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## UPSTREAM SAFETY STANDARDS

### API HF1

#### Hydraulic Fracturing Operations—Well Construction and Integrity Guidelines

Provides guidance and highlight industry recommended practices for well construction and integrity for wells that will be hydraulically fractured. The guidance provided here will help to ensure that shallow groundwater aquifers and the environment will be protected, while also enabling economically viable development of oil and natural gas resources. This document is intended to apply equally to wells in either vertical, directional, or horizontal configurations. Maintaining well integrity is a key design principle and design feature of all oil and gas production wells. Maintaining well integrity is essential for the two following reasons.

- To isolate the internal conduit of the well from the surface and subsurface environment. This is critical in protecting the environment, including the groundwater, and in enabling well drilling and production.
- To isolate and contain the well's produced fluid to a production conduit within the well.

Although there is some variability in the details of well construction because of varying geologic, environmental, and operational settings, the basic practices in constructing a reliable well are similar. These practices are the result of operators gaining knowledge based on years of experience and technology development and improvement. These experiences and practices are communicated and shared via academic training, professional and trade associations, extensive literature and documents, and very importantly, industry standards and recommended practices. Pages: 24

1st Edition | October 2009 | Product Number: GHF101 | Price: \$42.00

You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

### API HF2

#### Water Management Associated with Hydraulic Fracturing

Identifies and describes many of the current industry best practices used to minimize environmental and societal impacts associated with the acquisition, use, management, treatment, and disposal of water and other fluids associated with the process of hydraulic fracturing. While this document focuses primarily on issues associated with hydraulic fracturing pursued in deep shale gas development, it also describes the important distinctions related to hydraulic fracturing in other applications. Moreover, this guidance document focuses on areas associated with the water used for purposes of hydraulic fracturing and does not address other water management issues and considerations associated with oil and gas exploration, drilling, and production. These topics will be addressed in future API documents. Pages: 26

1st Edition | June 2010 | Product Number: GHF201 | Price: \$42.00

You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

### API HF3

#### Practices for Mitigating Surface Impacts Associated with Hydraulic Fracturing

Identifies and describes practices currently used in the oil and natural gas industry to minimize surface environmental impacts—potential impacts on surface water, soils, wildlife, other surface ecosystems, and nearby communities—associated with hydraulic fracturing operations. While this

document focuses primarily on issues associated with operations in deep shale gas developments, it also describes the important distinctions related to hydraulic fracturing in other applications. Pages: 18

1st Edition | January 2011 | Product Number: GHF301 | Price: 42.00

You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

### RP 49

#### Recommended Practice for Drilling and Well Service Operations Involving Hydrogen Sulfide

Provides recommendations that apply to oil and gas well drilling and servicing operations involving hydrogen sulfide. These operations include well drilling, completion, servicing, workover, downhole maintenance, and plug and abandonment procedures conducted with hydrogen sulfide present in the fluids being handled. Coverage of this publication is applicable to operations confined to the original wellbore or original total depth and applies to the selection of materials for installation or use in the well and in the well drilling or servicing operation(s). The presence of hydrogen sulfide in these operations also presents the possibility of exposure to sulfur dioxide from the combustion of hydrogen sulfide. Pages: 29

3rd Edition | May 2001 | Reaffirmed: January 2013

Product Number: G49003 | Price: \$88.00

### RP 49 \*

#### Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide—Kazakh

Kazakh translation of RP 49.

3rd Edition | May 2001 | Product Number: G4903K | Price: \$71.00

### RP 49 \*

#### Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide—Russian

Russian translation of RP 49.

3rd Edition | May 2001 | Product Number: G04903R | Price: \$68.00

### RP 51R

#### Environmental Protection for Onshore Oil and Gas Production Operations and Leases

Provides environmentally sound practices, including reclamation guidelines, for domestic onshore oil and gas production operations. It is intended to be applicable to contractors as well as operators. Facilities within the scope of this document include all production facilities, including produced water handling facilities. Offshore and arctic areas are beyond the scope of this document. Operational coverage begins with the design and construction of access roads and well locations and includes reclamation, abandonment, and restoration operations. Gas compression for transmission purposes or production operations, such as gas lift, pressure maintenance, or enhanced oil recovery (EOR), is included. Annex A provides guidance for a company to consider as a “good neighbor.” Pages: 35

1st Edition | July 2009 | Reaffirmed: December 2015

Product Number: G51R01 | Price: \$76.00

You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

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# Safety and Fire Protection

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## RP 54

### Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations

Includes procedures for promotion and maintenance of safe working conditions for employees engaged in rotary drilling operations and well servicing operations, including special services. Applies to rotary drilling rigs, well servicing rigs, and special services as they relate to operations on locations. Pages: 35

3rd Edition | August 1999 | Reaffirmed: January 2013

Product Number: G54003 | Price: \$125.00

## RP 54 \*

### Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations—Kazakh

Kazakh translation of RP 54.

