (cont.) | <p><i>API RP 16Q: Design, Selection, Operation and Maintenance of Marine Drilling Riser Systems</i></p> <p><i>API RP 17A: Design and Operation of Subsea Production Systems</i></p> <p><i>API RP 17G: Design and Operation of Completion/ Workover Riser Systems</i></p> <p><i>API RP 64: Diverter Systems Equipment and Operations</i></p> <p><i>API RP 90: Annular Casing Pressure Management for Offshore Wells</i></p> <p><i>API RP 131: Laboratory Testing Drilling Fluids</i></p> |
| Offshore Waste Treatment Guidelines | <p><i>API RP 13B-2: Procedure for Field Testing Oil Based Drilling Muds</i></p> |
| Measurement Guidelines under the Newfoundland and Labrador and Nova Scotia Offshore Areas Drilling and Production Regulations | <p>API Manual of Petroleum Measurement Standards</p> |
| Data Acquisition and Reporting Guidelines – October 2011 | <p><i>API RP 13B-1: Field Testing Water-Based Drilling Fluid</i></p> <p><i>API RP 13B-2: Field Testing Oil-Based Drilling Fluid</i></p> <p><i>API RP 31A: Standard Form for Hardcopy Presentation of Downhole Well Log Data</i></p> <p><i>API RP 40: Core Analysis</i></p> <p><i>API RP 44: Sampling Petroleum Reservoir Fluids</i></p> <p><i>API RP 45: Analysis of Oilfield Waters</i></p> <p><i>API RP 66: Recommended Digital Log Interchange Standard</i></p> |
| Offshore Waste Treatment Guidelines – December 2010 | <p><i>API RP 13B-2: Field Testing Oil-Based Drilling Fluid</i></p> |
| Safety Directive: Security of Offshore Installations and Facilities | <p><i>API 70: Security for Worldwide Offshore Oil and Natural Gas Operations</i></p> |
| Canada-Nova Scotia Offshore Marine Installations and Structures Occupational Health and Safety Transitional Regulations | <p><i>API SPEC 8A, 8C: Drilling and Production Hoisting Equipment</i></p> <p><i>API SPEC 2C, 2D: Offshore Pedestal-mounted Cranes</i></p> <p><i>API RP 8B: Inspections, maintenance, repair and remanufacture of hoisting equipment</i></p> |

Newfoundland & Labrador/ Nova Scotia (cont.)

| Measure | References to API Standards |
|---|---|
| Canada-Newfoundland and Labrador Offshore Marine Installations and Structures Occupational Health and Safety Transitional Regulations | <p><i>API SPEC 8A: Drilling and Production Hoisting Equipment</i></p> <p><i>API RP 8B: Inspections, Maintenance, Repair and Remanufacture of Hoisting Equipment</i></p> <p><i>API SPEC 8C: Specification for Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)</i></p> <p><i>API SPEC 2C: Off-shore Pedestal-mounted cranes</i></p> <p><i>API RP 2D: Operation and Maintenance of Off-shore Cranes</i></p> |

Ontario

| Measure | References to API Standards |
|--|--|
| Oil, Gas and Salt Resources of Ontario, Provincial Operating Standards | <p><i>API SPEC 5CT: Specifications for Casing and Tubing</i></p> <p><i>API RP 5A5: Field Inspection of New Casing, Tubing, and Plain End Line Pipe</i></p> <p><i>API RP 5C1: Care and Use of Casing and Tubing</i></p> <p><i>API Bulletin 5C2: Bulletin on Performance Properties of Casing and Tubing</i></p> <p><i>API Bulletin 5C4: Bulletin on Round Thread Casing Joint Strength with Combined Internal Pressure and Bending</i></p> <p><i>API SPEC 6A: Wellhead and Christmas Tree Equipment</i></p> <p><i>API SPEC 10: Class of Cement</i></p> <p><i>API SPEC 10A: Materials and Testing for Oil Well Cements</i></p> |

CHILE

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The Ministry of Energy is the primary government body that oversees all energy resources in Chile. The **National Energy Commission** is a public and decentralized body that advises the Ministry of Energy on all matters related to the energy sector and its development. The National Energy Commission's main functions are to analyze the prices and tariffs of goods and services, fix technical and quality norms, monitor, and project current and anticipated functioning of the energy sector, and to monitor and propose legal and regulatory norms.

Since the 1970s, Chile's national oil company, **Empresa Nacional del Petróleo (ENAP)**, has been entitled to exploit Chile's oil and gas reservoirs. Chile authorizes third parties exploit its oil and gas reservoirs on behalf of ENAP through special operations contracts (CEOPs), which operate as licenses issued by the Ministry of Energy. In other words, though all hydrocarbon reservoirs are owned by the state, exploration and exploitation can be performed by ENAP or a private party with a CEOP. CEOPs can also set rules for how to operate activities in the upstream sector.

Beyond the Ministry of Energy, the **Ministry of Economy, Development, and Tourism** and the **Ministry of Health** have also issued regulations related to safety of midstream and downstream oil and gas operations. For the downstream gas sector, Chile's electricity regulator, the **Superintendency of Electricity and Fuels (SEC)** also supervises the management of operations and certification of electrical and gas products, including setting specific standards for gas products.

The **National Institute for Standardization (Instituto Nacional de Normalización (INN))** is a member of the International Organization for Standardization (ISO), and is the only organization charged with creating Chile's national standards. The INN is a private foundation created by Corporación de Fomento de la Producción (CORFO), Chile's economic development agency. The INN's main functions are to develop technical standards at national level, manage the National Accreditation System and the coordination of a National Metrological Network, and promote sales of standards, training activities, and technical publications.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

The Ministry of Energy and the National Energy Commission, the Ministry of Economy, and the Ministry of Health have all issued decrees that reference a total of 23 API standards.

| Regulation | Issuer | API References |
|--|--------------------|---|
| Safety Regulation for Liquefied Petroleum Gas Storage, Transportation and Distribution Facilities and Associated Operations (Decree 108, 2014) | Ministry of Energy | <p><i>API 2510, Design and Construction of Liquefied Petroleum Gas (LPG) Installations</i></p> <p><i>API 2510A, Fire-Protection Considerations for the Design and Operation of Liquefied Petroleum Gas (LPG) Storage Facilities</i></p> <p><i>API RP 580, Risk-Based Inspection</i></p> <p><i>API RP 581, Risk-Based Inspection Methodology</i></p> <p><i>API RP 579-1, Fitness for Service</i></p> <p><i>API 510, Pressure Vessel Inspection Code</i></p> <p><i>API RP 570, Piping Inspection Code & Inspector Certification</i></p> |

| Regulation | Issuer | API References |
|---|---------------------|--|
| Safety Regulation for Facilities and Operations of Production and Refining, Transportation, Storage, Distribution and Supply of Liquid Fuels (Decree 160, 2020) | Ministry of Economy | <p><i>API 500, Classification of Locations for Electrical Installations at Petroleum Facilities</i></p> <p><i>API 570, Piping Inspection Code & Inspector Certification</i></p> <p><i>API 620, Design and Construction of Large, Welded, Low-Pressure Storage Tanks</i></p> <p><i>API 650, Welded Tanks for Oil Storage</i></p> <p><i>API 653, Tank Inspection, Repair, Alteration, and Reconstruction</i></p> <p><i>API RP 750, Management of Process Hazards</i></p> <p><i>API 1104, Welding of Pipelines and Related Facilities</i></p> <p><i>API 1160, Managing System Integrity for Hazardous Liquid Pipelines</i></p> <p><i>API 2000, Venting Atmospheric and Low-Pressure Storage Tanks</i></p> <p><i>API RP 1004, Bottom Loading and Vapor Recovery for MC-306 & DOT-406 Tank Motor Vehicles</i></p> <p><i>API RP 1615, Installation of Underground Petroleum Storage Systems</i></p> <p><i>API RP 2001, Fire Protection in Refineries</i></p> |
| Regulation of Interior Installations and Gas Meters (Decree 66, 2007) | Ministry of Economy | <p><i>API 1104, Welding of Pipelines and Related Facilities</i></p> <p><i>API SPEC 5L, Line Pipe</i></p> |
| Safety Regulation for the Transportation and Distribution of Network Gas (Decree 280, 2010) | Ministry of Economy | <i>API RP 570, Piping Inspection Code & Inspector Certification</i> |
| Regulation for the Storage of Hazardous Substances (Decree 43, 2016) | Ministry of Health | <i>API 650, Welded Tanks for Oil Storage</i> |

COLOMBIA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The **Ministry of Mines and Energy (MME)** in Colombia is the chief regulator in charge of issuing general upstream and downstream rules for the oil and gas sector, while the **National Hydrocarbons Agency (ANH)** executes contracts and agreements with private parties to allow participation in exploration and production. For midstream and downstream operations involving gas, the **Commission on Regulation of Energy and Gas (CREG)** is the primary regulator.

Colombia's **Ministry of Environment and Sustainable Development** ensures that oil and gas activities comply with environmental laws and regulations. Unlike many other Latin American countries, however, Colombia's national state-owned oil and gas company, **Ecopetrol** does not generally possess regulatory authority.

MME has issued [Resolution 181495 of 2009](#) (subsequently updated by Resolution 40098 of 2015), which requires that "national and international technical standards and norms must be applied" to oil and gas exploration and production, "especially those recommended by AGA, API, ASTM, NFPA, NTC-ICONTEC, RETIE or their modified forms...used in the oil industry." Similarly, Resolution 40066 of 2022 regulating flaring and fugitive methane emissions incorporates similar language requiring the use of international standards "especially those recommended by AGA, API, ASTM, NFPA, NTCICONTEC, and RETIE or their modifications or substitutes."

In addition, MME has also issued regulations that include technical regulations and procedures, that may be modeled on or reference international standards, including:

- Resolution 72145 of 2014, which governs the transport of crude oil via pipeline; and
- Resolution 09341, which governs exploration and production of unconventional reservoirs.

Similarly, for the natural gas sector, CREG has issued Resolution 071, providing technical rules for the transport of natural gas resources.

Colombia's national standards development organization is the non-profit, private **Colombian Institute of Technical Standards and Certification (ICONTEC)**. ICONTEC is active in developing and issuing Colombian national standards, coded as NTC. For the oil and gas sector, ICONTEC has issued over 140 standards, which are mostly voluntary but may be made mandatory by regulation.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

API standards are referred to in many Colombian technical regulations and standards.

MME Resolution 181495 of 2009 directly requires compliance with international standards for exploration and production, "especially those recommended by AGA, API, ASTM, NFPA, NTC-ICONTEC, RETIE or their modified forms... used in the oil industry." However, Resolution 181495 does not refer to or require compliance to any specific standards.

Additionally, Article 17 of Resolution 72145 governing pipeline transport of crude oil requires that operators "install equipment and implement the necessary procedures for the measurement and quality determinations of crude oil, in accordance with current international standards, such as API, ASME, and ASTM." Resolution 72145 also does not refer to any specific standards.

MME Resolution 40066 of 2022, one of the first pieces of national regulation covering control and reduction of methane emissions, requires compliance with international standards, naming specifically API standards among others. Two specific API publications referenced by Resolution 40066 include:

- API 537, Flare Details for Petroleum, Petrochemical, and Natural Gas Industries
- API Compendium of Greenhouse Gas Emissions 2009

The national standards issued by ICONTEC incorporate as normative references international standards such as API, ISO, ASTM, and NFPA standards. Most of those that reference API involve steel pipes for wells, transport and distribution of gas, or handling of aviation fuel. According to ICONTEC's database of national standards, 19 national standards refer directly to 38 API standards. They are:

| Colombian National Standard | API Standard Referenced |
|---|---|
| <p><i>NTC 4713: Steel Pipes for Use as Casing or Tubing For Wells in Petroleum and Natural Gas Industries</i></p> | <p><i>API RP 5A3: Recommended Practice on Threat Compounds for Casing, Tubing and Line Pipe and Drill Stem Elements</i></p> <p><i>API TR 5C3: Technical Report on Equations and Calculations for Casing, Tubing and Line Pipe Used as Casing or Tubing; and Performance Properties Tables for Casing and Tubing</i></p> <p><i>API Spec 5B: Specification for Threading, Gauging and Thread Inspection of Casing, Tubing and Line pipe Threads</i></p> |
| <p><i>NTC 6276: Production, Storage, and Handling of Liquefied Natural Gas (LNG)</i></p> | <p><i>API 6D: Specification for Pipeline Valves, 2007</i></p> <p><i>API 620: Design and Construction of Large, Welded, Low-Pressure Storage Tanks, 2008</i></p> <p><i>API 625: Tank Systems for Refrigerated Liquefied Gas Storage, 2010</i></p> <p><i>API 2510: Design and Construction of Liquefied Petroleum Gas (LPG) Installations, 2010</i></p> |
| <p><i>NTC 5897: Load and Unload Stations of Compressed Natural Gas</i></p> | <p><i>API RP 520: Sizing, Selection and Installation of Pressure-Relieving Devices in Refineries</i></p> <p><i>API RP 521: Guide for Pressure-Relieving and Depressuring systems</i></p> <p><i>API STD 526: Flanged Steel Pressure Relief Valves</i></p> <p><i>API SPEC 12K: Specification for Indirect Type Oil-Field Heaters</i></p> |
| <p><i>NTC 5773: Terrestrial Transport Systems for Compressed Natural Gas</i></p> | <p><i>API RP 520: Recommended Practice for the Design and Installation of Pressure-Relieving Systems in Refineries</i></p> <p><i>API RP 576: Recommended Practice for the Inspection of Pressure Relieving Devices</i></p> |

| Colombian National Standard | API Standard Referenced |
|---|--|
| <p><i>NTC 5261: Handling of Aviation Gasoline Supply</i></p> | <p><i>API 1529: Aviation Fueling Hose</i></p> <p><i>API / IP 1542: Airport Marking for Fuel Identification</i></p> <p><i>API / IP 1581: Specification and Qualification Procedures for Aviation Jet Fuel Filter / Separators</i></p> <p><i>API / IP 1583: Specification and Qualification Procedures for Aviation Fuel Filter Monitors with Absorbent Type Elements</i></p> <p><i>API / IP 1590: Specification and Qualification Procedures for Aviation Fuel Microfilters</i></p> |
| <p><i>NTC 5011: Handling of Aviation Fuel in Mobile Containers</i></p> | <p><i>API / IP 1542: Airport Equipment Making for Fuel Identification</i></p> <p><i>API IP 1581: Specifications and Qualification Procedures for Aviation Jet Fuel</i></p> <p><i>API / IP 1583: Specifications and Qualification Procedures for Aviation Fuel Filter Monitors with Absorbent Type Elements</i></p> <p><i>API / IP 1590: Specification and Qualification Procedures for Aviation Fuel Microfilters</i></p> |
| <p><i>NTC 4643: Handling of Aviation Turbo Fuel</i></p> | <p><i>API 1529: Aviation Fueling Hose</i></p> <p><i>API / IP 1542: Airport Equipment Making for Fuel Identification</i></p> <p><i>API IP 1581: Specifications and Qualification Procedures for Aviation Jet Fuel</i></p> <p><i>API / IP 1583: Specifications and Qualification Procedures for Aviation Fuel Filter Monitors with Absorbent Type Elements</i></p> <p><i>API / IP 1590: Specification and Qualification Procedures for Aviation Fuel Microfilters</i></p> |
| <p><i>NTC 5716: Lubricating Oils for Internal Combustion Engines, for Four-Stroke Motorcycles</i></p> | <p><i>API 1509: Engine Oil Licensing and Certification System</i></p> |

| Colombian National Standard | API Standard Referenced |
|---|--|
| <p><i>NTC 4643: Handling of Aviation Turbo Fuel Refueling</i></p> | <p><i>API 1529: Aviation Fueling Hose</i></p> <p><i>API / IP 1542: Airport Equipment Marking for Fuel Identification</i></p> <p><i>API IP 1581: Specifications and Qualification Procedures for Aviation Jet Fuel</i></p> <p><i>API / IP 1583: Specifications and Qualification Procedures for Aviation Fuel Filter Monitors with Absorbent Type Elements</i></p> <p><i>API / IP 1590: Specification and Qualification Procedures for Aviation Fuel Microfilters</i></p> |
| <p><i>NTC 4642: Handling of Turbofuel for Aviation Storage</i></p> | <p><i>API 1529: Aviation Fueling Hose</i></p> <p><i>API / IP 1542: Airport Equipment Marking for Fuel Identification</i></p> <p><i>API IP 1581: Specifications and Qualification Procedures for Aviation Jet Fuel</i></p> <p><i>API / IP 1590: Specification and Qualification Procedures for Aviation Fuel Microfilters</i></p> |
| <p><i>NTC 1295: Petroleum and Petroleum Products. Lubricants Oils for Carter in Gasoline, Operation Dual Natural Gasoline/Gas for Vehicles (Four Times) and Diesel (Four and Two Times) Internal Combustion Engines</i></p> | <p><i>API 1509: Engine Oil Licensing and Certification System, 2002</i></p> |

ECUADOR

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The **Ministry of Energy and Non-Renewable Natural Resources (MENNR)** is the chief regulator for oil and gas in Ecuador, granting licensing and mining rights to private sector participants. Additionally, the **Agency for Hydrocarbon Regulation and Control (ARCH)** oversees all upstream and downstream oil and gas operations, and the **Ministry of Environment** plays a role in ensuring operations comply with environmental laws and regulations.

Ecuador has two state-owned oil companies, **Empresa Pública de Exploración y Explotación de Hidrocarburos (Petroamazonas)** and **Empresa Pública de Hidrocarburos del Ecuador (Petroecuador)** which generally have preferential access to Ecuador's oil and gas resources and that partner with suppliers and contractors on relevant projects. The two companies are expected to merge by the end of 2020, according to Executive Decree 723, issued on April 24, 2019

Ecuador's Law on Hydrocarbons provides MENNR the legal authority to promote exploration, production, industrialization, and transport of hydrocarbons according to "the best international practices." MENNR's Operational Regulation for Hydrocarbon Activities, which sets out the terms for conducting upstream and downstream activities, requires oil and gas operators to "apply the norms, standards, procedures, and best practices of the national and international hydrocarbon industry."

Ecuador's national standards development organization is the **Ecuadorean Institute of Standardization (INEN)** under the **Ministry of Industry and Productivity**, which develops and issues voluntary standards (coded as NTE INEN) and [mandatory technical regulations](#) (coded as PRTE INEN or RTE INEN). According to INEN's website, there are five mandatory technical regulations relevant to the oil and gas sector:

- *RTE INEN 028, Combustibles*
- *RTE INEN 008, Welded Steel Tanks and Cylinders for Liquefied Petroleum Gas and its Technical Assemblies*
- *RTE INEN 024, Transport, Storage, Packaging, and Distribution of Liquefied Petroleum Gas (LPG) in Cylinders and Tanks*
- *RTE INEN 039, Function of Vehicles with Liquefied Petroleum Gas (LPG)*
- *RTE INEN 207, Steel Pipes Used in Oil and Gas Industries for Coating and Production of Wells*

Moreover, INEN has issued over 230 national voluntary standards (NTE INEN) relevant to the oil and gas sector, some of which are cited by mandatory technical regulations.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

The INEN mandatory technical standards refer to a wide variety of international standards, including API, NTE INEN, ISO, IEC, EN, and ANSI. One of them, *RTE INEN, 207, Steel Pipes Used in Oil and Gas Industries for Coating and Production of Wells*, refers to two API standards. They are:

- *API 5B, Threading, Gauging, and Inspection of Casing, Tubing, and Line Pipe Threads*
- *API SPEC 5CT, Specification for Casing and Tubing*

INEN's [catalog](#) of national voluntary standards does not indicate which standards include normative references to other international or foreign standards. A significant portion, however are adopted from ISO standards, and include ISO in the title. These include:

- *NTE INEN-ISO 3104, Oil Products. Transparent and Opaque Liquids. Determination of Cinematic Viscosity and Calculation of Dynamic Viscosity (ISO 3104: 1994);*
- *NTE INEN-ISO 3405, Petroleum Products. Determination of Atmospheric Pressure Distillation Characteristics (ISO 3405: 2011);*
- *INEN-ISO 28460, Petroleum and Natural Gas Industries. Facilities and Equipment for Liquid Natural Gas. Land Navigation Interface and Port Operations (ISO 28460: 2010); and*
- *NTE INEN-ISO 13686, Natural Gas. Designation of Quality (ISO 13686: 1998).*

GUYANA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The discovery of new resources in Guyana in the mid-2010s spurred the development of a stronger regulatory framework for the natural gas and oil sector, a process which is still ongoing. At the time of publication, the **Department of Energy** within the **Ministry of the Presidency** has been charged with overseeing the sector, including exploration and production (the country does not yet have capacity for many downstream activities, such as refining). The **Guyana Energy Agency** has also historically regulated many midstream and downstream activities, including the import/export, transport, storage, wholesale, and retail of natural gas and oil.

Given the ongoing reform process for the energy sector, other government agencies, including the **Department of the Environment** (also within the Ministry of the Presidency), the **Guyana Environmental Protection Agency**, or the **Ministry of Natural Resources**, will also play greater roles in regulating different aspects of natural gas and oil activity in Guyana.

The primary legislation governing the natural gas and oil sector is the Petroleum (Exploration and Production) Act, passed in 1986. However, the government is still in the process of modernizing its natural gas and oil laws and regulations, in partnership with external experts, including from the World Bank and the Inter-American Development Bank.