3rd Edition | August 1999 | Product Number: G54003K | Price: \$100.00

## RP 54 \*

### Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations—Russian

Russian translation of RP 54.

3rd Edition | August 1999 | Product Number: G54003R | Price: \$100.00

## RP 55

### Recommended Practice for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide

Covers recommendations for protection of employees and the public, as well as conducting oil and gas producing and gas processing plant operations where hydrogen sulfide is present in the fluids being produced. Pages: 40

2nd Edition | February 1995 | Reaffirmed: March 2007

Product Number: G55002 | Price: \$115.00

## Std 65-2 ♦

### Isolating Potential Flow Zones During Well Construction

Contains best practices for zone isolation in wells to prevent annular pressure and/or flow through or past pressure-containment barriers that are installed and verified during well construction. Well construction practices that may affect barrier sealing performance are mentioned along with methods to help ensure positive effects or to minimize any negative ones. The objectives of this guideline are two-fold. The first is to help prevent and/or control flows just prior to, during, and after primary cementing operations to install or “set” casing and liner pipe strings in wells. The second objective is to help prevent sustained casing pressure (SCP). The guidance from this document covers recommendations for pressure-containment barrier design and installation and well construction practices that affect the zone isolation process to prevent or mitigate annular fluid flow or pressure. Pages: 83

2nd Edition | December 2010 | | Reaffirmed: November 2016

Product Number: G65202 | Price: \$130.00

You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

## RP 67

### Recommended Practice for Oilfield Explosives Safety

Applies to explosives used in oil and gas well operations, more specifically, explosives used inside the wellbore. Guidance is provided for explosives transportation, on-site explosives loading and unloading operations, electrical wireline operations, tubing conveyed operations, self-contained activating tools, setting tools, sidewall sample taker tools, select fire perforating guns, and bullet perforating guns. Recommendations are presented regarding surface equipment and downhole equipment.

Recommended training and minimum qualifications are presented for personnel who participate in handling and using explosives at the well site. Pages: 18

2nd Edition | May 2007 | Reaffirmed: January 2015

Product Number: G06702 | Price: \$85.00

## RP 67 \*

### Recommended Practice for Oilfield Explosives Safety—Kazakh

Kazakh translation of RP 67.

2nd Edition | May 2007 | Product Number: G06702K | Price: \$68.00

## RP 67 \*

### Recommended Practice for Oilfield Explosives Safety—Russian

Russian translation of RP 67.

2nd Edition | May 2007 | Product Number: G06702R | Price: \$69.00

## RP 74

### Recommended Practice for Occupational Safety for Onshore Oil and Gas Production Operation

Recommends practices and procedures for promoting and maintaining safe working conditions for personnel engaged in onshore oil and gas production operations, including special services. Pages: 23

1st Edition | October 2001 | Reaffirmed: January 2013

Product Number: G74001 | Price: \$61.00

## RP 75

### Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities

Provides guidance for use in preparing safety and environmental management programs (SEMP) for oil, gas, and sulphur operations and facilities located on the outer continental shelf (OCS). These guidelines are applicable to well drilling, servicing, and production; and pipeline facilities and operations that have the potential for creating a safety or environmental hazard at OCS platform sites. Eleven major program elements are included for application to these facilities and operations. Identification and management of safety and environmental hazards are addressed in design, construction, startup, operation, inspection, and maintenance of new, existing, and modified facilities. Pages: 41

3rd Edition | May 2004 | Reaffirmed: April 2013

Product Number: G07503 | Price: \$89.00

## RP 75 \*

### Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities—Chinese

Chinese translation of RP 75.