The **Guyanese National Bureau of Standards (GNBS)**, a semi-autonomous agency within the Ministry of Business, is the national standards development organization. It is governed by the National Standards Council, made up of representatives from government and the private sector. According to its website, it has developed over 100 standards (abbreviated GYS), though development of standards for the natural gas and oil standards sector has only begun recently.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

API and the International Association of Oil and Gas Producers (IOGP) have collaborated closely with both the Department of Energy and GNBS on adoption of global standards and best practices, including API standards. As of June 2022, the GNBS has formally adopted 33 API standards, including:

1. *API MPMS Chapter 2.2A Measurement and Calibration of Upright Cylindrical Tanks by the Manual Strapping Method*
2. *API MPMS Chapter 3.1A Standard Practice for the Manual Gauging of Petroleum and Petroleum Products*
3. *API MPMS 3.1B-Tank Gauging Section 1B- Level Measurement of Liquid Hydrocarbons In Stationary Tanks By Automatic Tank Gauging*
4. *API MPMS Chapter 4 Proving Systems – Section 2 Displacement Provers*
5. *API MPMS Chapter 4 Proving Systems - Section 4 Tank Provers*
6. *API MPMS Chapter 4 Proving Systems - Section 9 Methods of Calibration for Displacement and Volumetric Tank Provers - Part 2 Determination of the Volume of Displacement and Tank Provers by the Waterdraw Method of Calibration*
7. *API MPMS Chapter 5 Metering - Section 2 Measurement of Liquid Hydrocarbons by Displacement Meters*
8. *API MPMS Chapter 5 Metering - Measurement of Liquid Hydrocarbons by Turbine Meters*
9. *API MPMS Chapter 5 Metering – Section 6 Measurement of Liquid Hydrocarbons by Coriolis Meters*
10. *API MPMS Chapter 5.8 Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters*
11. *API MPMS Chapter 6.1 Lease Automatic Custody Transfer (LACT) Systems*
12. *API MPMS Chapter 7 Temperature Determination*

13. *API MPMS Chapter 8.1 Standard Practice for Manual Sampling of Petroleum and Petroleum Products*
14. *API MPMS Chapter 8.2 Standard Practice for Automatic Sampling of Petroleum and Petroleum Products*
15. *API MPMS Chapter 9.1 Standard Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method*
16. *API MPMS Chapter 9.2 Standard Test Method for Density or Relative Density of Light Hydrocarbons by Pressure Hydrometer*
17. *API MPMS Chapter 9.3 Standard Test Method for Density, Relative Density, and API Gravity of Crude Petroleum and Liquid Petroleum Products by Thermohydrometer Method*
18. *API MPMS Chapter 10.3 Standard Test Method for Water and Sediment in Crude Oil by the Centrifuge Method (Laboratory Procedure)*
19. *API MPMS Chapter 10.4 Determination of Water and/or Sediment in Crude Oil by the Centrifuge Method (Field Procedure)*
20. *API MPMS Chapter 11—Physical Properties Data - Section 1—Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils Volume*
21. *API MPMS Chapter 11.5.1—Physical Properties Data - Section 5 Density/Weight/Volume Intraconversion - Part 1—Conversions of API Gravity at 60 °F*
22. *API MPMS Chapter 12 Calculation of Petroleum Quantities - Section 2 Using Dynamic Measurement Methods and Volumetric Correction Factors - Part 1—Introduction*
23. *API MPMS Chapter 12 Calculation of Petroleum Quantities – Section 2 Using Dynamic Measurement Methods and Volumetric Correction Factors - Part 2—Measurement Tickets*
24. *API MPMS Chapter 12—Calculation of Petroleum Quantities - Section 2 Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors - Part 3 Proving Report*
25. *API MPMS Chapter 12 Calculation of Petroleum Quantities – Section 2 Using Dynamic Measurement Methods and Volumetric Correction Factors – Part 4 Calculation of Base Prover Volumes by the Waterdraw Method*
26. *API MPMS Chapter 12 Calculation of Petroleum Quantities – Section 2 Using Dynamic Measurement Methods and Volumetric Correction Factors - Part 5—Base Prover Volume Using Master Meter Method*
27. *API MPMS Chapter 13 Statistical Aspects of Measuring and Sampling – Section 2 Methods of Evaluating Meter Proving Data*
28. *API MPMS Chapter 13.3 Measurement Uncertainty*
29. *API MPMS Chapter 14—Natural Gas Fluids Measurement - Section 1—Collecting and Handling of Natural Gas Samples for Custody Transfer*
30. *API MPMS Chapter 14.3.1 Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids—Concentric Square-Edged Orifice Meters, Part 1: General Equations and Uncertainty Guidelines*
31. *API MPMS Chapter 21 Flow Measurement Using Electronic Metering Systems—Electronic Gas Measurement*
32. *API Q1 Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry*
33. *API Q2 Specification for Quality Management System Requirements for Service Supply Organizations for the Petroleum and Natural Gas Industries*

MEXICO

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

Reforms to the Mexican Constitution in 2013 opened the natural gas and oil market up to private sector participants, in addition to Petróleos Mexicanos (PEMEX), the national state-owned oil company. Natural gas and oil resources are still owned by the government, and private companies may participate in bidding procedures for awarding exploration and extraction contracts. New government regulatory bodies are continuing to issue administrative regulations relating to natural gas and oil activities, with federal, local, and municipal permits required for the construction and operation of pipelines.

Regulatory bodies in Mexico include:

- The National Hydrocarbon Commission (CNH), which organizes tender procedures to award contracts for exploration and extraction, and manages and supervises contracts;
- The Energy Regulatory Commission (CRE), which regulates downstream natural gas activities
- The National Agency of Industrial Safety and Environmental Protection of the Hydrocarbons Sector (ASEA), which regulates health, safety, and environmental protection aspects of natural gas and oil activities
- PEMEX, which continues to be a major operator in the sector, also shapes the development of hydrocarbons in Mexico.

The major laws and regulations governing natural gas and oil are provided by Articles 25, 27, and 28 of Mexico's Federal Constitution, and the Hydrocarbons Law and its associated regulations. These laws lay out rules for private individuals and companies to participate in exploration and production activities, the type of contractual arrangements that the Mexican Government, through CNH, can use for exploration and extraction contracts; and establish rules regarding midstream and downstream activities.

The General Directorate of Standards (DGN) is Mexico's national standards body, and is responsible for preparing various types of technical standards in coordination with relevant government agencies. Official Mexican Standards (abbreviated NOM) are mandatory technical regulations to be applied to products, processes, and services, including in the natural gas and oil sector. NOM are developed by CRE and ASEA for the sector.

In addition, there are voluntary Mexican Standards (NMX) developed by the Secretariat of Economy or industry bodies, and Reference Standards (RF) developed by certain publicly administrated entities (such as PEMEX), to be applied to goods and services that they acquire, lease, or hire when national or international standards do not cover the relevant requirements, or their specifications are obsolete or inapplicable.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Several NOM standards make reference to API standards, as indicated below, along with other international standards including ISO. In addition, ASEA, CNH and CRE have issued regulatory guidance that makes substantial reference to API standards. In total, 366 references to API standards were identified.

Mandatory NOM standards make 86 references to API standards:

NOMS Issued by ASEA

| NOM | API Standard Referenced |
|---|--|
| Norma Oficial Mexicana NOM-005-ASEA-2016: Design, Construction, Operation and Maintenance of Service Stations for Storage and Sale of Diesel and Gasoline | <p><i>API RP 1615: Installation of Underground Hazardous Substances or Petroleum Storage Systems</i></p> <p><i>API RP 1621: Bulk Liquid Stock Control at Retail Outlets</i></p> |
| NORMA Oficial Mexicana NOM-007-ASEA-2016, Transportation of Natural Gas, Ethane and Gas Associated With Mineral Coal through Pipelines | <p><i>API SPEC 5L: Line Pipe</i></p> <p><i>API SPEC 6D: Pipeline And Piping Valves</i></p> <p><i>API RP 5L1: Railroad Transportation of Line Pipe</i></p> <p><i>API RP 5LW: Transportation of Line Pipe on Barges and Marine Vessels</i></p> <p><i>API RP 2201: Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries</i></p> <p><i>API 521: Guide for Pressure-Relieving and Depressuring System</i></p> <p><i>API 526: Flanged Steel Pressure-relief Valves</i></p> <p><i>API 570: Piping Inspection Code</i></p> <p><i>API 1104: Welding of Pipelines and Related Facilities</i></p> |
| NORMA Oficial Mexicana NOM-003-ASEA-2016, Distribution of Natural Gas and Liquefied Petroleum through Pipelines | <p><i>API 1104: Welding of Pipelines and Related Facilities</i></p> <p><i>API RP 5L1: Railroad Transportation of Line Pipe</i></p> <p><i>API RP 5LW: Transportation of Line Pipe on Barges and Marine Vessels</i></p> <p><i>API SPEC 5L: Line Pipe</i></p> <p><i>API SPEC 6D: Line Pipe Valves</i></p> |

NOMS Issued by ASEA

| NOM | API Standard Referenced |
|---|--|
| <p><u>NORMA Oficial Mexicana de Emergencia NOM-EM-004-ASEA-2017, Specifications and Requirements Regarding Industrial Safety, Operational Safety and Environmental Protection for the Design, Construction, Pre-start, Operation, Maintenance, Closure and Dismantling of Service Stations With a Specific Purpose for the Sale to the Public of Liquefied Petroleum Gas, by Means of Partial or Total Filling of Portable Pressure Vessels</u></p> | <p><i>API 510: Pressure Vessel Inspection Code</i></p> <p><i>API 520: Sizing, Selection, and Installation of Pressure-relieving Devices</i></p> <p><i>API 526: Flanged Steel Pressure Relief Valves</i></p> <p><i>API 570: Piping Inspection Code</i></p> <p><i>API RP 572: Inspection of Pressure Vessels</i></p> <p><i>API RP 574: Inspection Practices for Piping System Components</i></p> <p><i>API-579-1: Fitness-For-Service</i></p> <p><i>API 580: Risk-Based Inspection</i></p> <p><i>API 608: Metal Ball Valves-Flanged, Threaded and Welding End</i></p> <p><i>API 2510: Design and Construction of LPG Installations</i></p> |
| <p><u>NORMA Oficial Mexicana NOM-006-ASEA-2017, Specifications and Technical Criteria for Industrial Safety, Operational Safety and Environmental Protection for the Design, Construction, Pre-start, Operation, Maintenance, Closure and Dismantling of Onshore Oil and Petroleum Storage Facilities, Except for Liquefied Petroleum Gas</u></p> | <p><i>API 650: Welded Steel Tanks for Oil Storage</i></p> <p><i>API 1632: Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems</i></p> <p><i>API 2015: Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks</i></p> <p><i>API 2610: Design, Construction, Operation, Maintenance, and Inspection of Terminal & Tank Facilities</i></p> |
| <p><u>NORMA Oficial Mexicana NOM-006-ASEA-2017, Specifications and Technical Criteria for Industrial Safety, Operational Safety and Environmental Protection for the Design, Construction, Pre-start, Operation, Maintenance, Closure and Dismantling of Onshore Oil and Petroleum Storage Facilities, Except for Liquefied Petroleum Gas</u></p> | <p><i>API 650: Welded Steel Tanks for Oil Storage</i></p> <p><i>API 1632: Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems</i></p> <p><i>API 2015: Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks</i></p> <p><i>API 570: Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems</i></p> <p><i>API 594: Dual Plate Check Valves</i></p> <p><i>API 598: Valve Inspection and Testing</i></p> <p><i>API 599: Metal Plug Valves-Flanged, Threaded, and Welding Ends</i></p> <p><i>API 600: Cast Steel Valves</i></p> |

NOMS Issued by ASEA

| NOM | API Standard Referenced |
|---|---|
| <p><u>NORMA Oficial Mexicana NOM-006-ASEA-2017, Specifications and Technical Criteria for Industrial Safety, Operational Safety and Environmental Protection for the Design, Construction, Pre-start, Operation, Maintenance, Closure and Dismantling of Onshore Oil and Petroleum Storage Facilities, Except for Liquefied Petroleum Gas (cont.)</u></p> | <p><i>API 602: Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries</i></p> <p><i>API 607/6FA: Fire Safe Ball Valve Manufacturer</i></p> <p><i>API 609: Butterfly Valves: Double-flanged, Lug-and Wafer-type</i></p> <p><i>API 620: Design and Construction of Large, Welded, Low-pressure Storage Tanks</i></p> <p><i>API 623: Steel Globe Valves-Flanged and Butt-welding Ends, Bolted Bonnets</i></p> <p><i>API 652: Linings of Aboveground Petroleum Storage Tank Bottoms</i></p> <p><i>API 653: Tank inspection, repair and reconstruction</i></p> <p><i>API 2000: Venting Atmospheric and Low-Pressure Storage Tanks</i></p> <p><i>API RP 520: Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries</i></p> <p><i>API RP 651: Cathodic Protection of Aboveground Petroleum Storage Tanks</i></p> <p><i>API RP 1004: Bottom Loading and Vapor Recovery for MC-306 Tank Motor Vehicles</i></p> <p><i>API 2610: Design, Construction, Operation, Maintenance, and Inspection of Terminal & Tank Facilities</i></p> |
| <p><u>NORMA Oficial Mexicana NOM-013-ASEA-2021, Liquefied Natural Gas Storage and Regasification Facilities</u></p> | <p><i>API 620: Design and Construction of Large, Welded, Low-Pressure Storage Tanks</i></p> |

NOMS Issued by ASEA

| NOM | API Standard Referenced |
|---|--|
| <p>Norma Oficial Mexicana NOM-009-ASEA-2017, Administration of the structure of pipelines for the collection, transport and distribution of hydrocarbons, oil products and petrochemicals</p> | <p><i>API 579: Fitness for Service</i></p> <p><i>API RP-1110: Recommended Practice for the Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids or Carbon Dioxide</i></p> <p><i>API 1156: Effects of Smooth and Rock Dents on Liquid Petroleum Pipeline</i></p> <p><i>API 1163: In-Line Inspection Systems Qualification</i></p> <p><i>API RP-1160: Managing System Integrity for Hazardous Liquid Pipelines</i></p> <p><i>API 1173: Pipeline safety management systems</i></p> |
| <p>NORMA Oficial Mexicana de Emergencia NOM-EM-003-ASEA-2016, Specifications and technical criteria for Industrial Safety, Operational Safety and Environmental Protection for the Design, Construction, Pre-Start-up, Operation and Maintenance of onshore Petroleum Products Storage facilities, except for Liquefied Petroleum Gas</p> | <p><i>API RP 520: Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries</i></p> <p><i>API RP 1004: Bottom Loading and Vapor Recovery for MC-306 Tank Motor Vehicles</i></p> <p><i>API 421: Design and operation of oil-water separators</i></p> <p><i>API 521: Pressure-relieving and Depressuring Systems</i></p> <p><i>API 594: Dual Plate Check Valves</i></p> <p><i>API 599: Metal Plug Valves-Flanged, Threaded, and Welding Ends</i></p> <p><i>API 600: Cast Steel Valves</i></p> <p><i>API 602: Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries</i></p> <p><i>API 609: Butterfly Valves: Double-flanged, Lug-and Wafer-type</i></p> <p><i>API 623: Steel Globe Valves-Flanged and Butt-welding Ends, Bolted Bonnets</i></p> <p><i>API 650: Welded Steel Tanks for Oil Storage</i></p> <p><i>API 653: Tank inspection, repair and reconstruction</i></p> <p><i>API 1632: Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems</i></p> |

NOMS Issued by ASEA

| NOM | API Standard Referenced |
|---|--|
| <u>NORMA Oficial Mexicana de Emergencia NOM-EM-003-ASEA-2016, Specifications and technical criteria for Industrial Safety, Operational Safety and Environmental Protection for the Design, Construction, Pre-Start-up, Operation and Maintenance of onshore Petroleum Products Storage facilities, except for Liquefied Petroleum Gas (cont.)</u> | <i>API 2000: Venting Atmospheric and Low-pressure Storage Tanks</i> <i>API 2015: Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks</i> <i>API 2610: Design, Construction, Operation, Maintenance, and Inspection of Terminal & Tank Facilities</i> |

NOMS Issued by CRE

| NOM | API Standard Referenced |
|--|---|
| <p>NORMA Oficial Mexicana NOM-002-SECRE-2010, Facilities for the Utilization of Natural Gas</p> | <p><i>API SPEC 5L: Line Pipe</i></p> <p><i>API SPEC 6D : Pipeline and Piping Valves</i></p> <p><i>API RP 5L1: Railroad Transportation of Line Pipe</i></p> <p><i>API RP 521: Pressure-relieving and Depressuring Systems</i></p> <p><i>API RP 526: Flanged Steel Pressure-relief Valves</i></p> <p><i>API RP 2201: Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries</i></p> <p><i>API 1104 : Welding Pipelines and Related Facilities</i></p> |
| <p>NORMA Oficial Mexicana NOM-015-SECRE-2013, Design, Construction, Security, Operation and Maintenance of Liquefied Petroleum Gas Storage Systems Through a Deposit Plant or Supply Plant That Are Directly Linked to, or Are Part of, the Liquefied Petroleum Gas Pipeline Transportation or Distribution Systems.</p> | <p><i>API 2510A: Fire Protection Considerations for the Design and Operation of Liquefied Petroleum Gas (LPG) Storage Facilities</i></p> <p><i>API SPEC 6D: Pipeline Valves</i></p> <p><i>API RP 14E: Design and Installation of Offshore Production Platform Piping Systems</i></p> <p><i>API RP 14F: Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities</i></p> <p><i>API RP 14G: Fire Prevention and Control on Open Type Offshore Production Platforms</i></p> <p><i>API RP 14J: Design and Hazards Analysis for Offshore Production Facilities</i></p> <p><i>API RP 500: Classification of Areas for Electrical Locations at Petroleum Facilities</i></p> <p><i>API 510: Pressure Vessel Inspection Code</i></p> <p><i>API 620: Design and Construction of Large, Welded, Low-Pressure Storage Tanks</i></p> <p><i>API RP 1111: Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines</i></p> |

CNH and ASEA have also issued regulatory guidance that make 279 references to API standards, including:

| Guidelines Issued by CNH | |
|--|--|
| Guidance | API Standard Referenced |
| <u>Technical Guidelines on Hydrocarbon Measurement</u> | <i>API MPMS 2.2A, Measurement and Calibration of Upright Cylindrical Tanks by the Manual Tank Strapping Method</i> |
| | <i>API MPMS 2.2D, Measurement and Calibration of Upright Cylindrical Tanks using the Internal ElectroOptical Distance Ranging Method</i> |
| | <i>API MPMS 2.7, Calibration of Gauge Tanks</i> |
| | <i>API MPMS 3.1B, Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Tanks by Automatic Tank Gauging</i> |
| | <i>API MPMS 3.3, Tank gauging: Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Pressurized Storage Tanks by Automatic Gauging</i> |
| | <i>API MPMS 3.6, Measurement of Liquid Hydrocarbons by Hybrid Tank Measurement Systems</i> |
| | <i>API MPMS 7, Temperature Determination</i> |
| | <i>API MPMS 12.1.1, Section 1: Calculation of Static Petroleum Quantities Part 1: Upright Cylindrical Tanks and Marine Vessels</i> |
| | <i>API MPMS 14.4, Converting Mass of Natural Gas Liquids and Vapors to Equivalent Liquid Volumes</i> |
| | <i>API MPMS 19.1, Evaporative Loss from Fixed-Roof Tanks</i> |
| | <i>API MPMS 19.2, Evaporative Loss from Floating-Roof Tanks</i> |
| | <i>API MPMS 19.4, Recommended Practice for the Specification of Evaporative Losses</i> |
| | <i>API MPMS 5.1, General Considerations for Measurement by Meters</i> |
| | <i>API MPMS 5.4, Accessory Equipment for Liquid Meters</i> |
| | <i>API MPMS 5.5, Fidelity and Security of Flow Measurement Pulsed-Data Transmission Systems</i> |
| | <i>API MPMS 5.2, Measurement of Liquid Hydrocarbons by Displacement Meters</i> |
| | <i>API MPMS 5.3, Measurement of Liquid Hydrocarbons by Turbine Meters</i> |

Guidelines Issued by CNH (cont.)

| NOM | API Standard Referenced |
|--|---|
| <u>Technical Guidelines on Hydrocarbon Measurement (cont.)</u> | <i>API MPMS 5.6, Measurement of Liquid Hydrocarbons by Coriolis Meters</i> |
| | <i>API MPMS 5.8, Measurement of Liquid Hydrocarbons by Ultrasonic Flowmeters Using Transit Time Technology</i> |
| | <i>API MPMS 21.2, Electronic Liquid Volume Measurement Using Positive Displacement and Turbine Meters</i> |
| | <i>API MPMS 21.2-A1, Addendum 1 to Flow Measurement Using Electronic Metering Systems, Inferred Mass</i> |
| | <i>API MPMS 4.1, Introduction [proving systems]</i> |
| | <i>API MPMS 4.2, Displacement Provers</i> |
| | <i>API MPMS 4.4, Tank Provers</i> |
| | <i>API MPMS 4.5, Master-Meter Provers</i> |
| | <i>API MPMS 4.6, Pulse Interpolation</i> |
| | <i>API MPMS 4.7, Field Standard Test Measures</i> |
| | <i>API MPMS 4.8, Operation of Proving Systems</i> |
| | <i>API MPMS 4.9.1, Introduction to the Determination of the Volume of Displacement and Tank Provers</i> |
| | <i>API MPMS 4.9.2, Determination of the Volume of Displacement and Tank Provers by the Waterdraw Method of Calibration</i> |
| | <i>API MPMS 4.9.3, Determination of the Volume of Displacement Provers by the Master Meter Method of Calibration</i> |
| | <i>API MPMS 4.9.4, Determination of the Volume of Displacement and Tank Provers by the Gravimetric Method of Calibration</i> |
| | <i>API MPMS 13.2, Statistical Methods of Evaluating Meter Proving Data</i> |
| | <i>API MPMS 11.4.1, Properties of Reference Materials Part 1—Density of Water and Water Volume Correction Factors for Calibration of Volumetric Provers</i> |

Guidelines Issued by CNH (cont.)

| NOM | API Standard Referenced |
|---|---|
| Technical Guidelines on Hydrocarbon Measurement (cont.) | <p><i>MPMS 12.2.3, Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors Part 3—Proving Reports</i></p> <p><i>API MPMS 12.2.4, Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volume Correction Factors Part 4—Calculation of Base Prover Volumes by Waterdraw Method</i></p> <p><i>API MPMS 12.2.5, Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors Part 5—Base Prover Volume Using Master Meter Method</i></p> <p><i>API MPMS 14.5, Calculation of Gross Heating Value, Relative Density, Compressibility and Theoretical Hydrocarbon Liquid Content for Natural Gas Mixtures for Custody Transfer</i></p> <p><i>API MPMS 5.5, Fidelity and Security of Flow Measurement Pulsed-Data Transmission Systems</i></p> <p><i>API MPMS 11.1, Physical Properties Data (Volume Correction Factors) (all relevant sections and tables, including computational routines)</i></p> <p><i>API MPMS 11.2.2, Compressibility Factors for Hydrocarbons: 0.350–0.637 Relative Density (60°F/60°F) and –50°F to 140°F Metering Temperature</i></p> <p><i>API MPMS 11.2.2M, Compressibility Factors for Hydrocarbons: 350–637 Kilograms per Cubic Meter Density (15 °C) and –46°C to 60°C Metering Temperature</i></p> <p><i>API MPMS 11.2.4, Temperature Correction for the Volumes of NGL and LPG Tables 23E, 24E, 53E, 54E, 59E, 60E</i></p> <p><i>API MPMS 11.2.5, Simplified Vapor Pressure Correlation for Commercial NGLs</i></p> <p><i>API MPMS 11.3.2.1, Ethylene Density</i></p> <p><i>API MPMS 11.3.3.2, Propylene Compressibility</i></p> <p><i>API MPMS 11.5, Density/Weight/Volume Intraconversion</i></p> <p><i>API MPMS 12.2.1, Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volume Correction Factors Part 1—Introduction</i></p> |

Guidelines Issued by CNH (cont.)