3rd Edition | May 2004 | Product Number: G07503C | Price: \$63.00

## 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

Provides general information and guidance for the development of a safety and environmental management system (SEMS) for onshore oil and natural gas operations, including drilling, production, and well servicing activities. Although there is an extensive amount of information that has been developed on the topic of safety and environmental management systems, this document focuses on this industry sector to help foster continuous improvement in our industry's safety and environmental performance. It is recognized that many onshore oil and natural gas companies have effective

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SEMS in place; however, the intent of this document is to provide an additional tool that can assist these and especially other operators in taking the next step toward implementing a complete system at a pace that complements their business plan. For those who already have a mature SEMS in place, this document can be used for continuous improvement of the system. Pages: 12

1st Edition | November 2007 | Product Number: G75L01 | Price: \$34.00

## RP 76

### Contractor Safety Management for Oil and Gas Drilling and Production Operations

Intended to assist operators, contractors, and subcontractors (third parties) in the implementation of a contractor safety program and improve the overall safety performance while preserving the independent contractor relationship. It is intended for the Upstream Segment of the petroleum industry; however, since the operator requirements and the contracted work are diverse, this publication may not be applicable to all operations at each company or to all contract work performed in those operations. Many oil and gas exploration and production companies contract for equipment and personnel services for a wide range of activities, including drilling production, well servicing, equipment repair, maintenance, and construction. Certain activities of contractors have the potential to take place either contractor and/or operator personnel and/or equipment at risk. It is important that operations are carried out in a safe manner. Operators and contractors need to provide safe work places and to protect the safety of their work places and to protect the safety of their workforces and the general public. When they work together to improve safety, both benefit. Pages: 60

2nd Edition | November 2007 | Reaffirmed: January 2013

Product Number: G07602 | Price: \$57.00

## MULTI-SEGMENT PUBLICATIONS

### Human Factors in New Facility Design Tool

Describes a human factors tool that may be used by operating plants as an aid to incorporate human factors principles in the design of equipment that will be operated and maintained by people.

The human factors principles described in this document are intended for new equipment designs; however, many ideas provided in this tool may be used to improve the operating of existing plants where feasible.

This document focuses only on equipment design. Items such as human error, behavior-based safety, and operating procedure issues are not in the scope.

The tool covers equipment that is common to both upstream producing and downstream manufacturing operations. Equipment associated with specific activities such as drilling rigs is not specifically addressed. Pages: 71

2nd Edition | October 2005 | Product Number: IOHF02 | Price: \$149.00

### Human Factors Tool for Existing Operations

Objectives of this tool include the following:

- provide a tool for operating crews to identify opportunities for latent conditions and human error, and
- improve how process hazards analysis/hazard evaluation/revalidation process address human factors.

The scope of this tool includes existing operations and equipment and human tasks.

This tool is intended for use without specific training on human factors. This is a simple process for gathering a few operators and mechanics who are familiar with the equipment/process and who are qualified to identify where traps (latent conditions) in the equipment and tasks (error likely scenarios) exist that make it easy for people to do something wrong. Pages: 14

1st Edition | February 2006 | Product Number: IOHF03 | Price: \$62.00

## RP 752

### Management of Hazards Associated with Location of Process Plant Permanent Buildings

Provides guidance for managing the risk from explosions, fires and toxic material releases to on-site personnel located in new and existing buildings intended for occupancy. This RP was developed for use at refineries, petrochemical and chemical operations, natural gas liquids extraction plants, natural gas liquefaction plants, and other onshore facilities covered by the OSHA Process Safety Management of Highly Hazardous Chemicals, 29 CFR 1910.119.

Buildings covered by this RP are rigid structures intended for permanent use in fixed locations. Tents, fabric enclosures and other soft-sided structures are outside the scope of this document. This 3rd Edition of RP 752:2009 supersedes all previous editions, including the technical data provided in those documents.

Significant research and development of technology pertinent to building siting evaluations has been performed since the publication of the previous editions of RP 752. Examples of updated technology include prediction of blast damage to buildings, determination of occupant vulnerabilities, and estimates of event frequencies. Prior versions of RP 752 and the technical data included in them should not be used for building siting evaluations. The 2nd Edition of RP 752 covered all building types both permanent and portable. This 3rd Edition of RP 752 does not cover portable buildings. Portable buildings are now covered by RP 753. It is recognized, however, that portable buildings specifically designed for significant blast load represent a potential area of overlap between RP 753 and RP 752. In accordance with 1.3 of this document:

“Buildings described in API RP 753, Management of Hazards Associated with Location of Process Plant Portable Buildings, First Edition, June 2007, as ‘portable buildings specifically designed to resist significant blast loads’ and intended for permanent use in a fixed location are covered in this document (API RP 752). All other portable buildings are covered by API RP 753.” Pages: 27

3rd Edition | December 2009 | Product Number: K75203 | Price: \$141.00

## RP 753

### Management of Hazards Associated with Location of Process Plant Portable Buildings

Provides guidance for reducing the risk to personnel located in portable buildings from potential explosion, fire and toxic release hazards. While occupied permanent buildings (e.g. control rooms, operator shelters) located near covered process area are typically constructed to be blast and fire resistant, conventional portable buildings (i.e. light wood trailers) are typically not constructed to be blast and fire resistant. Past explosion accidents have demonstrated that occupants of conventional portable buildings are susceptible to injuries from structural failures, building collapse, and building debris and projectiles.

Guidance is provided based on the following principles.

- Locate personnel away from covered process areas consistent with safe and effective operations.
- Minimize the use of occupied portable buildings in close proximity to covered process areas.
- Manage the occupancy of portable building especially during periods of increased risk including unit start up or planned shut-down operations.
- Design, construct, install, and maintain occupied portable buildings to protect occupants against potential hazards.
- Manage the use of portable buildings as an integral part of the design, construction, and maintenance operation of a facility. Pages: 22

1st Edition | June 2007 | Reaffirmed: January 2012

Product Number: K75301 | Price: \$141.00

# Safety and Fire Protection

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## RP 754 ■

### Process Safety Performance Indicators for the Refining and Petrochemical Industries (ANSI/API RP 754)

Identifies leading and lagging process safety indicators useful for driving performance improvement. As a framework for measuring activity, status, or performance, this document classifies process safety indicators into four tiers of leading and lagging indicators. Tiers 1 and 2 are suitable for nationwide public reporting, and Tiers 3 and 4 are intended for internal use at individual facilities. Guidance on methods for development and use of performance indicators is also provided. This recommended practice (RP) was developed for the refining and petrochemical industries, but may also be applicable to other industries with operating systems and processes where loss of containment has the potential to cause harm. Applicability is not limited to those facilities covered by the OSHA Process Safety Management Standard, 29 CFR 1910.119, or similar national and international regulations. To enable consistent application of this RP to other refining and petrochemical industry sub segments, informative annexes have been created to define the Applicability and Process definition for those subsegments. The user would substitute the content of those annexes for the referenced sections of this RP: Annex A—Petroleum Pipeline and Terminal Operation, Annex B—Retail Service Stations, and Annex C—Oil and Gas Drilling and Production Operations. Performance indicators identified in this recommended practice are based on the following guiding principles.

- Indicators should drive process safety performance improvement and learning.
- Indicators should be relatively easy to implement and easily understood by all stakeholders (e.g. workers and the public).
- Indicators should be statistically valid at one or more of the following levels: industry, company, and facility. Statistical validity requires a consistent definition, a minimum data set size, a normalization factor, and a relatively consistent reporting pool.
- Indicators should be appropriate for industry, company, or facility level benchmarking. Pages: 118

2nd Edition | April 2016 | Product Number: K75402 | Price: \$150.00

## RP 755

### Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries (ANSI/API RP 755)

As a result of the U.S. Chemical Safety and Hazard Investigation Board (CSB) investigation of the 2005 BP Texas City incident, the CSB issued several recommendations including the development of an American National Standards Institute standard that develops fatigue prevention guidelines for the refining and petrochemical industries that, at a minimum, limit hours and days of work and address shift work.

Provides guidance to all stakeholders (e.g. employees, managers, supervisors) on understanding, recognizing, and managing fatigue in the workplace. Owners and operators should establish policies and procedures to meet the purpose of this document

Developed for refineries, petrochemical and chemical operations, natural gas liquefaction plants, and other facilities such as those covered by the OSHA Process Safety Management Standard, 29 CFR 1910.119. This document is intended to apply to a workforce that is commuting daily to a job location.

Applies to all employees working night shifts, rotating shifts, extended hours/days, or call outs involved in process safety sensitive actions. It should also be considered for others making process safety-sensitive decisions. On-site contractors involved in process safety sensitive actions shall have fatigue risk management systems equivalent to the criteria outlined in this document. Pages: 11

1st Edition | April 2010 | Product Number: K75501 | Price: \$83.00

## TR 755-1

### Technical Support Document for ANSI/API RP 755, *Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries*

Identifies and explains the scientific and operational issues considered during the preparation of RP 755. By providing the reasoning behind the specific wording in the RP 755 document, this document supports each key statement in RP 755 in sequence so that it can be used in parallel with the RP 755 text. To make this document accessible and manageable, key scientific sources and references are provided to help readers gain access to the scientific literature.