NOM

API Standard Referenced

[Technical Guidelines on Hydrocarbon Measurement \(cont.\)](#)

API MPMS 12.2.2, Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors Part 2—Measurement Tickets

API MPMS 12.2.3, Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors Part 3—Proving Reports

API MPMS 12.3, Calculation of Volumetric Shrinkage From Blending Light Hydrocarbons with Crude Oil

API MPMS 21.2, Electronic Liquid Volume Measurement Using Positive Displacement and Turbine Meters

API MPMS Chapter 14.3.1, Concentric, Square-Edged Orifice Meters Part 1—General Equations and Uncertainty Guidelines (ANSI/API MPMS 14.3.1-2003) (AGA Report No. 3, Part 1) (GPA 8185-90, Part 1)

API MPMS Chapter 14.3.2, Concentric, Square-Edged Orifice Meters Part 2—Specification and Installation Requirements (ANSI/API MPMS 14.3.2-2000) (AGA Report No. 3, Part 2) (GPA 8185-00, Part 2)

API MPMS Chapter 21.1, Electronic Gas Measurement

API MPMS 8.1, Sampling: Standard Practice for Manual Sampling of Petroleum and Petroleum Products

API MPMS 8.2, Sampling: Standard Practice for Automatic Sampling of Liquid Petroleum and Petroleum Products

API MPMS 8.3, Standard Practice for Mixing and handling of Liquid Samples of Petroleum and Petroleum Products

API MPMS 7.0, Temperature Determination

API MPMS 14.1, Manual of Petroleum Measurement Standards Chapter 14 - Natural Gas Fluids Measurement Section 1 - Collecting and Handling of Natural Gas Samples for Custody Transfer

API MPMS 14.6, Continuous density measurement

API MPMS 14.7, Manual of Petroleum Measurement Standards Chapter 14 - Natural Gas Fluids Measurement Section 7 - Mass Measurement of Natural Gas LiquidsGPA STD 8182

Guidelines Issued by CNH (cont.)

| NOM | API Standard Referenced |
|--|---|
| <p>Technical Guidelines on Hydrocarbon Measurement (cont.)</p> | <p><i>API MPMS 14.8, Manual of Petroleum Measurement Standards Chapter 14 - Natural Gas Fluids Measurement Section 8 -Liquefied Petroleum Gas Measurement</i></p> <p><i>API MPMS 20.1, Allocation Measurement</i></p> <p><i>API MPMS 20.3, Measurement of Multiphase Flow</i></p> <p><i>API MPMS 20.5, Recommended Practice for Application of Production Well Testing in Measurement and Allocation</i></p> <p><i>API MPMS 12.2.2., Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 2. -Measurement Tickets</i></p> <p><i>API MPMS 3.1A, Standard Practice for the Manual Gauging of Petroleum and Petroleum Products</i></p> <p><i>API RP 85, Use of Subsea Wet-gas Flowmeters in Allocation Measurement Systems</i></p> <p><i>API 12B, Specification for Bolted Tanks for Storage of Production Liquids</i></p> <p><i>API RP 14E, Recommended Practice for Design and Installation of Offshore Products Platform Piping Systems</i></p> <p><i>API RP 551, Process measurement instrumentation</i></p> <p><i>API RP 555, Process Analyzer</i></p> <p><i>API 620, Design and Construction of Large, Welded, Low-pressure Storage Tanks</i></p> <p><i>API 650, Welded Steel Tanks for Fuel Storage</i></p> <p><i>API RP 40, Recommended Practices for Core Analysis</i></p> |
| <p>Technical Information Use and Delivery</p> | <p><i>API RP 13C, Recommended Practice on Drilling Fluid Processing Systems Evaluation⁴</i></p> |
| <p>Guidelines for Well Drilling</p> | <p><i>API 14B, Design, Installation, Operation, Test, and Redress of Subsurface Safety Valve Systems</i></p> <p><i>API RP 17L2, Recommended Practice for Ancillary Equipment for Flexible Pipes and Subsea Umbilicals</i></p> <p><i>API RP 2GEO, Geotechnical and Foundation Design Considerations</i></p> <p><i>API BULL 97, Well Construction Interface Document Guidelines</i></p> |

Guidelines Issued by CNH (cont.)

NOM

API Standard Referenced

[Guidelines for Well Drilling \(cont.\)](#)

API Bull E3, Environmental Guidance Document: Well Abandonment and Inactive Well Practices for U.S. Exploration and Production Operations

API RP 13B-1, Field Testing Water-based Drilling Fluids

API RP 13B-2, Field Testing Oil-based Drilling Fluids

API RP 13D, Rheology and Hydraulics of Oil-well Drilling Fluids

API RP 14B, Subsurface Safety Valve Systems

API RP 14J, Design and Hazards Analysis for Offshore Production Facilities

API RP 7G, Drill Stem Design and Operating Limits

API RP 92U, Underbalanced Drilling Operations

API SPEC 13A, Drilling Fluids Materials

API SPEC 14A, Subsurface Safety Valve Equipment

API RP 64, Diverter Systems Equipment and Operations

API SPEC 16A, Drill-through Equipment

API SPEC 16C, Choke and Kill Equipment

API SPEC 16D, Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment

API Spec 16RCD, Drill Through Equipment Rotating Control Devices

API SPEC 17L1, Ancillary Equipment for Flexible Pipes and Subsea Umbilicals

API SPEC 2B, Fabrication of Structural Steel Pipe

API SPEC 7K, Drilling and Well Servicing Equipment

API STD 16AR, Repair and Remanufacture of Drill-through Equipment

API STD 16AR, Repair and Remanufacture of Drill-through Equipment

API STD 53, BOP equipment systems for drilling wells

Guidelines Issued by CNH (cont.)

NOM

API Standard Referenced

[Guidelines for Well Drilling \(cont.\)](#)

API SPEC 4F, Drilling and Well Servicing Structures

API STD 65-2, Isolating Potential Flow Zones During Well Construction

API TR 6AF, Capabilities of API Flanges Under Combinations of Load

API SPEC 5CRA, Corrosion Resistant Alloys

API RP 5C5, Procedures for testing of casing and tubing connections

API STD 521, Pressure relieving and depressuring systems

API SPEC 10A, Specification for Cements and Materials for Well Cementing

API SPEC 10D, Specification for Bow-string Casing Centralizers

API RP 10B, Recommended Practices for Testing Well Cements

API RP 10D, Recommended Practices for Centralizer Placement for Stop Collar Testing

API SPEC 10TR-4, Technical report on actions to take into account for the selection of activities for primary cementing report

API 5CT, Specifications for casing and tubing production

API 5C2, Bulletin performance properties of the casing, production and drilling

API SPEC 11D1, Packers and Bridge Plugs

API SPEC 5DP, Steel drill pipe

API RP 74, Occupational Safety for Onshore Oil and Gas Production Operation

API RP 75L, Guidance Document for the Development of a Safety and Environmental Management System for Onshore Oil and Natural Gas Production Operation and Associated Activities

Guidelines Issued by CNH (cont.)

NOM

API Standard Referenced

[Guidelines for Well Drilling \(cont.\)](#)

API RP 90-2, Annular Casing Pressure Management for Onshore Wells

API 14C, Analysis Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production

API RP 17N, Subsea Reliability and technical Risk management

API RP 2 MOP, Marine Operations

API RP 2A-WSD Planning, Designing, and Constructing Fixed Offshore Platforms— Working Stress Design

API RP 2RD, Design of Risers for Floating Production Systems and Tension Leg Platforms

API RP 65-2, Cementing Shallow Water Flow Zones in Deepwater Wells. Isolating Potential Flow Zones

API RP 65-1, Cementing Shallow Water Flow Zones in Deepwater Wells

API RP 49, Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide

API RP 53, Recommended Practices for Blowout Prevention Equipment Systems for Drilling Wells

API RP 54, Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations

API RP 90, Annular Casing Pressure Management for Offshore Wells

API RP 90-1, Annular Casing Pressure Management for Offshore Wells

API RP 96, Deepwater well design and construction

API Spec 16F, Specification for Marine Drilling Riser Equipment

API SPEC 17W, Subsea Capping Stacks

API RP 17B, Flexible pipe systems for subsea and marine applications

Guidelines Issued by CNH (cont.)

NOM

API Standard Referenced

[Guidelines for Well Drilling \(cont.\)](#)

API RP 16Q, Design, selection and operation of marine drilling riser systems

API RP 17A, Design and operation of subsea production systems

API SPEC 17J, Unbonded flexible pipe systems for subsea and marine applications

API SPEC 17E, Subsea Umbilicals

API RP 75, Development of a Safety and Environmental Management Program for Offshore Operations and Facilities

API SPEC 17F, Subsea production control systems

API RP 17G, Completion/ workover riser systems

API TR 1PER15K-1, Protocol for Verification and Validation of High-pressure High temperature Equipment

API HF1, Hydraulic Fracturing Operations - Well Construction and Integrity Guidelines

API HF2, Water Management Associated with Hydraulic Fracturing

API HF3, Practice for Mitigating Surface Impacts Associated Hydraulic Fracturing

API RP 76, Contractor Safety Management for Oil and Gas Drilling and Production Operations

API RP 13 B-1, Standard Practice for Field Testing Water-Based Drilling Fluids

API 13 RP B-2, Standard Practice for Field Testing Oil-Based Drilling Fluids

API GD HF1, Hydraulic Fracturing Operations – Regulation for Well Construction and Integrity

API STD 689, Collection and exchange of reliability and maintenance data for equipment

API STD 2000, Venting of atmospheric and low-pressure storage tanks

Guidelines Issued by CNH (cont.)

| Guidance | API Standard Referenced |
|--|--|
| Guidelines for Well Drilling (cont.) | <i>API 16AR, Repair and Remanufacture of Drill-through Equipment</i> <i>API 53, Well Control Equipment Systems for Drilling Wells</i> <i>API 65-2, Isolating Potential Flow Zones During Well Construction</i> <i>API TR 6AF, Technical Report on Capabilities of API Flanges Under Combinations of Load</i> <i>API BULL E3, Wellbore Plugging and Abandonment Practices</i> |

Guidelines Issued by ASEA

| Guidance | API Standard Referenced |
|---|---|
| Guide for the Development of a Risk-Based Inspection Program (IBR) in Hydrocarbon Sector Facilities | <i>API 510: Pressure Vessel Inspection Code</i> <i>API 570: Piping Inspection Code</i> <i>API 571: Damage Mechanisms Affecting Fixed Equipment in the Refining Industry</i> <i>API 574: Inspection Practices for Piping System Components</i> <i>API 579-1: Fitness-For-Service</i> <i>API 653: Tank Inspection, Repair, Alteration, and Reconstruction</i> <i>API 750: Management of Process Hazards</i> <i>API RP 580: Risk-Based Inspection</i> <i>API RP 581: Risk-Based Inspection Methodology</i> <i>API RP 584: Integrity Operating Windows</i> <i>API RP 1160: Managing System Integrity for Hazardous Liquid Pipelines</i> |

Guidelines Issued by ASEA (cont.)

Guidance

[Guidelines on Industrial Safety, Operational Safety and Protection of the Environment for Reconnaissance, Surface Exploration, Exploration, and Extraction of Hydrocarbons](#)

API Standard Referenced

API RP 53: Blowout Prevention Equipment Systems for Drilling Wells

API 65-2: Isolating Potential Flow Zones During Well Construction

API RP 7G: Drill Stem Design and Operating Limits

API RP 10D-2: Centralizer Placement and Stop-collar Testing

API RP 13B-1: Field Testing Water-based Drilling Fluids

API RP 13B-2: Field Testing Oil-based Drilling Fluids

API RP 13D: Rheology and Hydraulics of Oil-well Drilling Fluids

API RP 14B: Design, Installation, Repair and Operation of Subsurface Safety Valve Systems

API RP 14C: Analysis, Design, Installation, and Testing of Safety Systems for Offshore Production Facilities

API RP 14G: Fire Prevention and Control on Fixed Open-type Offshore Production Platforms

API RP 14H: Installation, Maintenance and Repair of Surface Safety Valves and Underwater Safety Valves Offshore

API RP 14J: Design and Hazards Analysis for Offshore Production Facilities

API RP 16Q: Design, Selection, Operation and Maintenance of Marine Drilling Riser System

API RP 65-1: Cementing Shallow-water Flow Zones in Deepwater Wells

API RP 96: Deepwater Well Design and Construction

API RP 1111: Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines

API RP 2A-WSD: Planning, Designing, and Constructing Fixed Offshore Platforms-Working Stress Design

API RP 2SIM: Structural Integrity Management of Fixed Offshore Structures

Guidelines Issued by ASEA (cont.)

| Guidance | API Standard Referenced |
|--|--|
| Guidelines on Industrial Safety, Operational Safety and Protection of the Environment for Reconnaissance, Surface Exploration, Exploration, and Extraction of Hydrocarbons (cont.) | <p><i>API RP 2MOP: Marine Operations, Petroleum and natural gas industries-Specific requirements for offshore structures-Part 6: Marine Operations</i></p> <p><i>API RP 90: Annular Casing Pressure Management for Offshore Wells</i></p> <p><i>API SPEC 5CT: Casing and Tubing</i></p> <p><i>API SPEC 5DP: Drill Pipe</i></p> <p><i>API SPEC 6A: Wellhead and Christmas Tree Equipment</i></p> <p><i>API SPEC 6AV1: Specification for Validation of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service</i></p> <p><i>API SPEC 13A: Drilling Fluids Materials</i></p> <p><i>API SPEC 14A: Subsurface Safety Valve Equipment</i></p> <p><i>API SPEC 16A: Specification for Drill through equipment</i></p> <p><i>API SPEC 17D: Design and Operation of Subsea Production Systems-Subsea Wellhead and Tree Equipment</i></p> |
| Guidelines for Industrial Safety, Operational Safety and Environmental Protection for the Simultaneous Sale of Oil and/or Natural Gas | <p><i>API SPEC 6D: Pipeline and Piping Valves</i></p> <p><i>API 510: Pressure Vessel Inspection Code</i></p> <p><i>API 520: Sizing, Selection, and Installation of Pressure-relieving Devices</i></p> <p><i>API 526: Flanged Steel Pressure Relief Valves</i></p> <p><i>API 570: Piping Inspection Code</i></p> <p><i>API 579-1: Fitness-For-Service</i></p> <p><i>API RP 545: Lightning Protection of Aboveground Storage Tanks for Flammable or Combustible Liquids.</i></p> <p><i>API RP 551: Process Measurement Instrumentation</i></p> <p><i>API RP 572: Inspection Practices for Pressure Vessels</i></p> <p><i>API RP 574: Inspection Practices for Piping System Components</i></p> <p><i>API RP 575: Inspection Practices for Atmospheric and Low-Pressure Storage Tanks</i></p> <p><i>API RP 580: Risk-Based Inspection</i></p> |

Guidelines Issued by ASEA (cont.)

Guidance

[Guidelines for Industrial Safety, Operational Safety and Environmental Protection for the Simultaneous Sale of Oil and/or Natural Gas \(cont.\)](#)

API Standard Referenced

API RP 581: Risk-based Inspection Methodology

API RP 615: Valve Selection Guide

API 594: Check Valves: Flanged, Lug, Wafer, and Butt-welding

API 600: Steel Gate Valves-Flanged and Butt-Welding Ends, Bolted Bonnets

API 602: Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries

API 603: Corrosion-Resistant, Bolted Bonnet Gate Valves-Flanged and Butt-Welding Ends

API 607: Fire test for quarter-turn Valves and Valves Equipped with non-metallic seats

API 608: Metal Ball Valves-Flanged, Threaded, and Welding Ends

API 609: Butterfly Valves: Double-Flanged, Lug- and Wafer-Type

API 610: Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries

API 622: Type Testing of Process Valve Packing for Fugitive Emissions

API 624: Type Testing of Rising Stem Valves Equipped with Flexible Graphite Packing for Fugitive Emissions

API 641: Type Testing of Quarter-Turn Valves for Fugitive Emissions

API 682: Pumps – Shaft Sealing Systems for Centrifugal and Rotary Pumps

API 1004: Bottom Loading and Vapor Recovery for MC-306 and DOT-406 Tank Motor Vehicles

API RP 1615: Installation of Underground Petroleum Storage Systems

API RP 1621: Bulk Liquid Stock Control at Retail Outlets

API RP 1632: Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems

Guidelines Issued by ASEA (cont.)

| Guidance | API Standard Referenced |
|---|--|
| <p>Guidelines for Industrial Safety, Operational Safety and Environmental Protection for the Simultaneous Sale of Oil and/or Natural Gas (cont.)</p> | <p><i>API RP 2003: Protection against Ignitions Arising Out of Static, Lightning, and Stray Currents</i></p> <p><i>API 2510: Design and Construction of LPG Installations</i></p> <p><i>API Publication 2510A: Fire Protection Considerations for the Design and Operation of Liquefied Petroleum Gas Storage facilities</i></p> <p><i>API RP 3000: Classifying and Loading of Crude Oil into Rail Tank Cars</i></p> |
| <p>Guidelines to Be Fulfilled, in the Design, Construction, Pre-start, Operation, Maintenance, Closure, Dismantling and Abandonment, for the Transfer Facilities and Operations Associated With the Activities of Transport and/or Distribution of Hydrocarbons and/or Petroleum, by Means Other Than Pipelines</p> | <p><i>API 1004: Bottom Loading and Vapor Recovery for MC -306 and DOT -406 Tank Motor Vehicles</i></p> <p><i>API 2003: Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents</i></p> <p><i>API 2510: Design and Construction of LPG Installations</i></p> <p><i>API RP 3000: Classifying and Loading of Crude Oil into Rail Tank Cars</i></p> |
| <p>Guidelines on Industrial Safety, Operational Safety and Environmental Protection for the Design, Construction, Pre-start, Operation, Maintenance, Closure, Dismantling and Abandonment of Natural Gas Liquefaction Facilities</p> | <p><i>API SPEC 6D: Pipeline and Piping Valves</i></p> <p><i>API SPEC 12F: Shop Welded Tanks for Storage of Production Liquids</i></p> <p><i>API SPEC 12K: Indirect-Type Oil Field Heaters</i></p> <p><i>API RP 2A WSD: Planning, Designing, and Constructing Fixed Offshore. Platforms—Working Stress Design</i></p> <p><i>API RP 2GEO: Geotechnical and Foundation Design Considerations</i></p> <p><i>API RP 2MET: Derivation of Metocean Design and Operating Conditions</i></p> <p><i>API RP 551: Process Measurement</i></p> <p><i>API 520: Sizing, Selection, and Installation of Pressure-relieving Devices</i></p> <p><i>API 521: Pressure-relieving and Depressuring Systems</i></p> <p><i>API 610: Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries</i></p> <p><i>API 617: Axial and Centrifugal Compressors and Expander-compressors</i></p> |

Guidelines Issued by ASEA (cont.)

| Guidance | API Standard Referenced |
|---|--|
| <p><u>Guidelines on Industrial Safety, Operational Safety and Environmental Protection for the Design, Construction, Pre-start, Operation, Maintenance, Closure, Dismantling and Abandonment of Natural Gas Liquefaction Facilities (cont.)</u></p> | <p><i>API 618: Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services</i></p> <p><i>API 619: Rotary-Type Positive-Displacement Compressors for Petroleum, Petrochemical and Natural Gas Industries</i></p> <p><i>API 620: Design and Construction of Large, Welded, Low-Pressure Storage Tanks</i></p> <p><i>API 650: Welded Steel Tanks for Oil Storage</i></p> <p><i>API 661: Petroleum, Petrochemical, and Natural Gas Industries - Air-cooled Heat Exchangers</i></p> <p><i>API 670: Machinery Protection Systems</i></p> <p><i>API 674: Positive Displacement Pumps-Reciprocating</i></p> <p><i>API 676: Positive Displacement Pumps-Rotary</i></p> <p><i>API RP 2001: Fire Protection in Refineries</i></p> |
| <p><u>Guidelines on Industrial Safety, Operational Safety and Environmental Protection, for Land Transportation through Pipelines of Petroleum, Petroleum Products and Petrochemicals</u></p> | <p><i>API SPEC 5L: Line Pipe</i></p> <p><i>API 1104: Welding of Pipelines and Related Facilities</i></p> <p><i>API-RP-2201: Safe Hot Tapping Practices in the Petroleum & Petrochemical Industries</i></p> |
| <p><u>Guidelines on Industrial Safety, Operational Safety and Environmental Protection to Carry Out the Exploration and Extraction of Hydrocarbons Activities in Non-conventional Reservoirs on Land</u></p> | <p><i>API RP 13B-1: Field Testing Water-based Drilling Fluids</i></p> <p><i>API RP 13B-2: Field Testing Oil-Based Drilling Fluids</i></p> <p><i>API RP 13C: Drilling Fluid Processing Systems Evaluation</i></p> <p><i>API RP 13D: Rheology and Hydraulics of Oil-well Drilling Fluids</i></p> <p><i>API RP 13I: Laboratory Testing of Drilling Fluids</i></p> <p><i>API RP 14B: Design, Installation, Operation, Test, and Redress of Subsurface Safety Valve Systems</i></p> <p><i>API SPEC 12A: Oil Storage Tanks with Riveted Shells</i></p> <p><i>API SPEC 12B: Bolted Tanks for Storage of Production</i></p> <p><i>API SPEC 12D: Field-welded Tanks for Storage of Production Liquids</i></p> <p><i>API SPEC 12F: Specification for Shop Welded Tanks for Storage of Production Liquids</i></p> |

Guidelines Issued by ASEA (cont.)

Guidance

[Guidelines on Industrial Safety, Operational Safety and Environmental Protection to Carry Out the Exploration and Extraction of Hydrocarbons Activities in Non-conventional Reservoirs on Land \(cont.\)](#)

API Standard Referenced

API 620: Design and Construction of Large, Welded, Low-Pressure Storage Tanks

API 650: Welded Steel Tanks for Oil Storage

API 653: Tank Inspection, Repair, Alteration, and Reconstruction

API SPEC 14A: Specification for Subsurface Safety Valve Equipment

API SPEC 5CT: Casing and Tubing

API 53: BOP Equipment Systems for Drilling

API 2000: Venting Atmospheric and Low-Pressure Storage Tanks: Nonrefrigerated and Refrigerated

API 6A: Specification for Wellhead and Christmas Tree Equipment

API STD 65-2: Isolating Potential Flow Zones During Well Construction

API 2350: Overfill Protection/or Storage Tank in Petroleum Facilities



CENTRAL ASIA & THE MIDDLE EAST

AZERBAIJAN

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The **Ministry of Energy** is the chief regulator for all natural gas and oil activities in Azerbaijan. It frequently shapes through the national oil company, the State Oil Company of Azerbaijan (SOCAR), which is active in upstream, midstream and downstream segments.

Azerbaijan has three major laws governing the sector: the Law on Use of Energy Resources (1996), the Law on Energy (1998), and the Law on Subsoil (1998). The Law on Subsoil provides that all hydrocarbon resources are owned by the government, and the Law on Energy requires private sector participants to negotiate production sharing agreements (PSAs) with the government, typically with SOCAR.

The Ministry of Energy does not generally issue detailed regulations; instead, the PSAs set out the terms and requirements for natural gas and oil operations. In fact, it is not unusual for PSAs to be voted on and approved of by the Azerbaijani Parliament.