Fatigue Risk Management Systems (FRMS) have emerged and been widely recognized as a more effective approach to managing and mitigating employee fatigue risk in the 24/7 workplace. The core feature of the FRMS is that it is a data-driven, risk-informed, safety performance-based system. The FRMS implementation process first identifies all sources of fatigue risk in the business operation, then introduces mitigating policies, technologies, and procedures to reduce the risk, and most importantly then maintains them in a proactively managed continuous improvement system. The history of FRMS was recently summarized.

This method represents a significant step change from the traditional approaches of either relying on maximum limits to hours of work or minimum limits to hours of rest (variously called Hours of Service, Work-Rest Rules, Working Time Directives), or adopting intermittent or piece-meal solutions (e.g. a fatigue training program or a shift schedule redesign), depending on the interests and initiative of local site managers.

One essential feature of FRMS is that it is a system meant to be improved upon on a regular and continuous basis. It is not a set of guidelines designed for one-time compliance but instead provides a framework that will evolve over time, driven by the collection of data on fatigue risk and fatigue outcomes (e.g. fatigue-related incidents). Pages: 49

1st Edition | April 2010 | Product Number: K755101 | Price: \$103.00

## RP 756

### Management of Hazards Associated with Location of Process Plant Tents

Provides guidance for managing the risk from explosions, fires and toxic material releases to on-site personnel located in tents. The term "tent" is used to describe a wide range of structures and is defined in §3.15. This RP was developed for use at refineries, petrochemical and chemical operations, natural gas liquids extraction plants, natural gas liquefaction plants, and other onshore facilities covered by OSHA 29 CFR 1910.119. The focus of this RP is primarily on process related hazards. However, non-process related hazards may exist that could present risks to tent occupants. Previous accidents have demonstrated that tent occupants are susceptible to injuries from fires originating inside the tent, from tent collapse due to extreme weather, and from falling objects. Some of these hazards are addressed by tent design standards, manufacturer's recommendations, and local regulations. Pages: 25

1st Edition | September 2014 | Product Number: C75601 | Price: \$125.00

## TR 756-1

### Process Plant Tent Responses to Vapor Cloud Explosions—Results of the American Petroleum Institute Tent Testing Program

Beginning in 2011, the American Petroleum Institute (API) performed vapor cloud explosion (VCE) tests to determine the response of tents to the potential explosion hazards that may be present at refineries, petrochemical and chemical operations, natural gas and other onshore process facilities covered by OSHA 29 CFR 1910.119. The testing was conducted to provide data for use by the API committee developing RP 756. This publication, TR 756-1, contains information on the results of the API tent testing program. Pages: 597

1st Edition | September 2014 | Product Number: C756101 | Price: \$190.00

## Publ 770

### A Manager's Guide to Reducing Human Errors—Improving Human Performance in the Process Industries

Intended for an audience of middle managers to senior executives who have different levels of knowledge about human factors engineering. It is designed to equip them with a basic understanding of the causes of human errors and to suggest ways for reducing human errors at individual facilities. It also describes how to incorporate human reliability analysis (HRA) into process safety management activities. Pages: 85

1st Edition | March 2001 | Product Number: K77001 | Price: \$76.00

## Std 780

### Security Risk Assessment Methodology for the Petroleum and Petrochemical Industries

Prepared by a Security Risk Assessment (SRA) Committee of the American Petroleum Institute (API) to assist the petroleum and petrochemical industries in understanding security risk assessment and in conducting SRAs. The standard describes the recommended approach for assessing security risk widely applicable to the types of facilities operated by the industry and the security issues the industry faces. The standard is intended for those responsible for conducting security risk assessments and managing security at these facilities. The method described in this standard is widely applicable to a full spectrum of security issues from theft to insider sabotage to terrorism. The API SRA Methodology was developed for the petroleum and petrochemical industry, for a broad variety of both fixed and mobile applications. This recommended practice describes a single methodology, rather than a general framework for SRAs, but the methodology is flexible and adaptable to the needs of the user. This methodology constitutes one approach for assessing security vulnerabilities at petroleum and petrochemical industry facilities. However, there are other risk assessment techniques and methods available to industry, all of which share common risk assessment elements. Pages: 113