The Azerbaijan Standardization Institute (AZSTAND), the national standards development organization, publishes and disseminates national standards. The process for developing standards is coordinated by the State Committee for Standardization, Metrology and Patents, an agency within the cabinet. AZSTAND lists 946 standards in its catalogue, a significant portion of which pertain to the natural gas and oil sectors. National standards are abbreviated with AZS.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

At least two publicly available PSAs signed by SOCAR and its partners reference API standards:

| PSA | API Standards Referenced |
|---|---|
| <i>Agreement on Shah Deniz Prospective Area</i> | API Manual of Petroleum Measurement Standards |
| <i>Agreement on Azeri and Chirag Fields and the Deep Water Portion of the Gunashli Field in the Azerbaijani Sector of the Caspian Sea</i> | API Manual of Petroleum Measurement Standards |

SOCAR's subsidiary for drilling and well services, SOCAR-AQS, obtained an API SPEC Q2 certificate on quality management for service supply organizations in January 2017.

Furthermore, the catalogue of national standards issued by AZSTAND includes 15 standards based on API standards.

| AZS Standard | API Standards Referenced |
|---|---|
| <i>AZS 777-2014, Fire test for quarter-turn valves and valves equipped with nonmetallic seats</i> | API 607-2010, Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats |
| <i>AZS 778-2014, Metal Ball Valves—Flanged, Threaded, and Welding Ends</i> | API 608-2012, Metal Ball Valves—Flanged, Threaded, and Welding Ends |
| <i>AZS 784-2014, Inspection of pressure-relieving devices</i> | API 576:2009, Inspection of Pressure-Relieving devices |
| <i>AZS 785-2014, Valve Inspection and Testing</i> | API 598:2009, Valve Inspection and Testing |
| <i>AZS 786-2014, Steel Gate Valves - Flanged and Butt-welding Ends, Bolted Bonnets</i> | API 600:2009, Steel Gate Valves—Flanged and Butt-welding Ends, Bolted Bonnets |
| <i>AZS 787-2014, Corrosion-resistant, Bolted Bonnet Gate Valves - Flanged and Butt-welding Ends</i> | API 603:2013, Corrosion-resistant, Bolted Bonnet Gate Valves—Flanged and Butt-welding Ends |
| <i>AZS 788-2014, Machinery Protection Systems</i> | API 670:2000, Machinery Protection Systems |
| <i>AZS 789-2014, Manual of Petroleum Measurement Standards: Metering</i> | API MPMS Chapter 5.2 |
| <i>AZS 790-2014, Specification for Fire Test for Valves</i> | API 6FA: 2011, Specification for Fire Test for Valves |
| <i>AZS 791-2014, Specification for Fire Test for Valve with Automatic Backseats</i> | API 6FC:2009, Specification for Fire Test for Valve with Automatic Backseats |
| <i>AZS 800-2014, Design and Construction of Large, Welded, Low Pressure Storage Tanks</i> | API STD 620:2013, Design and Construction of Large, Welded, Low-Pressure Storage Tanks |
| <i>AZS 803-2014, General Purpose Steam Turbines for Petroleum</i> | API STD 611:1997, General-purpose Steam Turbines for Petroleum, Chemical, and Gas Industry Services |

| AZS Standard | API Standards Referenced |
|--|--|
| <i>AZS 818-2015, Management of Hazards Associated with Location of Process Plant Permanent Buildings</i> | API RP 752:2009, Management of Hazards Associated with Location of Process Plant Permanent Buildings |
| <i>AZS 819-2015, Butterfly Valves: Double Flanged, Lug and Wafer Types</i> | API STD 609:1997, Butterfly Valves: Double-flanged, Lug- and Wafer-type, and Butt-welding Ends |
| <i>AZS 826-2015, Special Purposed Gear Units for Petroleum, Chemical and Gas Industry Services</i> | API 613:2005, Special-purpose Gears for Petroleum, Chemical, and Gas Industry Services |
| <i>AZS 827-2015, General Purpose Gear Units for Petroleum, Chemical and Gas Industry Services</i> | API 677:2005, General-purpose, Extruder, and Epicyclic Gear Units for Petroleum, Chemical, and Gas Industry Services |

EGYPT

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

Egypt's **Ministry of Petroleum and Natural Resources** sets overall policies for natural gas and oil sector; however, the Egyptian government also shapes policy in the sector through its participation via five national state-owned companies:

- the **Egyptian General Petroleum Corporation (EGPC)**, (established by Laws No. 135/1956, No. 167/1958, and No. 20/1976), which conducts crude oil exploration, storage, transport, and refining
- the **Egyptian Natural Gas Holding Company (EGAS)** (established by Prime Ministerial Decree No. 1009/2001), which issues natural gas exploration licenses and manages government stakes in gas projects
- the **Egyptian Petrochemicals Holding Company**, which manages government ownership interests and investments in petrochemicals
- the **Ganoub El-Wadi Petroleum Holding Company (GANOPE)** (established by Prime Ministerial Decree No. 1580/2003), which manages oil exploration and production areas below 28° latitude
- and the **Egyptian Mineral Resources Authority (EMRA)**, which can grant concessions for certain blocks of subsoil oil reserves.

Along with Law No. 66/1953 which established the predecessor to EGPC, and the accompanying Ministerial Decree No. 758/1972, which sets out further implementing regulations, the above laws and the entities provide a legal framework for natural gas and oil policy. For downstream gas operations, the **Gas Regulatory Authority (GRA)** – established by Gas Market Activities Law No. 196/201 and the accompanying Prime Ministerial Decree No. 239/2018 – oversees the transmission, supply, and distribution of natural gas.

The national standards body is the **Egyptian Organization for Standardization and Quality (EOS)**, which has issued over 10,000 national standards covering all industrial sectors, including natural gas and oil. Ministerial Decrees No. 180/1996 and No. 291/2003 require use of Egyptian national standards where available. Where such standards do not apply, the decrees permits the use of international standards, including API, ISO, IEC, EN, ANSI, JIS, and ASTM standards.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

The Egyptian natural gas and oil companies use a mix of international standards and national standards, including Egyptian standards modeled on European or British standards. EOS has partnered with the EU and the standards associations of its member states, including Association Française de Normalisation (AFNOR, the French standards body), the British Standards Institute (BSI, the UK standards body), and the Spanish Association for Standardization and Certification (AENOR, the Spanish standards body) on the development of standards.

On natural gas and oil, EOS has issued at least two national standards that refer to API standards:

- *EOS 1735, Determination of Cold Filter Plugging Point for Distillate Fuel (Gas Oil and Diesel Oil)*
- *EOS 80, Test Method for Density, Relative Density or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method (refers to API MPMS).*

Others relevant to offshore equipment are modeled on ISO standards, including:

- *EOS 3237, Petroleum and Natural Gas Industries - Drilling and Production Equipment - Inspection, Maintenance, Repair and Remanufacture of Hoisting Equipment, which is modeled on ISO 13534.*

Many other EOS standards, particularly those relevant to test methods for petroleum products, refer to ASTM standards or ISO standards, including:

- *EOS 1285, Test Method for Gage Vapor Pressure of Liquefied Petroleum (LP) Gases, which refers to ASTM D 1267.*
- *EOS 77, Standard Test Method for Distillation of Petroleum Products, which refers to ASTM D 86 and ISO 3405.*

IRAQ

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The **Ministry of Oil** in Iraq is the federal government agency responsible for managing Iraq's oil and gas resources, as well as exploration and production activities. The Ministry manages hydrocarbon resources through its five state-owned oil and gas companies: the **middle/Midland Oil Company**, the **North Oil Company (NOC)**, the **Dhi Qar Oil Company**, the **Basrah Oil Company (BOC)**, and the **Missan Oil Company (MOC)**. These national oil and gas companies sign contracts with the private sector for participation in Iraq's oil and gas market. Iraq's **Ministry of the Environment** also has a role in regulating oil and gas activities from a climate and environmental policy perspective.

Iraq's Constitution currently sets the legal framework for oil and gas law. Although the Constitution requires the legislature to pass a national oil and gas law, it has not yet done so. Oil and gas upstream operations are governed by the service contracts between private sector participants and the relevant national oil company. For downstream operations, the Law of Private Investment in Crude Oil Refining governs private sector investment and management of refining and marketing.

Separately from Iraq's federal regulation of oil and gas, the Kurdistan Regional Government (KRG), an autonomous state within Iraq, has typically administered its own oil and gas resources under the KRG Oil and Gas Law of 2007. However its authority is a source of political and legal dispute with the federal Iraqi government. In February 2022, the Iraqi Federal Supreme Court declared the KRG Oil and Gas Law unconstitutional and ruled against KRG's legal authority to manage oil resources. The KRG has continued to dispute the ruling.

Within the federal Ministry of Planning, the **Central Organization of Standardization and Quality Control (COSQC)** is the national standards development and management body.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

While Iraq does not publish a list of applicable standards for the oil and gas sector, the Ministry of Oil has issued the *National Code for Hydrocarbon Measurements (2007)*, which sets the measurement systems that are applicable to fiscal/custody transfer measurements in contracts with the Ministry of Oil.

The National Code states that fiscal/custody transfer measurements "shall be in accordance with applicable published standards such as API and ISO." It makes specific reference to one API standard and five chapters of the *Manual for the Measurement of Petroleum Standards*:

- API 2540, Standard Petroleum Measurement Tables
- Chapter 1, Vocabulary
- Chapter 2, Tank Calibration
- Chapter 3, Tank Gauging
- Chapter 14, Natural Gas Fluids Measurement
- Chapter 21, Flow Measurement

SPECIAL NOTE: GULF COOPERATION COUNCIL

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The Gulf Cooperation Council (GCC) is a regional intergovernmental organization consisting of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates. While oil and gas is regulated at the national level within the GCC, the GCC Standardization Organization (GSO) develops and issues some region-wide technical standards, including some for the oil and gas sector.

Most GCC members are formally represented at the GSO by their national-level standards setting organizations, though other relevant stakeholders (such as national oil companies) contribute to the development of standards for the oil and gas sector. Kuwait, as a special case, is represented by both its national standards body and the Kuwait Oil Company at the GSO.

For the oil and gas sector, GSO has issued over 1,000 standards and 12 technical regulations. While standards are voluntary GSO technical regulations are mandatory unless the national laws and regulations of the GCC member specify otherwise. The 12 mandatory technical regulations include:

- *GSO 1785:2013, Lubricating Oils for Internal Combustion Engines API Classifications*
- *GSO 558:2003, Transportable Gas Cylinders – Dissolved Acetylene Cylinders – Basic Requirements*
- *GSO 1182:2002, Determination of Acid Number of Petroleum Products by Potentiometric Titration*
- *GSO 1075:2002, Determination of Acid and Base Number in Petroleum Products by Colour — Indicator Titration*
- *GSO 882:1997, Petroleum Products and Hydrocarbon Solvents – Determination of Aniline Point and Mixed Aniline Point*
- *GSO ISO 5661:1994, Petroleum Products -- Hydrocarbon Liquids -- Determination of Refractive Index*
- *GSO 472:1994, Personnel Requirements for Professions of Liquefied Gas Distribution, Gas Appliances Installation and Maintenance*
- *GSO 129:1990, Methods of Testing for Crude Petroleum and Petroleum Products – Determination of Ash From Petroleum Products*
- *GSO 127:1990, Methods of Testing for Crude Petroleum and Petroleum Products – Determination of Density, Relative Density and API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method*
- *GSO 74:1987, Industrial Safety and Health Regulations - Petroleum Industry*

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

In March 2019, API signed an MOU with the GCC Standardization Organization to pursue adoption of API standards and build capacity and knowledge, and collaborate on standards development.

The [catalogue](#) of GCC standards does not specify the normative references to other international standards. As evidenced by their title code, some standards are modeled on ISO standards or ASTM standards, including:

- *GSO ISO 11960:2014, Steel Pipes for Use as Casing or Pipes for Wells*
- *GSO ASTM D1250:2015, Guidelines for the Use of Petroleum Measurement Tables*
- *GSO ISO 23251:2008, Pressure Relief and Venting Systems*
- *GSO ISO 15589-1, 2016, Cathodic Protection of Pipeline Systems, Part 1: Above Ground Pipelines*

As of June 2022 the GCC Standardization Organization's standards database lists a single API-based standard, *GSO API RP 615:2015, Valve Selection Guide*.

BAHRAIN

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The oil and gas sector in Bahrain is regulated by the **National Oil & Gas Authority (NOGA)**. In addition to its regulatory duties, NOGA signs development and sharing agreements with oil and gas companies through its investment arm, **Nogaholding**. NOGA has agreements with both the state-owned **Bahrain Petroleum Company** and a number of joint ventures with foreign companies for both upstream and downstream projects. The **Supreme Council for the Environment** is the highest environmental policymaking body in Bahrain and may also play a role in regulating oil and gas projects in some cases.

Bahrain does not have an overarching framework for oil and gas regulation. Instead, NOGA's regulations, its production and sharing agreements (which are negotiated on a case by case basis), and other agreements it reaches with private sector partners govern how companies can participate in Bahrain's oil and gas sector. The agreements generally require parties to comply with international standards for quality as well as health, safety and the environment.

Bahrain also has a national standards development organization (the **Bahrain Standards & Metrology Directorate or BSMD** within the **Ministry of Industry, Commerce, and Tourism**) but it does not have an active role in standards development the oil and gas sector.

Bahrain is also a member of the Gulf Cooperation Council (GCC), together with Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates. The GCC has a regional standards development organization, the **GCC Standardization Organization**, which develops region-wide standards (see special note on Gulf Cooperation Council). Bahrain is formally represented at the GCC standardization Organization by BSMD.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

NOGA does not make public a comprehensive list of the standards required for its suppliers and contractors. In many cases, it requires compliance with API or other international standards through its agreements with contractors and vendors. **In general, Bahrain and NOGA have widely adopted API standards and broadly accept and/or require adherence with them from its contractors and suppliers.**

KUWAIT

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The oil and gas industry in Kuwait is regulated at the highest level by the **Supreme Petroleum Council**, as well as by the **Ministry of Oil**. The Ministry of Oil also governs the **Kuwait Petroleum Corporation (KPC)**, the state-owned oil company. The **Environment Public Authority** is the environmental regulator and also plays a role in assessing oil and gas projects.

Kuwait prohibits private sector investment in upstream oil and gas activities. Partnership with the state-owned KPC is required for both the upstream sector as well as major downstream activities as well. KPC's subsidiaries include the **Kuwait Oil Company (KOC)** for the upstream sector, the **Kuwait National Petroleum Company (KNPC)** for the downstream sector, and the **Petrochemical Industries Company (PIC)** for the petrochemical sector.

Requiring conformance with international standards or standards generally is required by laws and regulations. The chief regulatory measure governing oil and gas activities, the *Regulations for the Conservation of Petroleum Resources*, implementing *Law No. 19 of the Year 1973 Concerning the Conservation of Petroleum Resources*, require that:

- "Petroleum operations must be carried out in the best manner using *efficient and reasonable methods and good techniques* as would be expected from a person fully experienced in such operations under similar circumstances and conditions" (Article 3)
- "All machinery equipment, and materials used in petroleum operations *must conform to recognized internationally acceptable specifications, meet safety requirements, and serve their purpose in accordance with the best techniques and practices.*" (Article 4)

In addition, KPC can also mandate the use of standards through their contracts and agreements with private sector participants.

Kuwait's national standards development organization, **Standards and Industrial Services Affairs (KOWSMD)**, within the Public Authority for Industry (PAI) issues, develops, and approves standards in all industrial sectors, but is less relevant to standards for the oil and gas sector.

Kuwait is also a member of the Gulf Cooperation Council (GCC), which also includes Oman, Bahrain, Kuwait, United Arab Emirates, and Qatar. The GCC has a regional standards development organization, the **GCC Standardization Organization**, which develops region-wide standards. Kuwait is represented at the GCC Standardization Organization by KOWSMD and by KOC for the oil and gas sector.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Neither KPC nor the Ministry of Oil makes public a comprehensive list of standards for the oil and gas sector. KPC mandates use of certain standards for their suppliers and contractors. **In general, KPC has widely adopted API standards and broadly accepts and/or requires adherence with them from its contractors and suppliers.** KPC uses primarily API standards in their request for proposals.

Within KPC, the upstream subsidiary KOC has an internal Standards Team responsible for developing and issuing in-house standards related to the oil and gas sector. KOC has developed over 170 standards and continually reviews and updates them.

KOC-issued standards may be based on API standards or their equivalent ISO or other standards, and will also reference specific international standards. While KOC does not publish its standards nor a list of international standards referenced by its standards, five KOC-issued standards were identified that reference 6 API standards. These include:

- KOC-MV-008, *Air-Cooled Heat Exchangers* is adopted from *API 661, Air-Cooled Heat Exchangers for General Refinery Service*
- KOC-MP-010, *Ball Valves*, references *API 6D, Specification for Pipeline Valves*
- KOC-MS-002, *Material Specification for Induction Bends*, references *API Q1, Specification for Quality Programs for the Petroleum, Petrochemical and Natural Gas Industries*, and *API 5L, Specification for Line Pipe, Steel Pipe for Pipeline Transportation Systems*
- KOC-L-009, *Fire Protection Systems and Safety Equipment*, references *API RP 581, Risk Based Inspection Technology*
- KOC-C-007, *Structural Steel Work – Materials, Fabrication, and Erection*, references *API 5L, Specification for Line Pipe*

QATAR

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The **Ministry of Energy Affairs** is the primary regulator for oil and gas for production, operations and distribution. The state-owned **Qatar Petroleum (QP)** is the dominant company in both upstream and downstream operations, and the Chairman of QP concurrently serves as the Minister of Energy. By law, QP has exclusive concession rights for upstream activities. The **Ministry of Environment** is the environmental regulator for Qatar and plays a role in assessing oil and gas projects.

Conformance with international oil and gas standards is required by law in Qatar. Article 3 of the *Decree Law No. 4 of 1977 on Preserving Petroleum Resources* states:

Taking into consideration the measures required for safety precautions and production regulation, oil operations and related projects shall be conducted *according to the prevailing technical traditions, rules and standards in the oil industry* which guarantee the best practices for the optimal exploitation, investment, preservation, development and production of the State's oil resources, as well as the prevention of their loss, damage or waste.

In addition, QP mandates the use of standards through their contracts and agreements with private sector suppliers. QP also issues standards and technical requirements, some of which are based on or reference international standards. It has also mandated compliance with standards as part of the [Health, Safety and Environment \(HSE\) Regulations for Contractors](#) (QP-REG-S-001). Qatar's national standards development organization, the Qatar General Organization for Standardization (QS), plays less of a role in the oil and gas sector.

Qatar is also a member of the Gulf Cooperation Council (GCC), together with Bahrain, Kuwait, Oman, Saudi Arabia, and United Arab Emirates. The GCC has a regional standards development organization, the **GCC Standardization Organization**, which develops region-wide standards (see special note on Gulf Cooperation Council). Qatar is formally represented at the GCC standardization Organization by QS.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Neither QP nor the Ministry of Energy makes public a comprehensive list of standards for the oil and gas sector. **In general, QP has widely adopted API standards and broadly accepts and/or requires adherence with them from its contractors and suppliers.**

Qatar's HSE Regulations for Contractors directly refer to 8 API standards for drilling equipment by name:

- *API Spec. 4A, Derricks and Masts*
- *API Spec. 5A, Casing, Tubing, and Drill Pipe*
- *API Spec. 5B, Threading, Gauging and Thread Inspection*
- *API Spec. 6A, Wellhead Equipment*
- *API Spec. 7, Rotary Drilling Equipment*
- *API Std. 8A, Drilling Hoisting Equipment*
- *API Spec. 9B, Wire Rope*
- *API RP 520, Pressure Relief Systems*

In a few other areas, the HSE Regulations for Contractors prescribe meeting API standards without referring to specific standards by name. These include API standards and requirements for:

- Recommended soil parameters for use in reclamation and restoration
- Limits for land on onshore facilities to be considered as contaminated
- Metal guidance on maximum soil concentrations
- Classification of hazardous zones

OMAN

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The **Ministry of Oil and Gas (MOG)** is the primary regulator for oil and gas activities in Oman for all upstream and downstream activities. As oil and gas reserves are owned by the state, MOG is the government counterparty to exploration and production sharing agreements with the private sector for upstream activities. It also grants licenses for downstream activities. As the chief environmental regulator, the **Ministry of the Environment and Climate Affairs** also plays a role in assessing the environmental impacts of oil and gas projects.

The main legislation governing oil and gas in Oman is Sultani Decree 8/2011, the Oil and Gas Law. Article 40 requires that parties to oil and gas agreements use “materials and equipment that are in conformity with international standards and specifications” and they should “meet the requirements of safety and environment according to the best methods in this regard.”

Petroleum Development Oman (PDO), MOG’s joint venture with Royal Dutch Shell, Total, and Partex, is the largest upstream participant in Oman and requires its suppliers and contractors to comply with technical standards. For downstream activities, the state-owned **Oman Oil Refineries and Petroleum Industries Company (ORPIC)** is the primary operator. As MOG has not issued regulations mandating or recommending use of specific technical standards for the oil and gas industry, PDO, ORPIC and other industry participants play a major role in determining which standards are used.

Oman’s national standards development organization is the **Directorate General for Specifications and Measurements (DGSM)** within the Ministry of Commerce and Industry. DGSM is not active in issuing standards for the oil and gas sector.

Oman is also a member of the Gulf Cooperation Council (GCC), together with Bahrain, Kuwait, Qatar, Saudi Arabia, and UAE. The GCC has a regional standards development organization, the **GCC Standardization Organization**, which develops region-wide standards (see special note on Gulf Cooperation Council). Oman is formally represented at the GCC standardization Organization by DGSM.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Unlike the rest of the GCC, there is a general preference in Oman for use of British standards (EN), though API standards have increasingly gained widespread acceptance.

PDO has issued a [Guide to Engineering Standards and Procedures](#) which references 13 API standards for mechanical rotating equipment, materials selection and corrosion engineering, and pipeline and flowline engineering. These are:

| | |
|---|--|
| Mechanical rotating equipment | <p><i>API 673, Centrifugal Fans for Petroleum, Chemical, and Gas Industry Services</i></p> <p><i>API 674, Positive Displacement Pumps – Reciprocating</i></p> <p><i>API 675, Positive Displacement Pumps – Controlled Volume</i></p> <p><i>API 676, Positive Displacement Pumps – Rotary</i></p> <p><i>API 616, Gas Turbines for Petroleum, Chemical, and Gas Industry Services</i></p> <p><i>API 617, Axial and Centrifugal Compressors and Expander-Compressors</i></p> <p><i>API 619, Rotary-Type Positive-Displacement Compressors</i></p> |
| Materials Selection and Corrosion Engineering | <p><i>API SPEC 6A, Nickel Base Alloy 718</i></p> <p><i>API RP 5L7, Recommended Practice for Unprimed Internal Fusion Bonded Epoxy Coating of Line Pipe</i></p> <p><i>API SPEC 5LD, CRA Clad or Lined Steel Pipe</i></p> <p><i>API 1104, Welding Pipelines and Related Facilities</i></p> <p><i>API RP 582, Welding Guidelines for the Chemical, Oil, and Gas Industries</i></p> |
| Pipeline and Flowline Engineering | <p><i>API-5LC, CRA Line Pipe</i></p> |

SAUDI ARABIA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

Since foreign investment in upstream oil and gas activity is prohibited in Saudi Arabia, participation in Saudi Arabia's oil and gas sector generally occurs through the state-owned **Saudi Arabian Oil Company (Saudi Aramco)**. In downstream sectors, foreign companies still frequently partner with Saudi Aramco through joint ventures or other arrangements. Because of this, the **Supreme Council of Saudi Aramco**, chaired by Crown Prince Mohammed bin Salman, is the highest-level decision making body for the oil and gas sector in Saudi Arabia. Saudi Aramco sets standards for the industry by requiring compliance from its suppliers and contractors.

In July 2018, Saudi Arabia formed the **Higher Committee for Hydrocarbons**, also led by bin Salman, which is nominally responsible for overseeing all oil and gas sector activities. The committee includes the ministers of energy, trade, finance, and economy. The **General Authority for Meteorology and Environmental Protection** oversees environmental regulation and also plays a role in policymaking for the oil and gas sector.

Though it has been separated from governance of Saudi Aramco since 2015, Saudi Arabia's **Ministry of Energy, Industry and Mineral Resources** has some legal authority for policymaking in the oil and gas sector, particularly for downstream activities.

Saudi Aramco issues its own standards, which include Saudi Aramco Engineering Standards (SAES), Saudi Aramco Materials System Specifications (SAMSS), and Saudi Aramco Standard Drawings (SASDs). Saudi Aramco in many cases also mandates compliance with API and other international standards directly.

Saudi Arabia's national standards development organization, the **Saudi Standards, Metrology, and Quality Organization (SASO)**, has not historically been involved in standards setting for the oil and gas sector. However, SASO signed a technical collaboration agreement with Saudi Aramco in January 2017 to share information and collaborate in developing and managing engineering standards.

Saudi Arabia is also a member of the Gulf Cooperation Council (GCC), together with Bahrain, Kuwait, Oman, Qatar, and United Arab Emirates. The GCC has a regional standards development organization, the **GCC Standardization Organization**, which develops region-wide standards (see special note on Gulf Cooperation Council). Saudi Arabia is represented at the GCC Standardization Organization by SASO.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Saudi Aramco does not make public a comprehensive list of the standards required for its suppliers and contractors. **However, Saudi Aramco has widely adopted API standards and broadly accepts and/or requires adherence with them from its contractors and suppliers.**

The safety manual intended for suppliers, entitled "[Saudi Aramco Suppliers Safety Management System](#)," requires compliance with "all applicable regulatory requirements and standards," but does not list any standards by name.

Saudi Aramco has also published a handbook entitled, [Engineering Requirements for Technical and Quality Approval](#), to provide guidelines to manufacturers of engineering equipment used by Saudi Aramco. The handbook cites to 11 API standards directly:

- *API Spec Q1, Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry*
- *API Spec 5LD, CRA Clad or Lined Steel Pipe*
- *API Recommended Practice 15S, Qualification of Spoolable Reinforced Plastic Line Pipe*
- *API Spec 17J, Unbonded Flexible Pipe*
- *API Recommended Practice 17B, Recommended Practice for Flexible Pipe*
- *API 660, Shell-and-Tube Heat Exchangers*
- *API 661, Petroleum, Petrochemical, and Natural Gas Industries Air-Cooled Heat Exchangers*
- *API 560, Fired Heaters for General Refinery Service*
- *API 530, Calculation of Heater-tube Thickness in Petroleum*
- *API SPEC 2C, Offshore Pedestal-mounted Cranes*
- *API SPEC 9A, Wire Rope*

UNITED ARAB EMIRATES (UAE)

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

Oil and gas regulation in the United Arab Emirates (UAE) is conducted primarily by each of the seven individual Emirates. The federal **Ministry of Energy and Industry** issues some regulations (particularly related to trade in oil and gas) but does not control exploration and production rights. Most regulatory activity for the sector takes place in the Emirate of Abu Dhabi, which controls over 94 percent of total UAE oil and gas reserves.

The federal **Ministry of Climate Change and the Environment** and the environmental regulators within each Emirate also play a role in environmental assessments of oil and gas projects.

In Abu Dhabi, the **Abu Dhabi Supreme Petroleum Council (SPC)**, is the highest supervisory body for oil and gas companies operating. Its policies are generally carried out by the **Abu Dhabi National Oil Company (ADNOC)**, whose board of directors is made up of SPC members. Because the private sector must generally partner with ADNOC in order to participate in Abu Dhabi's oil and gas sector, ADNOC serves as the de facto regulator, requiring conformance with technical standards for its suppliers and contractors.

Abu Dhabi's principle legislation governing oil and gas reserves, Law No. 8 of 1978 regarding the Conservation of Petroleum Resources, requires that industry use the "most efficient techniques" and the use of machinery and materials conforming to international standards on safety and efficiency.

The national standards development organization, the **Emirates Authority for Standardization and Metrology (ESMA)**, does not play an active role in standards development for oil and gas.

UAE is also a member of the Gulf Cooperation Council (GCC), together with Bahrain, Kuwait, Oman, Qatar, and Saudi Arabia. The GCC has a regional standards development organization, the **GCC Standardization Organization**, which develops region-wide standards (see special note on Gulf Cooperation Council). UAE is formally represented at the GCC standardization Organization by ESMA.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

ADNOC has not made public a comprehensive list of standards for the oil and gas sector. It requires that its contractor and suppliers comply with mandatory "Codes of Practice" to manage health, safety and environment concerns, and also publishes "Codes of Practice Guidelines," and "Codes of Practice Best Practice Notes," which are recommended but not mandatory.

In these Guidelines, ADNOC has widely adopted API standards and broadly accepts and/or requires adherence with them from its contractors and suppliers.



INDO-PACIFIC

AUSTRALIA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

Regulation of the natural gas and oil sector in Australia occurs at Federal, State/Territory and local council levels. Federal laws affect petroleum activities in all States, including those relating environmental protection and offshore operations. The key federal legislation for upstream activities is the *Offshore Petroleum and Greenhouse Gas Storage Act (2006)*, which provides a framework for all offshore petroleum exploration. States and territories have jurisdiction to govern onshore exploration and production, and do so through a variety of state legislative acts. Western Australia (WA), which makes the largest contribution to the country's hydrocarbon production, is regulated by the WA Department of Mines, Industry Regulation and Safety (DMIRS).

The National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) is Australia's independent expert regulator for health and safety, structural well integrity and environmental management for all offshore operations and greenhouse gas storage activities. Exploration activities must be approved by a joint authority that includes the Federal Ministry for Resources along with relevant state/territory ministers, as well as NOPSEMA. In addition to assessing and approving exploration activities, NOPSEMA provides continual oversight of environmental and safety impacts and issues performance data, policy and guidance material, and reports.

The Australian standards organization is Standards Australia (SAI), an independent, non-profit recognized through a memorandum of understanding with the Australian government as the country's national standards body. SAI has issued over 6,000 standards, including for the natural gas and oil sector. Through the Accreditation Board for Standards Development Organizations (ABSDO), other standards development organizations can be accredited to develop Australian standards.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Standards Australia has stated its support for the development and adoption of international standards, and the standards developed by the organizations are in some cases adoptions of international standards. However, the organization's [Standards Catalogue](#) does not publicly state whether or not individual standards reference API.

NOPSEMA, for its part, issues policy and guidance material for the hydrocarbon sector relating to safety, well integrity, and environment. Among this guidance are four references to API standards.

| Guidance | API Standard Referenced |
|--|---|
| Guidance note: Control Measures and Performance Standards | <i>API 520: Sizing, Selection, and Installation of Pressure-relieving Devices</i> <i>API 607: Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats</i> |
| Guidance note: Well operations management plan content and level of detail | <i>API Bulletin 97, Well Construction Interface Document Guidelines</i> |
| Guidance note: Hazard identification and risk assessment | <i>API Bulletin 97, Well Construction Interface Document Guidelines</i> |

CHINA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

Three government agencies in China have principal oversight over the development of standards affecting the oil and gas sector:

- **Standardization Administration of China (SAC)** under the **State Administration for Market Regulation (SAMR)**: SAC in China is the principal agency responsible for developing all technical standards for products and services. The China National Institute of Standardization (CNIS) acts as the research institute or “think tank” for SAC.
- **National Energy Administration (NEA), National Development and Reform Commission (NDRC)**: NEA is responsible for developing certain standards specific to the oil and gas sector.
- **Ministry of Industry and Information Technology (MIIT)**: MIIT is responsible for developing certain communications- and technology-related standards. The China Electronics Standardization Institute (CESI) under MIIT is a research institute that assists in developing standards.

All three agencies develop and/or issue standards with which oil and gas companies operating in China, both upstream and downstream, must comply. Additionally, several other Chinese agencies play a role in regulating the oil and gas sector and may rely on relevant standards issued by SAC, NEA, or MIIT:

- **State Council**: As the chief executive authority of the Chinese government, the State council plays a direct role in approving major oil and gas pipeline projects.
- **Ministry of Natural Resources (MNR)**: MNR grants exploration and/ or exploitation licenses for oil and gas resources on behalf of the state.
- **Ministry of Ecology and the Environment (MEE)**: MEE regulates environmental impacts of oil and gas exploration, production, refining, and processing.
- **Ministry of Emergency Management (MEM)**: MEM regulates worker safety policies for the oil and gas sector, among others.

China recently began a process of streamlining its standards development to better incorporate global standards, reduce complexity, increase accountability, and enhance transparency. Its current standards framework is set by the Revised Chinese Standardization Law (“Revised Law”), which entered into force on January 1, 2018. Under the Revised Law, there are currently four notable categories of standards:

- **Mandatory national standards**, developed by national standards-setting agencies, with which all products and services must comply
- **Voluntary national standards**, developed by national standards-setting agencies, which are recommended but not required
- **Voluntary association standards**, which are developed by industry associations and other standards-setting social organizations (the China Association for Standardization (CAS) is one such public association affiliated with the State Administration of Market Regulation or SAMR)
- **Voluntary enterprise standards**, which are developed by companies for their own use

Foreign companies are required to partner with Chinese state-owned oil and gas companies, in order to participate in relevant projects. State-owned companies include the **China National Petroleum Corporation (CNPC)**, the **China Petrochemical Corporation (SINOPEC)**, the **China National Offshore Oil Corporation (CNOOC)**, and the newly established China Oil and Gas Pipeline Network Corporation (PIPECHINA), which took over responsibility for managing

the majority of China's pipeline system Chinese national oil and gas companies also participate in standards development for the operations they are involved in.

Chinese oil and gas regulations typically do not refer to specific national Chinese standards or other international standards. Instead, environmental, worker safety, and energy laws and regulations require general compliance with all applicable standards. For example:

- **Article 17, Detailed Rules for the Administration of Offshore Oil Safety (2015):** During the operation of offshore oil production, operators and contractors shall ensure that the safety conditions of the offshore oil production and operating facilities (hereinafter referred to as "facilities") comply with the provisions of laws, administrative regulations, and rules and requirements of *relevant national and industrial standards*.
- **Article 34, Revised Environmental Protection Law (2014):** The discharge of pollutants and the dumping of wastes into the seas, and the construction of coastal projects and marine projects shall be conducted in compliance with provisions of laws and regulations *and relevant standards*, so as to guard against and reduce the pollution and damage of the marine environment.
- **Article 16, Revised Work Safety Law (2014):** Production and business units shall have the conditions for work safety as specified by the provisions in this Law and relevant laws, administrative regulations *and national standards or industrial specifications*.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

All national Chinese standards (whether mandatory or voluntary) are issued and developed by SAC or the relevant Chinese agency. Many are coded as *guobiao* or GB standards, with national recommended standards being coded as GB/T standards. Other relevant standards may be coded as SY (petroleum gas), SH (petrochemicals), HG (chemicals), and TSG (special equipment).

In the oil and gas sector a large number of standards are voluntary, though Chinese state-owned oil companies may require suppliers and partners to comply with them. These standards are most commonly adopted from or equivalent to ISO standards and are broadly used for both upstream and downstream activities, including drilling equipment, control systems, and pipelines, as well as for various measurements and methods. Examples include:

- GB/T 21412.6-2018, *Design and Operation of Subsea Production Systems—Part 6: Subsea Production Control Systems* (ISO 13628-6:2006)
- GB/T 16783.1-2014, *Field Testing of Drilling Fluids—Part 1: Water-based Fluids* (ISO 10414-1:2008)
- GB/T 498-2014, *Classification Methods and Categories of Petroleum Products and Lubricants* (ISO 8681:1986.)
- GB/T 30217.2-2016, *Drilling and Production equipment—Part 2: Deepwater Drilling Riser Analysis Methodologies, Operations and Integrity* (ISO/TR 13624-2:2009)
- GB/T 9711-2017, *Steel Pipe for Oil and Gas Industry Pipeline Transportation System* (ISO 3183:2012)

In others cases national standards are adopted from or equivalent to ASTM, API, and GOST (Russia) standards. According to SAC's catalogue of national standards, 11 GB/T standards model API standards, and are used particularly for submersible electrical pumps and related equipment, as well as for some drilling activities:

| National Chinese Standard | API Standard Referenced |
|--|--|
| <i>GB/T 17389-2013, Recommended Practice for the Application of Submersible Electric Pump Cable System</i> | <i>API RP 11S5, Recommended Practice for the Application of Electrical Submersible Cable Systems</i> |
| <i>GB/T 19190-2013, Petroleum and Natural Gas Industries Drilling and Production Hoisting Equipment</i> | <i>API SPEC 8C, Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)</i> |
| <i>GB/T 29172-2012, Practices for Core Analysis</i> | <i>API RP 40, Recommended Practices for Core Analysis</i> |
| <i>GB/T 17390-2010, Recommended Practice for Submersible Electrical Pump Teardown Report</i> | <i>API RP 11S1, Recommended Practice for Electrical Submersible Pump Teardown</i> |
| <i>GB/T 17388-2010, Installation of Submersible Electric Pumps</i> | <i>API RP 11S3, Recommended Practice for Electrical Submersible Pump Installations</i> |
| <i>GB/T 25430-2010, Specification for Drill Through Equipment - Rotating Control Devices</i> | <i>API SPEC 16RCD, Drill Through Equipment-Rotating Control Devices</i> |
| <i>GB/T 24956-2010, Recommended Practice for Petroleum and Natural Gas Industries — Drill Stem Design and Operating Limits</i> | <i>API RP 7G, Recommended Practice for Drill Stem Design and Operating Limits</i> |
| <i>GB/T 17386-2009, Sizing and Selection of Electric Submersible Pump Installations</i> | <i>API RP 11S4, Recommended Practice for Sizing and Selection of Electric Submersible Pump Installations</i> |
| <i>GB/T 19779-2005, Static Measurement of Oil Quantity of Petroleum and Liquid Petroleum Products</i> | <i>API Manual of Petroleum Measurement Standards Chapter 12—Calculation of Petroleum Quantities</i> |
| <i>GB/T 18050-2000, Test Method for Submersible Electric Pump Cables</i> | <i>API RP 11S6, Recommended Practice for Testing of Electric Submersible Pump Cable Systems</i> |
| <i>GB/T 18051-2000, Test Method for Vibration of Submersible Electric Pumps</i> | <i>API RP 11S8, Recommended Practice on Electric Submersible System Vibrations</i> |

INDIA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The **Ministry of Petroleum and Natural Gas** is the primary regulator for the exploration and extraction of oil and gas, while the **Petroleum and Natural Gas Regulatory Board** regulates refining, processing, storage, transportation, distribution, marketing, and sale. Both agencies utilize and make reference to complying with technical standards in their rules and regulations. The **Ministry of Environment, Forest and Climate Change** assesses environmental impacts of oil and gas projects and also play a role in policymaking for the oil and gas sector.

Standards for India's oil and gas sector are issued by the **Oil Industry Safety Directorate (OISD)** within the Ministry of Petroleum and Natural Gas. India's national standards development organization, the **Bureau of Indian Standards (BIS)** within the **Ministry of Consumer Affairs**, has also developed standards for the oil and gas sector and represents India within the ISO and other international bodies.

OISD has issued over 120 standards (SDN), recommended practices (RP), and guidelines (GDN) related to oil and gas, while BIS has issued over 140 standards (IS) relevant to the sector. These standards pertain to all aspects of oil and gas activity, including design and layout of equipment and facilities, operating practices, environmental protection, and worker safety and fire protection. Most are voluntary and recommended. Standards are regularly reviewed and revised to maintain harmony with global standards.

21 standards issued by OISD are cited directly by Indian laws and regulations, namely the Petroleum Rules (2002), Gas Cylinder Rules (2016), Static and Mobile Pressure Vessels (Unfired) Rules (2016), and Oil Mines Regulation (2017). These include:

1. *OISD-STD-105, Work Permit System*
2. *OISD-STD-114, Safe Handling of Hazardous Chemicals*
3. *OISD-STD-116, Fire Protection Facilities for Petroleum Refineries and Oil/Gas Processing Plants*
4. *OISD-STD-117, Fire Protection Facilities for Petroleum Depots, Terminals, Pipeline Installations & Lube Oil Installations*
5. *OISD-STD-118, Layouts for Oil & Gas Installations*
6. *OISD-STD-128, Inspection of Unfired Pressure Vessels*
7. *OISD-STD-129, Inspection of Storage Tanks*
8. *OISD-STD-141, Design & Construction Requirements for Cross Country Hydrocarbon Pipelines*
9. *OISD-STD-156, Fire Protection Facilities for Ports Handling Hydrocarbons*
10. *OISD-STD-144, Liquefied Petroleum Gas (LPG) Installations*
11. *OISD-STD-169, OISD Guidelines on Small LPG Bottling Plants (Design and Fire Protection Facilities)*
12. *OISD-STD-150, Design and Safety Requirements for Liquefied Petroleum Gas Mounded Storage Facility*
13. *OISD-STD-187, Care and Use of Wire Rope*
14. *OISD-STD-189, Standard On Fire Fighting Equipment For Drilling Rigs, Work over Rigs and Production Installations*
15. *OISD-STD-191, Oil Field Explosive Safety*
16. *OISD-STD-226, Natural Gas Transmission Pipelines and City Gas Distribution Networks*
17. *OISD-RP-108, Recommended Practices on Oil Storage and Handling*
18. *OISD-RP-149, Design Aspects for Safety in Electrical Systems*
19. *OISD-RP-174, Well Control*
20. *OISD-GDN-178, Guidelines on Management of Change*
21. *OISD-GDN-182, Safe Practices for Workover and Well Stimulation Operations*

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

API signed an MOU with OISD in March 2014 to provide support in the development of standards. **OISD has widely adopted API standards and broadly accepts and/or requires adherence with them from oil and gas sector participants.** In total, 34 API standards are referenced in the mandatory OISD standards and in guidance from the Ministry of Petroleum and Natural Gas.

The below are the 39 API standards referenced in the mandatory OISD standards:

| OISD Standard | API Standard Referenced |
|--|--|
| <i>OISD-STD-105, Work Permit System</i> | <i>API 2016, Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks</i> <i>API 2015, Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks</i> <i>API Publication 2009, Safe Welding, Cutting, and Other Hot Work Practices in Refineries, Gas Plants, and Petrochemical Plants</i> |
| <i>OISD-STD-116, Fire Protection Facilities for Petroleum Refineries and Oil/Gas Processing Plants</i> | <i>API RP 2001, Fire Protection in Refineries</i> |
| <i>OISD-STD-117, Fire Protection Facilities for Petroleum Depots, Terminals, Pipeline Installations & Lube Oil Installations</i> | <i>API SPEC 15LR, Low Pressure Fiberglass Line Pipe</i> <i>API SPEC 15HR, High-pressure Fiberglass Line Pipe</i> |
| <i>OISD-STD-118, Layouts for Oil & Gas Installations</i> | <i>API Standard 2610: Design, Construction, Operation, Maintenance and Inspection of Terminal and Tank Facilities</i> <i>API Recommended Practices 2001, Fire Protection in Refineries</i> |
| <i>OISD-STD-141, Design & Construction Requirements for Cross Country Hydrocarbon Pipelines</i> | <i>API SPEC 5L, Line Pipe</i> <i>API RP 1102, Steel Pipelines Crossing Railroads and Highways</i> |
| <i>OISD-STD-156, Fire Protection Facilities for Ports Handling Hydrocarbons</i> | <i>API RP 2001, Fire Protection in Refineries</i> |
| <i>OISD-STD-119, Selection, Operation and Maintenance of Pumps</i> | <i>API 610, Centrifugal Pumps for General Refinery Services</i> <i>API 674, Positive Displacement Pump- Reciprocating</i> |
| <i>OISD-STD-144, Liquefied Petroleum Gas (LPG) Installations</i> | <i>API 2510, Design and Construction of LP Gas Installations</i> |

| OISD Standard | API Standard Referenced |
|---|--|
| <p><i>OISD-STD-226, Natural Gas Transmission Pipelines and City Gas Distribution Networks</i></p> | <p><i>API 15LR, Low Pressure Fiberglass Line Pipe and Fittings</i></p> <p><i>API 15HR, High-pressure Fiberglass Line Pipe</i></p> <p><i>API 617, Axial and Centrifugal Compressors and Expander-compressors</i></p> <p><i>API 618, Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services</i></p> <p><i>API 11P, Packaged Reciprocating Compressors for Oil and Gas Production Services</i></p> <p><i>API 1102, Steel Pipelines Crossing Railroads and Highways</i></p> <p><i>API 1104, Welding of Pipelines and Related Facilities</i></p> <p><i>API 1107, Pipeline Maintenance Welding Practices</i></p> <p><i>API 1109, Line Markers and Signage for Hazardous Liquid Pipelines and Facilities</i></p> <p><i>API 1110, Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids, or Carbon Dioxide</i></p> <p><i>API 500C, Classification of Locations for Electrical Installations at Pipeline Transportation Facilities</i></p> <p><i>API 5L, Line Pipe</i></p> <p><i>API 6D, Pipeline Valves</i></p> |
| <p><i>OISD-RP-108, Recommended Practices on Oil Storage and Handling</i></p> | <p><i>API 620, Design and Construction of Large, Welded, Low-Pressure Storage Tanks</i></p> <p><i>API 650, Welded Tanks for Oil Storage</i></p> |
| <p><i>OISD-RP-174, Well Control</i></p> | <p><i>API RP 16E, Design of Control Systems for Drilling Well Control Equipment</i></p> <p><i>API RP 53, Blowout Prevention Equipment Systems for Drilling Wells</i></p> <p><i>API RP 59, Well Control Operations</i></p> <p><i>API RP 64, Diverter Systems Equipment and Operations</i></p> <p><i>API SPEC 16C, Choke and Kill Equipment</i></p> <p><i>API SPEC 16D, Control Systems for Drilling Well Control</i></p> <p><i>API SPEC 16R, Specification for Marine Drilling Riser Couplings</i></p> |

| OISD Standard | API Standard Referenced |
|--|--|
| <i>OISD-RP-GDN-182, Guidelines on Management of Change</i> | <i>API 4G, Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures</i> <i>API 5C1, Care and Use of Casing and Tubing</i> |

Apart from the specific OISD standards, the Ministry of Petroleum and Natural Gas has also issued “[Good International Petroleum Industry Practices](#)” (GIPIP) to provide guidelines for exploration and production of oil and gas. While the guidelines do not supersede applicable laws and regulations and are not legally binding, they are accepted as a reference guide for industry practices.