1st Edition | May 2013 | Product Number: K78001 | Price: \$190.00

## RP 2001

### Fire Protection in Refineries

Covers basic concepts of refinery fire protection. It reviews the chemistry and physics of refinery fires; discusses how the design of refinery systems and infrastructure impact the probability and consequences of potential fires; describes fire control and extinguishing systems typically used in refineries; examines fire protection concepts that should be covered in operating and maintenance practices and procedures; and provides information on organization and training for refinery emergency responders. Many of the concepts, systems and equipment discussed in this document are covered in detail in referenced publications, standard or governmental requirements. Pages: 75

9th Edition | April 2012 | Product Number: C200109 | Price: \$115.00

## RP 2003

### Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents

Presents the current state of knowledge and technology in the fields of static electricity, and stray currents applicable to the prevention of hydrocarbon ignition in the petroleum industry and is based on both scientific research and practical experience. The principles discussed in this recommended practice are applicable to other operations where ignitable liquids and gases are handled. Their use should lead to improved safety practices and evaluations of existing installations and procedures. Pages: 76

8th Edition | September 2015 | Product Number: K20038 | Price: \$190.00

## RP 2009

### Safe Welding, Cutting, and Hot Work Practices in the Petroleum and Petrochemical Industries

Provides guidelines for safely conducting welding, cutting or other hot work activities in refineries, gas plants, petrochemical plants, and other facilities in the petroleum and petrochemical industries. It provides specific guidance for evaluating procedures for certain types of work on equipment in service. It does not include guidance for compliance with regulations or codes; hot tapping; welding techniques, normal, "safe work" practices; or entry or work in inert environments. Pages: 23

7th Edition | February 2002 | Reaffirmed: March 2012

Product Number: K20097 | Price: \$79.00

## RP 2027

### Ignition Hazards Involved in Abrasive Blasting of Atmospheric Storage Tanks in Hydrocarbon Service

Identifies the ignition hazards involved in abrasive blasting of the exteriors of hydrocarbon storage tanks containing a mixture that is flammable or that can become flammable when air is added. It provides operational guidelines for procedures that significantly reduce ignition risks during abrasive blasting of hydrocarbon tanks that may contain a flammable vapor space. Pages: 4

3rd Edition | March 2002 | Reaffirmed: March 2012

Product Number: C20273 | Price: \$74.00

## RP 2028

### Flame Arresters in Piping Systems

Covers the use and limitations of flame arresters installed in piping systems in the petroleum and petrochemical industries. It provides a general overview of flame arresters currently in use and some potential concerns or limitations. Applicable combustion and flame propagation parameters are discussed including the distinction between arresting flames versus arresting detonations. Pages: 12

3rd Edition | February 2002 | Reaffirmed: December 2010

2-Year Extension: February 2015 | Product Number: K20283 | Price: \$59.00

## RP 2030

### Application of Fixed Water Spray Systems for Fire Protection in the Petroleum and Petrochemical Industries

Provides guidance for the petroleum industry and some petrochemical industry applications (for non-water-reactive petrochemicals with physical and combustion characteristics comparable to hydrocarbons) in determining where water spray systems might be used to provide protection from fire damage for equipment and structures. Pages: 21

4th Edition | September 2014 | Product Number: K20304 | Price: \$105.00

## RP 2201

### Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries

Provides information to assist in safely conducting hot tapping operations on equipment in service in the petroleum and petrochemical industries. No document can address all situations nor answer all potential questions; however, the understanding of potential hazards, and application of this knowledge, can help reduce the probability and severity of incidents. Pages: 27

5th Edition | June 2003 | Reaffirmed: October 2010

2-Year Extension: February 2015 | Product Number: K22015 | Price: \$86.00

## RP 2210

### Flame Arresters for Vents of Tanks Storing Petroleum Products

Discusses the benefits and detriments associated with the use of flame arresters on vents utilized on atmospheric fixed-roof tanks. Pages: 4