The GIPIP recommends meeting or exceeding 20 API standards and specifications for a broad swath of exploration and production activities. These include:

| Relevant Field/Practice | API Standard Referenced |
|--|--|
| Well drilling practices and equipment | <i>API RP 53, Recommended Practices for Blowout Prevention Equipment Systems for Drilling Wells</i> <i>API RP 90, Recommended Practices for Blowout Prevention Equipment Systems for Drilling Wells</i> <i>API RP 10B, Recommended Practice for Testing Well Cements</i> <i>API Bulletin D10, Procedure for Selecting Rotary Drilling Equipment</i> <i>API RP 04G, Drilling and Well Servicing Structures</i> <i>API RP 13B, Recommended Practice for Field Testing Water-based Drilling Fluids</i> <i>API RP 54, Occupational Safety and Health for Oil and Gas Well Drilling and Servicing Operations</i> <i>API SPEC 16D, Control Systems for Drilling Well</i> <i>API Bulletin D12A, API Well Number and Standard State and County Numeric Codes Including Offshore Waters</i> |
| Pressure volume temperature (PVT) studies | <i>API RP 44, Sampling Petroleum Reservoir Fluids</i> <i>API Manual of Petroleum Measurement Standards (MPMS)</i> |
| Gas Flaring | <i>API RP 55, Recommended Practice for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide</i> |
| Core studies and analysis | <i>API RP 40, Recommended Practices for Core Analysis</i> |

**Safety Management
and Incident Response**

API RP 14C, Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms

API Technical Report 1145, Guidelines for Offshore Oil Spill Response Plans

API RP 500, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1, and Division 2

API RP 505, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, and Zone 2

API RP 74, Recommended Practice for Occupational Safety for Onshore Oil and Gas Production Operation

API RP 51R, Environmental Protection for Onshore Oil and Gas Production Operations and Leases

API RP 67, Oilfield Explosives Safety

OISD has also issued a “Standard Operating Procedure for Integrity Assessment of Petroleum and Natural Gas Pipelines,” which refers to API RP 1160, Managing System Integrity for Hazardous Liquid Pipelines.

INDONESIA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

In Indonesia, the **Ministry of Energy and Mineral Resources (ESDM)** is the highest level regulator for the oil and gas industry. Within ESDM, **SKK Migas** (Special Task Force for Upstream Oil and Gas Business Activities) negotiates concession agreements and supervises the upstream sector, while **BPH Migas** (Downstream Oil and Gas Regulatory Agency) supervises the downstream sector.

The principal law governing oil and gas activity in Indonesia is the Oil and Gas Law No. 22/2001. Article 40 requires participating business entities to “guarantee the effective standard and quality in accordance with provisions of laws in force as well as apply good technical norms.”

The national standards development organization is the **Indonesian Standardization Body (BSN)**. BSN is active in developing national standards (referred to as SNI standards), with over 14,000 active across all sectors as of April 2022. The large majority of SNI standards are voluntary, but some (over 200 as of April 2022) are made mandatory by technical regulation. Over 100 standards are currently active for the oil and gas sector, four of which have been made mandatory by ESDM:

- *SNI 13-3473-1994, Fluid Transportation Systems for Hydrocarbons*
- *SNI 13-3474-1994, Gas Transmission and Distribution Piping System*
- *SNI IEC 60196:2015, General Electrical Installation Requirements 2000 (PUIL 2011)*
- *SNI 0255:2011+Amd 1, Standard Frequency*

In 2018, ESDM issued [Regulation 1846 K/18/MEM/2018, Use of Standards in Oil and Gas Business Activities](#) (“*The Regulation*”), which requires oil and gas sector participants to comply with all mandatory SNI standards. Where no applicable mandatory SNI standards exist, the regulation permits oil and gas companies to adopt either voluntary SNI standards or other international standards (i.e., API or other standards) specifically listed by the regulation. The Directorate General for Oil and Gas within ESDM must approve of use of any standards outside of those specifically listed by the regulation.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

[The Regulation](#) lists the international and foreign oil and gas standards permitted for use in Indonesia, which includes numerous API, ISO, ASTM, ASME and ANSI standards. 140 are API standards:

| | |
|-----------------------------------|---|
| Exploration and Production | <p><i>API RP 2A, Recommended Practice For Planning, Designing And Constructing Fixed Offshore Platforms</i></p> <p><i>API RP 2A-WSD, Planning, Designing, and Constructing Fixed Offshore. Platforms—Working Stress Design</i></p> <p><i>API RP 2SIM, Structural Integrity Management of Fixed Offshore Structures.</i></p> <p><i>API SPEC 2MT1, Specification for Carbon Manganese Steel Plate with Improved Toughness for Offshore Structures</i></p> <p><i>API SPEC 2MT2, Rolled Shapes with Improved Notch Toughness</i></p> <p><i>API SPEC 2H, Specification for Carbon Manganese Steel Plate for Offshore Structures</i></p> <p><i>API SPEC 2Y, Specification for Steel Plates, Quenched-and-Tempered, for Offshore Structures</i></p> <p><i>API SPEC 2W, Specification for Steel Plates for Offshore Structures, Produced by Thermo-Mechanical Control Processing (TMCP)</i></p> <p><i>API SPEC 2C, Offshore Pedestal-mounted Cranes</i></p> <p><i>API 2FB, Recommended Practice for the Design of Offshore Facilities against Fire and Blast Loading</i></p> <p><i>API RP 2D, Operation and Maintenance of Offshore Cranes</i></p> <p><i>API SPEC 5L, Line Pipe</i></p> <p><i>API RP 5L1, Recommended Practice for Railroad Transportation of Line Pipe</i></p> <p><i>API RP 5L2, Recommended Practice for Internal Coating of Line Pipe for Non-corrosive Gas Transmission Service</i></p> <p><i>API RP 5LW, Recommended Practice for Transportation of Line Pipe on Barges and Marine Vessels</i></p> <p><i>API RP 2T, Planning, Designing, and Constructing Tension Leg Platforms</i></p> <p><i>API 2RD, Design of Risers for Floating Production Systems (FPSs) and Tension-Leg Platforms (TLPs)</i></p> <p><i>API RP 2GEO, Geotechnical and Foundation Design Considerations</i></p> <p><i>API RP 2SK, Design and Analysis of Stationkeeping Systems for Floating Structures</i></p> <p><i>API RP 2FPS, Planning, Designing, and Constructing Floating Production Systems</i></p> <p><i>API 2MOP, Petroleum and natural gas industries - Specific requirements for offshore structures, Part 6-Marine operations</i></p> |
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**Exploration and
Production (cont.)**

API 570, Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems

API RP 572, Inspection of Pressure Vessels

API RP 576, Inspection of Pressure-Relieving Devices

API RP 2201, Safe Hot Tapping Practices in the Petroleum & Petrochemical Industries

API SPEC 2F, Mooring Chain

API BULL 75L, Guidance Document for the Development of a Safety and Environmental Management System for Onshore Oil and Natural Gas Production Operations and Associated Activities

API 541, Form-wound Squirrel Cage Induction Motors—375 kW (500. Horsepower) and Larger

API RP 686, Recommended Practice for Machinery Installation and Installation Design

API SPEC 6FA, Specification for Fire Test for Valves

API SPEC 6FB, Specification for Fire Test for End Connections

API SPEC 5LC, CRA Line Pipe

API SPEC 5LD, CRA Clad or Lined Steel Pipe

API SPEC 6D, Pipeline Valves

API SPEC 15LE, Polyethylene Line Pipe

API SPEC 17J, Unbonded Flexible Pipe

API SPEC 17L1, Flexible Pipe Ancillary Equipment

API SPEC 17TR2, Ageing of PA-11 in Flexible Pipes

API RP 17L2, Recommended Practice for Flexible Pipe Ancillary Equipment

API 6DSS, Subsea Pipeline Valves

API RP 14F, Recommended Practice for Design and Installation of Electrical Systems for Offshore Production

API RP 14FZ, Recommended Practice for Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Zone 0, Zone 1 and Zone 2 Locations

API RP 14C, Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms

API RP 14J, Recommended Practice for Design and Hazards Analysis for Offshore Production Facilities

API RP 14G, Recommended Practice for Fire Prevention and Control on Open Type Offshore Production Platforms

API RP 15S, Qualification of Spoolable Reinforced Plastic Line Pipe

**Exploration and
Production (cont.)**

API RP 17B, Recommended Practice for Flexible Pipe

API RP 17A, Design and Operation of Subsea Production Systems-General Requirements and Recommendations

API SPEC 17D, and Operation of Subsea Production Systems-Subsea Wellhead and Tree Equipment

API 17F

API RP 17H, Recommended Practice for Remotely Operated Tools and Interfaces on Subsea Production Systems

API RP 17N, Recommended Practice on Subsea Production System Reliability, Technical Risk, and Integrity Management

API RP 17P, Recommended Practice for Subsea Structures and Manifolds

API RP 17V, Recommended Practice for Analysis, Design, Installation, and Testing of Safety Systems for Subsea Applications

API RP 17W, Recommended Practice for Subsea Capping Stacks

API RP 17R, Recommended Practice for Flowline Connectors and Jumpers

API RP 17U, Recommended Practice for Wet and Dry Thermal Insulation of Subsea Flowlines and Equipment

API RP 17Q, Recommended Practice on Subsea Equipment Qualification

API RP 17S, Recommended Practice for the Design, Testing, and Operation of Subsea Multiphase Flow Meters

API STD 53, Well Control Equipment Systems for Drilling Wells

API RP 55, Recommended Practice for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide

API RP 85, Use of Subsea Wet-gas Flowmeters in Allocation Measurement Systems

API RP 86, Recommended Practice for Measurement of Multiphase Flow

API RP 170, Recommended Practice for Subsea High Integrity Pressure Protection System (HIPPS)

API Spec 6A, Specification for Wellhead and Christmas Tree Equipment

API SPEC 6AV1, Validation of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service

API SPEC 16A, Drill-through Equipment

API SPEC 16D, Control Systems for Drilling Well

API RP 16Q, Design, Selection, Operation, and Maintenance of Marine Drilling Riser Systems

API RP 17Q, Subsea Equipment Qualification-Standardized Process for Documentation

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| Exploration and Production (cont.) | <p><i>API RP T3, Training And Qualification Of Personnel In Well Control Equipment And Techniques For Drilling On Offshore Locations</i></p> <p><i>API RP 65, Cementing Shallow Water Flow Zones in Deep Water Wells</i></p> <p><i>API SPEC 10A, Cements and Materials for Well Cementing</i></p> <p><i>API RP 10B, Recommended Practice for Testing Well Cements</i></p> <p><i>API SPEC 10D, Bow-string Casing Centralizers</i></p> <p><i>API 5A5, Field Inspection of New Casing, Tubing, and Plain-end Drill Pipe</i></p> <p><i>API SPEC 6A718, Nickel Base Alloy 718</i></p> <p><i>API RP 13B-1, Recommended Practice for Field Testing Water-based Drilling Fluids</i></p> <p><i>API RP 13B-2, Recommended Practice for Field Testing Oil-based Drilling Fluids</i></p> |
| Transportation | <p><i>API 1104, Welding of Pipelines and Related Facilities</i></p> <p><i>API RP 1004, Bottom Loading and Vapor Recovery for MC-306 & DOT-406 Tank Motor Vehicles</i></p> <p><i>API RP 1130, Computational Pipeline Monitoring for Liquids</i></p> <p><i>API RP 1110, Recommended Practice for Pressure Testing of Liquid Petroleum Pipelines</i></p> <p><i>API RP 1111, Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines</i></p> <p><i>API RP 2200, Repairing Crude Oil, Liquefied Petroleum Gas, and Product Pipelines</i></p> <p><i>API RP 2201, Safe Hot Tapping Practices in the Petroleum & Petrochemical Industries</i></p> |
| Refining and Marketing | <p><i>API 620, Design and Construction of Large, Welded, Low-pressure Storage Tanks</i></p> <p><i>API 650, Welded Steel Tanks for Oil Storage</i></p> <p><i>API RP 652, Linings of Aboveground Petroleum Storage Tank Bottoms</i></p> <p><i>API 653, Tank Inspection, Repair, Alteration, and Reconstruction</i></p> <p><i>API SPEC 12P, Specification for Fiberglass Reinforced Plastic Tanks</i></p> <p><i>API 2000, Venting Atmospheric and Low-Pressure Storage Tanks</i></p> <p><i>API 2350, Overfill Prevention & Tank Gauging</i></p> <p><i>API RP 500, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2</i></p> <p><i>API RP 505, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, and Zone 2</i></p> <p><i>API 510, Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration</i></p> <p><i>API RP 520, Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries; Part I - Sizing and Selection</i></p> |

**Refining and
Marketing (cont.)**

API RP 582, Welding Guidelines for the Chemical, Oil, and Gas Industries

API 521, Pressure-relieving and Depressuring Systems

API 526, Flanged Steel Pressure-relief Valves

API 527, Seat Tightness of Pressure Relief Valves

API RP 530, Recommended Practice for Calculation of Heater-Tube Thickness in Petroleum Refineries

API 537, Flare Details for Petroleum, Petrochemical, and Natural Gas Industries

API RP 581, Risk-Based Inspection Methodology

API 584, Integrity Operating Windows

API 602, Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries

API 607, Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats

API 610, Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries

API 611, General-purpose Steam Turbines for Petroleum, Chemical, and Gas Industry Services

API 612, Petroleum, Petrochemical and Natural Gas Industries - Steam Turbines - Special-Purpose Applications

API 613, Special Purpose Gear Units for Petroleum, Chemical and Gas Industry Services

API 614, Lubrication, Shaft-sealing and Oil-control Systems and Auxiliaries

API 616, Gas Turbines for Petroleum, Chemical, and Gas Industry Services

API 617, Axial and Centrifugal Compressors and Expander-compressors

API 618, Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services

API RP 621, Reconditioning of Metallic Gate, Globe, and Check Valves

API 670, Machinery Protection Systems

API 671, Special Purpose Couplings For Petroleum, Chemical And Gas Industry Services

API 672, Packaged, Integrally Geared Centrifugal Air Compressors for Petroleum, Chemical, and Gas Industry Services

API 673, Centrifugal Fans for Petroleum, Chemical, and Gas Industry Services

API 674, Positive Displacement Pumps-Reciprocating

API 675, Positive Displacement Pumps— Controlled Volume

API 676, Positive Displacement Pumps—Rotary

API 677, General-Purpose Gear Units

API 681, Liquid Ring Vacuum Pumps and Compressors

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| Refining and Marketing (cont.) | <p><i>API 682, Pumps - Shaft Sealing Systems for Centrifugal and Rotary Pumps</i></p> <p><i>API 685, Sealless Centrifugal Pumps</i></p> <p><i>API RP 752, Management of Hazards Associated with Location of Process Plant Building</i></p> <p><i>API RP 934-A, Materials and Fabrication Requirements for 2-1/4Cr-1Mo and 3Cr-1Mo Steel Heavy Wall Pressure Vessels for High Temperature, High Pressure Hydrogen Service</i></p> <p><i>API 2510, Design and Construction of Liquefied Petroleum Gas Installations (LPG)</i></p> <p><i>API 752, Management of Hazards Associated with Location of Process Plant Permanent Buildings</i></p> <p><i>API RP 571, Damage Mechanisms Affecting Fixed Equipment in the Refining Industry</i></p> <p><i>API RP 932B, Design, Materials, Fabrication, Operation, and Inspection Guidelines for Corrosion Control in Hydroprocessing Reactor Effluent Air Cooler (REAC) Systems</i></p> <p><i>API TR 938-B, Use of 9CR-1Mo-V (Grade 91) Steel in the Oil Refining Industry</i></p> <p><i>API TR 938-C, Use of Duplex Stainless Steels in the Oil Refining Industry</i></p> <p><i>API RP 1637, Using the API Color-Symbol System to Mark Equipment and Vehicles for Product Identification at Gasoline Dispensing Facilities and Distribution Terminals</i></p> <p><i>API 1542, Identification Markings for Dedicated Aviation Fuel Manufacturing and Distribution Facilities, Airport Storage and Mobile Fuelling Equipment</i></p> |
| Fire Protection, Health and Environmental Issues | <p><i>API RP 2218, Fireproofing Practices in Petroleum & Petrochemical Processing Plants</i></p> <p><i>API 2510A, Fire-Protection Considerations for the Design and Operation of Liquefied Petroleum Gas (LPG) Storage Facilities</i></p> <p><i>API 4602, Minimization, Handling, Treatment, and Disposal of Petroleum Products Terminal Wastewaters</i></p> |

In addition to the Regulation, the upstream regulator, SKK Migas, has issued *Work Procedure Guidelines*, three of which refer to nine API standards. These are:

- *Guideline PTK-062-2021 (Revised), Management of Oil and Gas Operations, which refers extensively to different portions of the API Manual of Petroleum Measurement Standards (MPMS).*
- *Guideline PTK-013-2007, Operation and Maintenance of Petroleum Storage Tanks, which refers to:*
 - *API RP 12R1, Recommended Practice for Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service*
 - *API 620, Design and Construction of Large, Welded, Low-pressure Storage Tanks*
 - *API 650, Welded Steel Tanks for Oil Storage*
 - *API 653, Tank Inspection, Repair, Alteration, and Reconstruction*
 - *API RP 575, Inspection Practices for Low Pressure Storage Tanks*
- *Guideline PTK-012-2007, Operation and Maintenance of Oil and Gas Distribution Pipes, which refers to:*
 - *API 1104, Welding of Pipelines and Related Facilities*
 - *API 1107, Pipeline Maintenance Welding Practices*

JAPAN

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The Ministry of Economy, Trade and Industries Establishment Act provides that the **Ministry of Economy, Trade and Industries (METI)** jurisdiction over various matters relating to energy and mineral resources and the securing of the stable and efficient provision of gas, electric power and heating in Japan. Within METI, regulatory bodies include:

- The **Agency for Natural Resources and Energy**, which oversees comprehensive policies related to energy and mineral resources and the securing of the stable supply of energy; and
- The **Electricity and Gas Market Surveillance Commission**, which monitors the electricity and gas trading markets through activities including compiling reports, conducting on-site inspections, providing recommendations to businesses.

Japan has few oilfields, all of which have limited production volume. Laws including the **Oil Stockpiling Act and the Petroleum Supply and Demand Optimization Act** aim to secure stable supplies of oil. The Oil Pipeline Business Act regulates the operation of oil pipeline projects. The primary source of legislation regulating businesses involving liquid petroleum gas (LPG) is the Act Concerning the Securing of Safety and the Optimisation of Transaction of Liquefied Petroleum Gas (the LP Gas Act), along with its associated regulations. The LP Gas Act stipulates registration processes for the sale of LPG. The transportation and storage of LPG are regulated by the LP Gas Act as well as the High-Pressure Gas Safety Act.

The **Japanese Industrial Standards Committee (JISC)**, within the Japanese **Ministry of Economy, Trade, and Industry (METI)**, is Japan's national standardization body. JISC develops standards covering mineral or industrial products, data, and services, including quality, performance, and test methods. JISC is also responsible for Japan's growing contribution to setting international standards through its work with the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). Standards are then published through the **Japanese Standards Association (JSA)**, an independent foundation.

Specifically for the hydrocarbon sector, the private sector-led **Japan Petroleum Institute (JPI)** is the association responsible for developing and issuing industry-led standards. It has issued over 82 standards with the abbreviation JPI.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

The Japanese Industrial Standards (JIS) issued by JISC frequently reference international ISO standards. Many JPI standards, on the other hand, are modeled on API standards for tubular goods (API Series 5 standards), though are not referenced by name.

MALAYSIA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

Malaysia's state-owned oil company, **Petroleum Nasional Berhad (PETRONAS)** owns all oil and gas resources in Malaysia and thus negotiates concession agreements with the private sector, serving as the chief regulator for the upstream sector. Within PETRONAS, **Malaysia Petroleum Management (MPM)** oversees all exploration and production activities, including promotion of exploration investments, optimization of exploration and production assets, and operations of upstream companies, in furtherance of the national interest. PETRONAS also issues its own technical standards, coded as PTS.

The **Ministry of International Trade and Industry (MITI)** regulates and issues permits for refining and processing oil and gas, while the **Ministry of Domestic Trade and Consumer Affairs (KPDNHEP)** issues licenses for marketing and distribution of oil and gas. The **Ministry of Natural Resources and the Environment (MNRE)** also regulates environmental aspects of oil and gas activity.

The chief law and accompanying regulations governing oil and gas activity in Malaysia are the Petroleum Development Act of 1974 and the Petroleum Regulations 1974. These do not require compliance with any specific technical standards, but PETRONAS, MITI, and MDTCC may require participants to comply with certain standards as part of their authority as regulators.

The **Department of Standards Malaysia (DSM)** under MITI is the national standards development organization. DSM is active in developing and issuing national Malaysian standards (MS), a number of which have been made mandatory by the appropriate regulators. For the oil and gas sector, DSM has issued over 531 active standards (as of June 2022), the vast majority of which are voluntary or recommended. 17 have been made mandatory by MITI, MDTC, or MNRE, including:

- *MS ISO 3183, Petroleum and Natural Gas Industries – Steel Pipe for Pipeline Transportation Systems*
- *MS 830:2003, Code of Practice for the Storage, Handling, and Transportation of Liquefied Petroleum Gases*
- *MS 2381, Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless - Specification*
- *MS 761: 1982, Code of Practice for the Storage and Handling of Flammable and Combustible Liquids*
- *MS 563, Test Method for Distillation of Petroleum Products at Atmospheric Pressure*
- *MS 1891, Test method for Sulphur in petroleum products by wavelength dispersive x-ray fluorescence spectrometry*
- *MS 1893, Test method for density, relative density (specific gravity), or API gravity of crude petroleum and liquid petroleum products by hydrometer method*
- *MS 2012, Test method for vapor pressure of petroleum products (Reid method)*

In addition to DSM's work on national standards, PETRONAS also issues its own technical standards (PTS), along with policy manuals for the upstream sector.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

A wide variety of MS standards are modeled on ISO standards as evidenced by their title. For example:

- MS ISO 3183, Petroleum and Natural Gas Industries – Steel Pipe for Pipeline Transportation Systems
- MS ISO 3448, Industrial Liquid Lubricants – ISO Viscosity Classification
- MS ISO 3171:2009, Petroleum Liquids – Automatic Pipeline Sampling

Many MS standards also make normative references to API standards (as well as other international standards). Two of Malaysia’s mandatory MS standards refer to eight API standards:

| MS Standard | API Standards Referenced |
|--|--|
| MS 761: 1982, Code of Practice for the Storage and Handling of Flammable and Combustible Liquids | <p><i>API SPEC 12B, Bolted Production Tanks</i></p> <p><i>API SPEC 12D, Lar Welded Production Tanks</i></p> <p><i>API SPEC 12F, Shop Welded Tanks for Storage of Production Liquids</i></p> <p><i>API 620, Design and Construction of Large, Welded, Low-pressure Storage Tanks</i></p> <p><i>API 650, Welded Steel Tanks for Oil Storage</i></p> <p><i>API 2000, Venting Atmospheric and Low-Pressure Storage Tanks</i></p> |
| MS 830:2003, Code of Practice for the Storage, Handling, and Transportation of Liquefied Petroleum Gases | <p><i>API RP 520, Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries</i></p> <p><i>API RP 521, Pressure-relieving and Depressuring Systems</i></p> |

PETRONAS's *Procedures and Guidelines for Upstream Activities (PPGUA 4.1)* refers throughout to international standards, including thirteen 13 API standards. These are:

| Applicable PPGUA 3.0 Chapter | API Standards Referenced |
|------------------------------|---|
| Operations Management | <p><i>API 17B, Recommended Practice for Flexible Pipe</i></p> <p><i>API Manual of Petroleum Measurement Standards</i></p> |
| Well and Drilling Operations | <p><i>API RP 500B, Recommended Practice for Classification of Locations for Electrical Installations at Drilling Rigs and Production Facilities on Land and on Marine Fixed and Mobile Platforms</i></p> <p><i>API RP 2SK, Recommended Practice for In-Service Inspection of Mooring Hardware for Floating Drilling Units</i></p> <p><i>API SPEC 10A, Cements and Materials for Well Cementing</i></p> <p><i>API RP 10B-2, Recommended Practice for Testing Well Cements</i></p> <p><i>API RP 10B-3, Testing of Well Cements Used in Deepwater Well Construction</i></p> <p><i>API RP 10F, Recommended Practice for Performance Testing of Cementing Float Equipment</i></p> <p><i>API 53, Well Control Equipment Systems for Drilling Wells</i></p> <p><i>API RP 64, Recommended Practice for Diverter Systems Equipment and Operations</i></p> <p><i>API RP 13B-1, Recommended Practice for Field Testing of Water-based Drilling Fluids</i></p> <p><i>API RP 14C, Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms</i></p> <p><i>API SPEC 4F, Specification for Drilling and Well Servicing Structures</i></p> |

In addition, 16 of Petronas's PTS standards reference a total of 18 API standards:

| PTS Standard | API Standards Referenced |
|---|--|
| PTS 11.30.08, Dynamic Riser Design | <i>API STD 2RD, Dynamic Risers for Floating Production Systems</i> |
| PTS 11.30.10, Unbonded Flexible Pipe for Offshore Pipelines & Risers | <i>API SPEC 17J, Unbonded Flexible Pipe</i> <i>API RP 17B, Flexible Pipe</i> |
| PTS 11.31.01, Specification for Pipeline Valves | <i>API 6D, Pipeline Valves</i> <i>API 6DSS, Subsea Pipeline Valves</i> |
| PTS 12.22.02, Vertical Storage Tank | <i>API 65, Wellbore Plugging and Abandonment</i> |
| PTS 12.22.07, Fiberglass Reinforced Plastic Tanks | <i>API SPEC 12P, Fiberglass Reinforced Plastic Tanks</i> |
| PTS 12.51.01, Design And Operation Of Subsea Production Systems – Subsea Umbilicals | <i>API 17E, Subsea Umbilicals</i> |
| PTS 14.50.01, Subsea Production Control Systems – Subsea Equipment | <i>API 17F, Subsea Production Control Systems</i> |
| PTS 14.50.02, Subsea Production Control Systems – Topside Equipment | <i>API 17F, Subsea Production Control Systems</i> |
| PTS 15.10.02, Materials and Fabrication of Chromium - Molybdenum Steel Heavy Wall Pressure Vessels for High-Temperature, High-Pressure Hydrogen Service | <i>API RP 934-A, Materials and Fabrication Requirements for 2-1/4Cr-1Mo and 3Cr-1Mo Steel Heavy Wall Pressure Vessels for High Temperature, High Pressure Hydrogen Service</i> |
| PTS 15.10.04, CRA Clad or Lined Steel Pipe | <i>API SPEC 5LD, CRA Clad or Lined Steel Pipe</i> |
| PTS 15.10.05, Specification For CRA Line Pipe | <i>API SPEC 5LC, CRA Lined Pipe</i> |
| PTS 15.10.07, Line Pipe | <i>API 5L, Line Pipe</i> |
| PTS 15.10.16, Nickel Base Alloy 718 (UNS N07718) For Oil And Gas Drilling And Production Equipment | <i>API SPEC 6A718, Nickel Base Alloy 718 (UNS N07718) for Oil and Gas Drilling and Production Equipment</i> |
| PTS 15.12.01, Welding for Chemical, Oil, and Gas Industries | <i>API RP 582, Welding Guidelines for the Chemical, Oil, and Gas Industries</i> |
| PTS 15.12.04, Welding of Pipelines and Related Facilities | <i>API 1104, Welding of Pipelines and Related Facilities</i> |
| PTS 19.30.05, Marine Transportation for Structure and Linepipes | <i>API RP 5LW, Transportation of Line Pipe on Barges and Marine Vessels</i> |

SINGAPORE

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

Singapore does not have oil reserves and thus does not have upstream oil and gas activity. It is however, a major hub in Southeast Asia for refining, storage, and distribution of oil and gas.

Singapore does not have a regulator or regulatory framework specific to the oil sector, but downstream oil activities are subject to environmental regulation by the **National Environment Agency** and worker safety regulation by the **Ministry of Manpower's Occupational Safety and Health Division**. Oil sector activities are also subject to fire safety laws and regulations administered by the **Singapore Civil Defence Force** under the Ministry of Home Affairs.

The gas sector is subject to the above, as well as regulation by the **Energy Market Authority**, a statutory board under the **Ministry of Trade and Industry**. EMA licenses the transport, import, shipping, and retail of natural gas as well as LNG operators and onshore receiving facilities for piped natural gas.

Enterprise Singapore is the national standards development organization and administers the Singapore Standardization Program with the advice and assistance of the **Singapore Standards Council**, made up of public and private sector leaders appointed by Enterprise Singapore. Enterprise Singapore has issued over 800 voluntary standards, including a handful for the oil and gas sector.

The regulations governing oil and gas activities in Singapore do not specify the standards with which companies must comply, but instead permit the relevant authorities to refer to relevant national or international standards when determining compliance.

For example, the Fire Safety Act (Cap.109A), which requires licenses for operating pipelines that convey petroleum, permits the Commissioner of the Civil Defence Force to adopt standards issued by the Enterprise Singapore or by any other standards organization. Under the Environmental Protection and Management Act (Cap. 94A) (EPMA), the National Environment Agency must grant companies permission to occupy or use premises used for petroleum refining, and may require the use of certain internationally-recognized technical standards.

Major oil and gas companies operating in Singapore may also use or require use of standards by their contractors and suppliers. The largest investors in Singapore's downstream energy activities are **Singapore Petroleum Company (SPC)**, a subsidiary of the state-owned Chinese oil company PetroChina; **Caltex**, owned by Chevron; **ExxonMobil**, and **Royal Dutch Shell**.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Since no specific standards are made mandatory by Singaporean regulators, **use of standards vary widely among participants in the sector**. The decision to adopt certain standards are typically made for business reasons, not necessarily based on the strength of the standards, and may depend on geographical preference (i.e., API versus European or British standards).

Enterprise Singapore has issued several national voluntary standards that are relevant to the oil and gas sector.

- *SS 634 (2018), Code of Practice for Fire Safety for Open Plant Processing Facilities in Oil, Chemical and Process Industries*
- *SS 281 (1984), Pressure Regulators for Liquefied Petroleum Gases*
- *SS 294 (1998), Valves for Use with Domestic and Industrial Liquefied Petroleum Gas (LPG) Cylinders*
- *SS ISO 19905 (2017), Site Specific Assessment of Mobile Offshore Units – Part 1: Jack-ups*

Enterprise Singapore's catalogue of national standards does not indicate whether API or other international standards are referenced, though some are titled after ISO standards.

In examining *SS634, Code of Practice for Fire Safety for Open Plant Processing Facilities in Oil, Chemical and Process Industries*, references to 14 API standards were identified. These include:

- *API 2G, Production Facilities on Offshore Structures*
- *API 2L Planning, Designing and Constructing Heliports for Fixed Offshore Platforms*
- *API 14C, Recommended Practice for Analysis, Design Installation and Testing of Basic Surface Safety Systems on Offshore Production Platforms*
- *API 14F, Design and Installation of Electrical Systems for Offshore Production Platforms (included in the Electrical Manual)*
- *API 14G, Fire Prevention and Control on Open Type Offshore Production Platforms*
- *API 4322, Fugitive Hydrocarbon Emissions from Petroleum Production Operations, Volumes I and II (1980)*
- *API 540, Electrical Installations in Petroleum Refineries*
- *API 500, Classification of Locations for Electrical Installation in Petroleum Facilities*
- *API 521, Guide for Pressure-Relieving and Depressuring Systems*
- *API 752, Management of Hazards Associated with Location of Process Plant Buildings*
- *API 2021, Guide for Fighting Fires In and Around Petroleum Storage Tanks*
- *API 2218, Guideline for Fireproofing Practices in Petroleum and Petrochemical Processing Plants*
- *API 2510A, Fire-Protection Considerations for the Design and Operation of Liquefied Petroleum Gas (LPG) Storage Facilities*
- *API Guide for the Inspection of Refinery Equipment, Chapter XVI, Pressure-Relieving Devices*

VIETNAM

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The **VietNam Oil and Gas Group (PetroVietNam or PVN)**, VietNam's state-owned oil and gas company, controls oil and gas resources in VietNam and frequently acts as de facto regulator for private sector participation. PVN's upstream subsidiary, PetroVietNam Exploration Production Corporation (PVEP) negotiates and signs concession agreements with private sector partners for exploration and production, while PVN's subsidiaries PetroVietNam Oil Company, the PetroVietNam Gas Company, and the Binh Son Refinery, among others, are involved in downstream activities.

The **Department of Energy and Petroleum** within the **Ministry of Industry and Trade** also coordinates closely with PVN and the Prime Minister of VietNam on the development of the oil and gas sector. Furthermore, the **Ministry of Natural Resource and Environment** also fulfills some duties related to environmental management of oil and gas.

VietNam's primary law for the oil and gas sector is the Petroleum Law ("the Law"). The Law does not specify use of any standards, but instead requires that petroleum operators "utilize advanced technology and comply with VietNameese Laws regarding the protection of natural resources and the environment, and the safety of person and property." The Law also requires that petroleum operators develop a plan for environmental protection, take all measures to prevent pollution, and promptly eliminate sources of pollution," as well as establish a "safety zone around installations servicing Petroleum Operations in compliance with regulations of the Government of VietNam."

VietNam's national standards development organization is the Directorate for **Standards, Metrology, and Quality (STAMEQ)** within the **Ministry of Science and Technology**. Within STAMEQ, the **VietNam Standards and Quality Institute (VSQI)** assists the development, publishing, and issuing of national standards. STAMEQ is highly active in issuing national standards, which are divided into national standards (TCVN), organizational standards (TCCS), national technical regulations (QCVNs), and local technical regulations (QCDPs). Technical regulations are mandatory, while standards are generally voluntary.

Technical regulations that have been issued for the oil and gas sector include QCVN 8:2012/BKHCHN, National Technical Regulation for Liquefied Petroleum Gas (LPG), and QCVN 35: 2010 / BTNMT, National Technical Regulations on Wastewater from Offshore Oil and Gas Works. STAMEQ has also issued over 300 active national standards (TCVNs) for the oil and gas sector, some of which are cited by the technical regulations.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

International standards are widely used in VietNam. **Oil and gas operators in VietNam frequently use GOST technical standards (Russia), though API, ISO, and ASTM standards are also commonly in use.**

A large portion of national TCVN standards make normative references to international standards, including API, ISO, EN, and ASTM standards. In particular, many of the TCVN measurement standards refer to the API Manual of Petroleum Measurement Standards (MPMS). According to the most recently updated STAMEQ database, there were 39 references to API standards and the MPMS:

| TVCN Standard | API Standards Referenced |
|---|---|
| <p><i>TCVN 9734:2013, Reciprocating positive displacement pumps for Petroleum, petrochemical and natural gas industries</i></p> | <p><i>API 526, Flanged steel pressure relief valves</i></p> <p><i>API 541, Form-wound squirrel cage induction motors-250 horsepower and larger</i></p> <p><i>API 546, Brushless synchronous machines-500 kVA and larger</i></p> <p><i>API 611, General-purpose steam turbines for petroleum, chemical, and gas industry services</i></p> <p><i>API 677, General-purpose gear units for petroleum, chemical and gas industry services</i></p> <p><i>API RP 686, Machinery installation and installation design</i></p> |
| <p><i>TCVN 9733:2013, Centrifugal pumps for petroleum, petrochemical and natural gas industries</i></p> | <p><i>API 541, Form-Wound Squirrel-Cage Induction Motors-500 Horsepower and Larger</i></p> <p><i>API 611, General-Purpose Steam Turbines for Petroleum, Chemical, and Gas Industry Services</i></p> <p><i>API 670, Machinery Protection Systems API API 671, Special Purpose Couplings for Petroleum, Chemical and Gas Industry Services</i></p> <p><i>API 547, General-Purpose Form-Wound Squirrel Cage Induction Motors-250 Horsepower and Larger</i></p> <p><i>API 677, General-Purpose Gear Units for Petroleum, Chemical and Gas Industry Services</i></p> |
| <p><i>TCVN 9791:2013, Standard Test Method for Water in Crude Oil by Distillation</i></p> | <p><i>API MPMS, Chapters 8 and 10</i></p> |
| <p><i>TCVN 9451:2013, Packaged, integrally geared centrifugal air compressors</i></p> | <p><i>API Std 670, Vibration, axial position, and bearing temperature monitoring systems</i></p> <p><i>API RP 520 Sizing, selection, and installation of pressure-relieving devices in refineries,</i></p> |
| <p><i>TCVN 9450-2:2013 Rotary-type positive displacement compressors. Part 2: Packaged air compressors (oil-free)</i></p> | <p><i>API 614:1995, Lubrication, Shaft-Sealing, and Control-Oil Systems for Special-Purpose Application</i></p> <p><i>API 661:1992, Air-Cooled Heat Exchangers for General Refinery Service</i></p> <p><i>API 670:1993, Vibration, Axial-Position, and Bearing-Temperature Monitoring Systems</i></p> <p><i>API 671:1990, Special-Purpose Couplings for Petroleum, Chemical, and Gas Industry Services</i></p> |

| TVCN Standard | API Standards Referenced |
|---|--|
| <p><i>TCVN 9449:2013, Petroleum, chemical and gas service industries. Centrifugal compressors</i></p> | <p><i>API RP 550, Manual on installation of refinery instruments and control systems</i></p> <p><i>API 670, Machinery protection systems, fourth edition</i></p> |
| <p><i>TCVN 8617:2010, Liquefied natural gas (LNG). Vehicular fuel systems</i></p> | <p><i>API 620, Design and Construction of Large, Welded, Low Pressure Storage Tanks, 1996</i></p> |
| <p><i>TCVN 8404:2010, Rules for Classification and Technical Supervision of Flexible Pipe Systems</i></p> | <p><i>API 6FB Fire test for end connections</i></p> <p><i>API RP 17B-2002:Recommend Practice for Flexible Pipe</i></p> <p><i>API 17J-2002 Specification for Unbonded Flexible Pipes</i></p> <p><i>API 17K-2002 Specification for Bonded Flexible Pipes</i></p> |
| <p><i>TCVN 8403:2010, Rules for Classification and Technical Supervision of Dynamic Riser Systems</i></p> | <p><i>API 17J-2002 Specification for Unbonded Flexible Pipes</i></p> |
| <p><i>TCVN 12012:2017, Standard Guide for Use of the Petroleum Measurement Tables</i></p> | <p><i>API MPMS</i></p> |
| <p><i>TCVN 6594:2007, Crude petroleum and liquid petroleum products, Determination of density, relative density (specific gravity), or API gravity, Hydrometer Method</i></p> | <p><i>API MPMS Chapter 8</i></p> |
| <p><i>TCVN 2692:2007, Petroleum products and bituminous materials. Test method for determination of water by distillation</i></p> | <p><i>API MPMS, Chapters 8 and 10</i></p> |
| <p><i>TCVN 10953-1:2015, Guidelines for petroleum measurement. Proving systems. Part 1: General</i></p> | <p><i>API MPMS, Chapters 4, 11-13</i></p> |
| <p><i>TCVN 10953-2:2015, Guidelines for petroleum measurement. Proving systems. Part 2: Tank provers</i></p> | <p><i>API MPMS, Chapters 7, 12</i></p> |
| <p><i>TCVN 10953-3:2015, Guidelines for petroleum measurement. Proving systems. Part 3: Master meter provers</i></p> | <p><i>API MPMS, Chapters 4-5</i></p> |
| <p><i>TCVN 10954-1:2015, Guidelines for petroleum measurement. Level measurement of liquid hydrocarbons in stationary tanks by automatic tank gauges (ATG). Part 1: General requirements</i></p> | <p><i>API MPMS Chapters 1-3</i></p> |
| <p><i>TCVN 10954-2:2015, Guidelines for petroleum measurement. Level measurement of liquid hydrocarbons in stationary tanks by automatic tank gauges (ATG). Part 2: General requirements for the installation</i></p> | <p><i>API MPMS Chapters 1-3</i></p> |

| TVCN Standard | API Standards Referenced |
|---|---|
| <p><i>TCVN 10955-1:2015, Guidelines for petroleum measurement. Measurement of liquid hydrocarbon. Part 1: Displacement meters</i></p> | <p><i>API MPMS Chapters 4, 12</i></p> |
| <p><i>TCVN 10956-1:2015, Guidelines for petroleum measurement. Flow measurement using electronic metering systems. Part 2: Turbine meters</i></p> | <p><i>API MPMS Chapters 4, 5, 12</i></p> <p><i>API RP 500, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2</i></p> |
| <p><i>TCVN 10957-1:2015, Guidelines for petroleum measurement. Mass measurement of natural gas liquids</i></p> | <p><i>API MPMS Chapters 5, 11, 12, 14</i></p> |
| <p><i>TCVN 10960:2015, Guidelines for petroleum measurement. Proving systems. Manual gauging</i></p> | <p><i>API MPMS Chapters 2, 3, 17</i></p> |
| <p><i>TCVN 12823-1:2020: Mobile Offshore Units. Part 1: Classification</i></p> | <p><i>API RP 2I</i></p> <p><i>API SPEC 9A</i></p> <p><i>API RP 9B</i></p> |



SUB-SAHARAN AFRICA

ANGOLA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The **Ministry for Mineral Resources and Petroleum (MIREMPET)** is the chief regulator for natural gas and oil activities in Angola. Within MIREMPET, the **National Agency for Petroleum, Gas and Biofuels (ANPG)** grants concession rights and licensing for exploration and production. Though the government began liberalizing the sector in 2018, the national state-owned oil company, Sonangol, still plays a role in shaping the market as a participant in upstream, midstream, and downstream operations.

For the downstream segment, the **Regulatory Institute for Petroleum Derivatives (IRD)** within MIREMPET oversees processing, storage, distribution, import, transport, and sales of petroleum-derived products.

The *Petroleum Activities Law* (Law 10/04) provides the legal framework for exploration and production activities in Angola. According to the law, MIREMPET may authorize the use of technical standards by executive decree. MIREMPET has issued a number of technical regulations, including:

- *Executive Decree 38/09, on health and safety requirements for natural gas and oil operations*
- *Executive Decree 39/00, on environmental protection requirements for natural gas and oil operations*
- *Executive Decrees 188/08, 189/08, 193/08, 200/08, and 203/08, on construction and operation of gas pipelines*
- *Executive Decree 187/08, on requirements for metrological control of gas meters*

The **Angolan Institute for Standardization and Quality (IANORQ)** is the national standards development organization, which has published 342 voluntary standards in its 2019 catalogue. Most of these were developed and published as part of the country's National Normalization Plan 2016-2020. However, no national standards yet pertain to the natural gas and oil sector.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Executive Decree 38/09, which lays out the health and safety requirements for natural gas and oil operations, requires all operations, processes, and equipment to be compliant with national or international standards. The regulation defines “international standards” as guidelines and/or codes of conduct similar to those recognized in an attached annex, which references API, ISO, and IEC standards, among others. The following five API standards are referenced:

- *API RP 14B, Design, Installation, Operation, Test, and Redress of. Subsurface Safety Valve Systems*
- *API RP 17B, Recommended Practice for Flexible Pipe*
- *API RP 13B2, Recommended Practice for Field Testing of Oil-based Drilling Fluids*
- *API SPEC 7J, Drill Pipe/Casing Protectors*
- *API RP 14C, Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms*
 - Executive Decrees 200/08 and 203/08, regarding technical requirements for the construction and operation of pipelines, each require compliance with three API standards or their technical equivalents:
- *API SPEC 5L, Line Pipe*
- *API SPEC 6D, Pipeline Valves*
- *API 1104, Standard for Welding Pipelines and Related Facilities*

Additionally, in to the downstream segment, IRDP has issued requirements for licensing of imported lubricating oils that require certification according to API’s Engine Oil program.

EQUATORIAL GUINEA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

Equatorial Guinea is situated in the center of West Africa and is a major producer of oil. The **Ministry of Mines, Industry and Energy (MMIE)** supervises all oil and gas projects, and is working on an integrated gas collection for projects throughout the region. The Ministry is headed by the Secretary General, who is considered the head of all personnel. Unless the matter is reserved for a different Department Body, the Secretary General is head of personnel and has full control to resolve all matters referred to the Ministry,

GE Petrol is Equatorial Guinea's national oil company, which reports directly to MMIE. GE Petrol acts as a state-agent and works together with the Ministry to coordinate all affairs related to the petroleum industry. Similarly **SONOGAS**, which also reports to MMIE, is the state-owned natural gas company that operates the country's gas sector. SONOGAS owns a stake in **EG LNG**, which manages the country's LNG facilities

Law No. 8/2006 of Hydrocarbons, and Regulation No. 04/2013, on Petroleum Operations Regulations establish the procedures and performance standards for exploration, evaluation, development, transportation, distribution, storage, refining, commercialism, and other related activities. Both set the international standards to which oil and gas operators must conform their services and equipment. A new regulation regarding operations in the oil gas sector, Regulation No. 2/2020 on Petroleum Operations, was issued in 2020.

Equatorial Guinea does not have a national standardization organization nor are they members of the International Organization for Standardization (ISO).

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Law No. 8/2006 on Hydrocarbons and Regulations No. 04/2013 and No. 2/2020 on Petroleum Operations refer extensively to international standards, including API. A total of 84 standards are referenced by Equatorial Guinea's laws and regulations:

| Measure | API Standards Referenced |
|--------------------------------|---|
| Law No. 8/2006 on Hydrocarbons | <i>Manual of Petroleum Measurement Standards (MPMS)</i> <i>API 2550, Method for Measurement and Calibration of Upright Cylindrical Tanks</i> <i>API 2551, Method for Measurement and Calibration of Horizontal Tanks</i> <i>API 2552, Measurement and Calibration of Spheres and Spheroids</i> <i>API 2553, Measurement and Calibration of Barges</i> <i>API 2554, Measurement and Calibration of Tank Cars</i> <i>API 2555, Method for Liquid Calibration of Tanks</i> |

| Measure | API Standards Referenced |
|--|---|
| Regulation No. 04/2013 on Petroleum Operations | <p><i>Manual of Petroleum Measurement Standards (MPMS)</i></p> <p><i>API 2550, Method for Measurement and Calibration of Upright Cylindrical Tanks</i></p> <p><i>API 2551, Method for Measurement and Calibration of Horizontal Tanks</i></p> <p><i>API 2552, Measurement and Calibration of Spheres and Spheroids</i></p> <p><i>API 2553, Measurement and Calibration of Barges</i></p> <p><i>API 2554, Measurement and Calibration of Tank Cars</i></p> <p><i>API 2555, Method for Liquid Calibration of Tanks</i></p> |
| Regulation No. 2/2020 on Petroleum Operations | <p><i>Manual of Petroleum Measurement Standards (MPMS)</i></p> <p><i>API RP 2A, Planning, Designing and Constructing Fixed Offshore Platforms</i></p> <p><i>API RP 2D, Recommended Practice for Operation and Maintenance of Offshore Cranes</i></p> <p><i>API RP 2I, Recommended Practice for In-service Inspection of Mooring Hardware for Floating Structures</i></p> <p><i>API RP 2L, Recommended Practice for Planning, Designing, and Constructing Heliports for Fixed Offshore Platforms</i></p> <p><i>API RP 2M, Recommended Practice for Qualification Testing of Steel Anchor Designs for Floating Structures</i></p> <p><i>API RP 2P, Recommended Practice for the Analysis of Spread Mooring Systems for Floating Drilling Units</i></p> <p><i>API RP 2R, Recommended Practice for Design, Rating, and Testing of Marine Drilling Riser Couplings</i></p> <p><i>API RP 2T, Planning, Designing, and Constructing Tension Leg Platforms</i></p> <p><i>API RP 2X, Recommended Practice for Ultrasonic and Magnetic Examination of Offshore Structural Fabrication and Guidelines for Qualification of Technicians</i></p> <p><i>API RP 3, Recommended Practice for Care and Use of Cable Drilling and Fishing Tools</i></p> <p><i>API RP 4G, Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures</i></p> |

| Measure | API Standards Referenced |
|---|--|
| Regulation No. 2/2020 on Petroleum Operations (cont.) | <p><i>API RP 5B1, Gauging and Inspection of Casing, Tubing, and Line Pipe Threads</i></p> <p><i>API RP 5C1, Recommended Practice for Care and Use of Casing and Tubing</i></p> <p><i>API RP 5A5, Field Inspection of New Casing, Tubing, and Plain-end Drill Pipe</i></p> <p><i>API RP 5C5, Procedures for Testing Casing and Tubing Connections</i></p> <p><i>API RP 6AR, Recommended Practice for Repair and Remanufacture of Wellhead and Christmas Tree Equipment</i></p> <p><i>API RP 7A1, Recommended Practice for Testing of Thread Compound for Rotary Shouldered Connections</i></p> <p><i>API RP 7G, Recommended Practice for Drill Stem Design and Operating Limits</i></p> <p><i>API RP 8B, Recommended Practice for Procedures for Inspections, Maintenance, Repair, and Remanufacture of Hoisting Equipment</i></p> <p><i>API RP 9B, Application, Care, and Use of Wire Rope for Oil Field Service</i></p> <p><i>API RP 10E, Application of Cement Lining to Steel Tubular Goods, Handling, Installation and Joining</i></p> <p><i>API RP 10F, Recommended Practice for Performance Testing of Cementing Float Equipment</i></p> <p><i>API RP 13B1, Recommended Practice for Field Testing Water-based Drilling Fluids</i></p> <p><i>API RP 13B2, Recommended Practice for Field Testing Oil-based Drilling Fluids</i></p> <p><i>API RP 13E, Recommended Practice for Shale Shaker Screen Cloth Designation</i></p> <p><i>API RP 13G, Recommended Practice Standard Procedure for Drilling Mud Report Form</i></p> <p><i>API RP 13I, Laboratory Testing of Drilling Fluids</i></p> <p><i>API RP 13J, Testing of Heavy Brines</i></p> |

| Measure | API Standards Referenced |
|---|--|
| Regulation No. 2/2020 on Petroleum Operations (cont.) | <p><i>API RP 13K, Chemical Analysis of Barite</i></p> <p><i>API RP 14H, Recommended Practice for Installation, Maintenance and Repair of Surface Safety Valves and Underwater Safety Valves Offshore</i></p> <p><i>API RP 16E, Recommended Practice for Design of Control Systems for Drilling Well Control Equipment</i></p> <p><i>API RP 49, Recommended Practice for Drilling and Well Servicing Operations</i></p> <p><i>API RP 53, Recommended Practices for Blowout Prevention Equipment Systems for Drilling Wells</i></p> <p><i>API RP 54, Occupational Safety and Health for Oil and Gas Well Drilling and Servicing Operations</i></p> <p><i>API RP 57, Recommended Practices for Offshore Well Completion, Servicing, Workover, and Plug and Abandonment Operations</i></p> <p><i>API RP 500, Electrical Classification</i></p> <p><i>API SPEC 1B, Oil-Field V-Belt</i></p> <p><i>API SPEC 2B, Fabrication of Structural Steel Pipe</i></p> <p><i>API SPEC 2C, Offshore Pedestal-mounted Cranes</i></p> <p><i>API SPEC 2F, Mooring Chain</i></p> <p><i>API SPEC 2W, Steel Plates for Offshore Structures</i></p> <p><i>API SPEC 2Y, Steel Plates, Quenched-and-Tempered, for Offshore Structures</i></p> <p><i>API SPEC 4E and 4F, Drilling & Well Servicing Structures</i></p> <p><i>API SPEC 5B, Threading, Gauging, and Inspection of Casing, Tubing, and Line Pipe Threads</i></p> <p><i>API SPEC 5CT, Casing and Tubing</i></p> <p><i>API SPEC 5CTM, Specification for Casing and Tubing (Metric Units)</i></p> <p><i>API SPEC 5D, Drill Pipe</i></p> <p><i>API SPEC 6A, Wellhead and Christmas Tree Equipment</i></p> |

| Measure | API Standards Referenced |
|---|---|
| Regulation No. 2/2020 on Petroleum Operations (cont.) | <p><i>API SPEC 6D, Valves</i></p> <p><i>API SPEC 6FA, Fire Test for Valves</i></p> <p><i>API SPEC 6FB, Fire Test for End Connections</i></p> <p><i>API SPEC 6FC, Fire Test for Valves with Automatic Backseats</i></p> <p><i>API SPEC 7B11C, Internal- Combustion Reciprocating Engines for Oil-Field Service</i></p> <p><i>API SPEC 7F, Oil Field Chain and Sprockets</i></p> <p><i>API SPEC 7J, Rotary Drill Stem Elements</i></p> <p><i>API SPEC 8A and 8C, Drilling and Production Hoisting Equipment,</i></p> <p><i>API SPEC 9A, Wire Rope</i></p> <p><i>API SPEC 10 and 10A, Cements and Materials for Well Cementing</i></p> <p><i>API SPEC 10D, Casing Bow-spring Centralizers</i></p> <p><i>API SPEC 13A, Drilling Fluids Materials</i></p> <p><i>API SPEC 14A, Subsurface Safety Valve Equipment</i></p> <p><i>API SPEC 14D, Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service</i></p> <p><i>API SPEC 15AR, Fiberglass Casing and Tubing</i></p> <p><i>API SPEC 16C, Choke and Kill Equipment</i></p> <p><i>API SPEC 16D, Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment</i></p> <p><i>API SPEC 17D, Subsea Wellhead and Tree Equipment</i></p> <p><i>API BULL 5C2, Bulletin on Performance Properties of Casing, Tubing, and Drill Pipe</i></p> <p><i>API BULL 5C3, Bulletin on Formulas and Calculations for Casing, Tubing, Drill Pipe, and Line Pipe Properties</i></p> <p><i>API BULL 5C4, Bulletin on Round Thread Casing Joint Strength with Combined Internal Pressure and Bending</i></p> |

GHANA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

Policies for the oil and gas sector in Ghana are set by the **Ministry of Petroleum**, while day-to-day upstream operations are regulated chiefly by the **Petroleum Commission**. The Commission administers rules and licenses for oil and gas development, as well as the local content requirements applicable to the sector.

Additionally, the **Environmental Protection Agency (EPA)** plays a role in managing the environmental impacts of upstream operations, and sits on the governing board of the Petroleum Commission. For the downstream sector, the **National Petroleum Authority (NPA)** regulates refining, storage, and transport of oil and gas.

All upstream oil and gas operations are also required to include participation by the state-owned **Ghana National Petroleum Corporation (GNPC)**, which works with private contractors through contractual agreements referred to as Petroleum Agreements. As in many countries, the GNPC plays a de facto regulatory role in shaping upstream oil and gas development through these agreements.

The national laws governing upstream and downstream oil and gas sectors, namely the *Petroleum (Exploration and Production) Act (2016)* and *Ghana National Petroleum Corporation Law (1983)* for the upstream sector, and the *Petroleum Commission Act* for the downstream sector, require compliance with oil and gas standards aligned with global best practices.

Under these laws, the **Ghana Standards Authority (GSA)**, formerly the Ghana Standards Board, is the country's national standards body, is charged with working closely with the Petroleum Commission and the NPA to develop and issue standards and certifications for the oil and gas sector. The GSA has issued at least 18 national standards covering petroleum and petroleum products.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Many of the regulations governing oil and gas in Ghana do not reference specific international standards by name. However, the Guidelines to Petroleum (Exploration & Production) Measurement Regulation (L.I. 2246) references nine chapters of the API Manual of Petroleum Measurement Standards, including:

- API MPMS Chapter 1
- API MPMS Chapter 4
- API MPMS Chapter 5
- API MPMS Chapter 7
- API MPMS Chapter 8
- API MPMS Chapter 11
- API MPMS Chapter 12
- API MPMS Chapter 13
- API MPMS Chapter 20

In addition, the Natural Gas Pipeline Safety (Construction, Operation And Maintenance) Regulations, 2012 (L.I. 2189) references API SPEC 5L, Line Pipe.

Finally, the *West African Gas Pipeline Regulations, 2005 (L.I. 1814)*, which covers construction and operation of the West African Gas Pipeline, a key pipeline that brings gas from Nigeria to Ghana, refer to nine API standards, including:

- *API 6D, Pipeline and Piping Valves*
- *API 5L, Line Pipe*
- *API 616, Gas Turbines for Petroleum, Chemical, and Gas Industry Services*
- *API 617, Axial and Centrifugal Compressors and Expander-compressors*
- *API RP 5L1, Railroad Transportation of Line Pipe*
- *API RP 5LW, Transportation of Line Pipe on Barges and Marine Vessels*
- *API 1104, Welding Pipelines and Related Facilities*
- *API RP 1102, Steel Pipelines Crossing Railroads and Highways*
- *API RP 1111, Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines*

NIGERIA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

Nigeria's **Federal Ministry of Petroleum Resources (FMPR)** sets policies and regulates the entire natural gas and oil sector. The recently passed Petroleum Industry Act (PIA) 2021 sets the framework for oil and gas regulation, and divides the responsibility for day-to-day supervision between the **Nigerian Upstream Petroleum Regulatory Commission (NUPRC)** and the Nigerian Midstream and **Downstream Petroleum Regulatory Authority (NMDPRA)**, which regulate and set standards for their corresponding sectors. The PIA also replaces the former Nigerian National Petroleum Corporation with **NNPC Limited**, providing it with a greater degree of commercial independence, though it will remain owned by the government.

On environmental and public safety issues, the **National Oil Spill Detection and Response Agency (NOSDRA)** oversees and coordinates plans to prevent, detect, and address oil spillages according to existing environmental laws, supported by the Federal Ministry of the Environment (FME). Nigeria also has a government agency, the **Nigerian Content Development and Monitoring Board (NCDMB)**, devoted to ensuring that domestic constituencies are given adequate priority in terms of contracts, employment, and goods and services used in the sector.

In 2017, the **Federal Executive Council of Nigeria**, consisting of the President and his ministers, adopted the National Petroleum Policy (NPP), a national policy plan for how hydrocarbons can be “used as a fuel for national economic growth.” Section 5.2.11 of the NPP covering technical standards states that “Nigeria will adopt appropriate international standards selected, whichever is more stringent, from ISO, ASME, EI, API, ASTM, [and] ANSI, for example.”

Standards development in Nigeria is coordinated by the **Standards Organization of Nigeria (SON)**, a governmental agency administrated by the **Standards Council of Nigeria**. SON conducts its standards development work through technical committees consisting of government officials, companies and industry groups, civil society, academics, and other experts. It has developed over 1,300 national standards, including some in the natural gas and oil sector.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

The Mineral Oils (Safety) Regulations of 1997 require that in the design and construction or modification of a major facility for natural gas and oil operations, a licensed operator should carry out comprehensive risk analysis in accordance with API recommended practices, which could include the following:

- *API RP 75, Development Of A Safety And Environmental Management Program For Offshore Operations And Facilities*
- *API RP 76, Contractor Safety Management For Oil And Gas Drilling And Production Operations*

The Mineral Oils (Safety) Regulations also require that installation of electrical equipment comply with *API RP 500, Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division I and Division 2*.

Additionally, SON has adopted at least 10 API Standards as national standards, including:

- *API RP 50:2013, Natural Gas Processing Plant Practices For Protecting the Environment*
- *API RP 520:2014, Sizing, Selection, and Installation of Pressure-relieving Devices in Refineries*
- *API RP 520 P2:2015, Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries, Part II—Installation*
- *API 553:2012, Refinery Valves and Accessories for Control and Safety Instrumented Systems*
- *API 554-1:2007, Process Control Systems Part 1-Process Control Systems Functions and Functional Specification Development*
- *API 610:2011, Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries*

- *API 2000:2014, Venting Atmospheric and Low-Pressure Storage Tanks*
- *API SPEC 12D:2008, Field Welded Tanks for Storage of Production Liquids*
- *API SPEC 12F:2008, Shop Welded Tanks for Storage of Production Liquids*
- *API SPEC 12L:2008, Vertical and Horizontal Emulsion Treaters*

Furthermore, NUPRC (and its former incarnation, the Department of Petroleum Resources) has issued guidelines governing aspects of natural gas and oil operations (many of which are mandatory) that include 43 references to API standards.

| Guidelines | API Standards Referenced |
|---|--|
| Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (1991) | <p><i>API RP 45, Recommended Practice for Analysis of Oilfield Waters</i></p> <p><i>API RP 10, Recommended Practice for Testing Well Cements</i></p> <p><i>API RP 57, Offshore Well Completion, Servicing, Workover, and Plug and Abandonment Operations</i></p> |
| Procedure Guide for the Construction and Maintenance of Fixed Offshore Platforms (1992) | <p><i>API RP 2A, Planning, Designing, and Constructing Fixed Offshore. Platforms—Working Stress Design</i></p> <p><i>API RP 14C, Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms</i></p> <p><i>API 1104, Standard for Welding Pipelines and Related Facilities</i></p> |
| Procedure Guide for the Design and Construction of Oil and Gas Surface Production Facilities (2001) | <p><i>API RP 2A, Planning, Designing, and Constructing Fixed Offshore. Platforms—Working Stress Design</i></p> <p><i>API RP 14C, Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms</i></p> <p><i>API RP 520, Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries</i></p> <p><i>API RP 1104, Welding of Pipelines and Related Facilities</i></p> |
| Guidelines for the Establishment of Hydrocarbon Processing (Petroleum Refinery and Petrochemicals) Plants in Nigeria (2008) | <p><i>API 2510, Design and Construction of LPG Installations</i></p> <p><i>API 520, Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries</i></p> <p><i>API 521, Pressure-relieving and Depressuring Systems</i></p> <p><i>API 550, Manual on Installation of Refinery Instruments and Control Systems</i></p> <p><i>API 1104, Standard for Welding Pipelines and Related Facilities</i></p> |

| Guidelines | API Standards Referenced |
|---|--|
| Guidelines for the Procedure for Lifting Equipment and Lifting Operations (2020) | <i>API RP 2D, Operation and Maintenance of Offshore Cranes</i> |
| Guidelines for Compliance with Technical Safety Control (TSC) Requirements for Facility Development Projects and Modifications (2020) | <p><i>API RP 14C, Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms</i></p> <p><i>API RP 14J, Recommended Practice for Design and Hazards Analysis for Offshore Production Facilities</i></p> <p><i>API RP 75, Recommended Practice for a Safety and Environmental Management System for Offshore Operations and Assets</i></p> <p><i>API RP 500, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2</i></p> |
| Guidelines for the Implementation of Risk-Based Inspections (2020) | <p><i>API RP 510, Inspection, Rating, and Repair of Pressure Vessels in Petroleum Refinery Service</i></p> <p><i>API 570, Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems</i></p> <p><i>API RP 571, Damage Mechanisms Affecting Fixed Equipment in the Refining Industry</i></p> <p><i>API RP 572, Inspection of Pressure Vessels</i></p> <p><i>API RP 576, Inspection of Pressure-Relieving Devices</i></p> <p><i>API RP 580, Risk-based Inspection</i></p> <p><i>API RP 581, Risk-Based Inspection Methodology</i></p> <p><i>API RP 653, Tank Inspection, Repair, Alteration, and Reconstruction</i></p> |
| Procedure Guide for the Determination of the Quantity and Quality of Petroleum and Petroleum Products in Nigeria (2019) | <p><i>API MPMS Chapter 3 – Tank Gauging</i></p> <p><i>API MPMS Chapter 7 – Temperature Determination</i></p> <p><i>API MPMS Chapter 8.1 Manual Sampling of Petroleum Products</i></p> <p><i>API MPMS Chapter 8.2 Automatic Sampling of Petroleum Products</i></p> <p><i>API MPMS Chapter 9 – Density Determination</i></p> <p><i>API MPMS Chapter 10 – Sediment and Water</i></p> <p><i>API MPMS Chapter 14.3 –Orifice metering of natural gas and other related hydrocarbon fluids</i></p> |

| Guidelines | API Standards Referenced |
|---|---|
| Procedures and Conditions for the Construction, Installation, Modification, Relocation and Operation of LPG Facilities (2019) | <i>API 2510, Design and Construction of Liquefied Petroleum Gas Installations (LPG)</i> |
| Guidelines for the Design, Construction, Operation, and Maintenance of Oil and Gas Pipeline Systems in Nigeria (2021) | <p><i>API SPEC 5L, Line Pipe</i></p> <p><i>API SPEC 5B, Threading, Gauging, and Inspection of Casing, Tubing, and Line Pipe Threads</i></p> <p><i>API STD 1104, Welding Pipelines and Related Facilities</i></p> <p><i>API RP 1102, Steel Pipelines Crossing Railroads and Highways</i></p> <p><i>API RP 1111, Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines</i></p> <p><i>API RP 1160, Managing System Integrity for Hazardous Liquid Pipelines</i></p> <p><i>API STD 2RD, Design of Risers for Floating Production Systems (FPSs) and Tension-Leg Platforms (TLPs)</i></p> |

SOUTH AFRICA

REGULATORY OVERVIEW AND STANDARDS FRAMEWORK

The **National Department of Minerals and Energy** and the **Petroleum Agency of South Africa** limited are the principle bodies that oversee national oil and gas extraction. The **Department of Environment, Forestry, and Fisheries (DEFF)** regulates environmental concerns related to oil and gas extraction. The Petroleum Agency monitors compliance, provides an advisory and administrative role for administering petroleum rights and permits, and operates the national petroleum and exploration and production database.

The National Department of Minerals and Energy administers the Mineral and Petroleum Resources Development Act of 2002 (MPRDA), which must be read in conjunction with the Constitution of South Africa, the National Environmental Management Act of 1998 (NEMA), the Income Tax Act of 1962 (ITA), the Value Added Tax Act of 1991, the Mining Titles Registration Act of 1967, and the Mineral and Petroleum Resources Royalty Act of 2008. The MPRDA governs the exploration and production of petroleum resources and is the primary legislation for regulating petroleum. The Petroleum Production Act of 1977 lays out additional specifications and standards for petroleum products that may be sold for consumption in South Africa.

For downstream transport and storage of oil and gas, including for pipelines and storage facilities, the **National Energy Regulator of South Africa** grants permits and licenses.

The specifications and standards used in South Africa conform to the South African National Standards (SANS) laid out by the South Africa Bureau of Standards (SABS), which is a member of the International Organization for Standardization (ISO). SABS is a statutory body, which operates within the Standards Act of 2008 as well as the Standardization Institution of South Africa, and is mandated to develop, promote and maintain SANS. SABS promotes quality in connection with commodities, products and services, and renders conformity assessment services.

In 2021, the Upstream Petroleum Resources Development Bill (UPRD Bill) was introduced, signifying a possible transition in the South African oil and gas regulatory landscape, by aiming to separate the regulation of upstream petroleum production from the mining sector.

USES AND REFERENCES TO API AND OTHER INTERNATIONAL STANDARDS

Standards issued by SABS for the oil and gas sector are in line with the ISO, which develop voluntary, consensus-based, and market relevant international standards. Five standards reference a total of 8 API standards, listed below:

| | |
|---|----------------------------------|
| SANS 1843:2019 High Performance Engine Lubricating Oil for Diesel Engines | <i>API Service Category CJ-4</i> |
| SANS 1842:2018 High Performance Engine Lubricating Oil for Petrol Engines | <i>API Service Category SM</i> |
| SANS 1517:2019 High Performance Engine Lubricating Oil for Diesel Engines | <i>API Service Category CI-4</i> |

| | |
|---|---|
| SANS 1516:2018 High Performance Engine Lubricating Oil for Petrol Engines | <i>API Service Category SL</i> |
| SANS 10141:2004 Above Ground Storage Tanks for Petroleum Products | <i>API SPEC 5L, Line Pipe</i> <i>API 650, Welded steel tanks for oil storage</i> <i>API 653, Tank inspection, repair, alteration, and reconstruction.</i> <i>API 2000, Venting atmospheric and low-pressure storage tanks – Nonrefrigerated and refrigerated</i> |



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