3rd Edition | June 2000 | Reaffirmed: March 2015

Product Number: K22103 | Price: \$65.00

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## RP 2216

### Ignition Risk of Hydrocarbon Vapors by Hot Surfaces in the Open Air

Provides information concerning the potential for ignition of hydrocarbons that are exposed to hot surfaces in the open air. Hydrocarbon liquids, when heated sufficiently, can ignite without the application of a flame or spark. The ignition of hydrocarbons by hot surfaces may occur when oil is released under pressure and sprays upon a hot surface or is spilled and lies upon a hot surface for a period of time. Understanding the mechanism and dynamics of auto-ignition is an important step in preventing or controlling the ignition of hydrocarbons by hot surfaces in the open air. In addition to the information provided herein, appropriate industry standards and other information may assist users to understand the potential hazards of hydrocarbon auto-ignition (such as spontaneous combustion) not specifically covered by this publication and implement appropriate prevention and control measures. Pages: 5

3rd Edition | December 2003 | Reaffirmed: October 2015

Product Number: K22163 | Price: \$59.00

## Std 2217A

### Guidelines for Safe Work in Inert Confined Spaces in the Petroleum and Petrochemical Industries

Provides guidelines for safely entering and working in and near confined spaces that have inert atmospheres and can aid employers in preparing specific procedures for working safely in inert confined spaces, recognizing that because of its unique nature, the hazards and requirements for inert entry are generally greater than for "normal" permit-required confined space (PRCS) entry. Std 2217A applies to confined spaces that have been intentionally purged with an inert gas until:

- the oxygen level in the vapor space is too low to support combustion, and
- any gases in or flowing out of the confined space are below flammable or reactive levels.

Typical inert entry work in the petroleum and petrochemical industry includes work to service or replace catalyst in reactors. Pages: 25

4th Edition | July 2009 | 2-Year Extension: February 2015

Product Number: K2217A4 | Price: \$88.00

## RP 2218

### Fireproofing Practices in Petroleum and Petrochemical Processing Plants

Intended to provide guidance for selecting, applying, and maintaining fireproofing systems designed to limit the extent of fire-related property loss from pool fires in the petroleum and petrochemical industries. Where comparable hazards exist, and to the extent appropriate, it may be applied to other facilities that could experience similar severe fire exposure and potential losses.

This RP identifies fireproofing needs for petroleum and petrochemical plants specifically focusing on property loss protection for pool fires scenarios in on-shore processing plants. Pages: 60

3rd Edition | July 2013 | Product Number: K22183 | Price: \$160.00

## RP 2219 ■

### Safe Operation of Vacuum Trucks Handling Flammable and Combustible Liquids in Petroleum Service

Provides information concerning the safe operation of vacuum trucks engaged in all aspects of handling flammable and combustible liquids, associated waste water, produced water, sour water, basic sediment and water (BS&W), caustics, spent acids, or other fluids stemming from petroleum operations, products, powders, and the hazard of dust explosions. This publication discusses the types of vacuum pumps and cargo tanks associated with vacuum truck operations, the common hazards associated with those vacuum truck operations, and representative safe work practices and precautions to help prevent accidents and injuries. Appendix G provides brief descriptions of a variety of incidents involving vacuum trucks, including

offloading into open areas. These may be useful in reviewing specific operating procedures or developing materials for safety meetings or pre-job briefings. Pages: 60

4th Edition | June 2016 | Product Number: K22194 | Price: \$165.00

## Std 2220

### Contractor Safety Performance Process

Assists owners and contractors in developing, improving, and maintaining their mutual safety programs. Widely diverse contractor functions and uses may include resident, non-resident, long-term, and short-term contractors. These have in common the need for effective safety programs to protect both owner and contractor personnel from workplace injury and illness, as well as from losses associated with incidents arising out of contractor work. This standard aims to help both owners and contractors improve the contractor's safety performance while preserving the independent contractor relationship. It was developed for the petroleum and petrochemical industries and the firms that perform contract work for them.

Contractors perform greatly varied work within the petroleum and petrochemical industries. Some perform construction and turnaround activities or drilling and well servicing; specialty contractors provide skills and services that are not typically found within an owner's work force. Contractors may even provide services that augment the peak loads and skills of owners' work forces, such as in the maintenance and operation of facilities. Since owner sites and contracted work are diverse, this standard may not be applicable to all operations at each company or to all contract work performed in those operations. As such, this publication may not apply to incidental contractors that generally do not affect facility safety, such as those that provide janitorial, laundry, and delivery services.

This document addresses "conventional" safety and health. It does not address safety concerns associated with security or terrorism issues. Pages: 26

3rd Edition | October 2011 | Product Number: K222003 | Price: \$91.00

## Std 2220 \*

### Contractor Safety Performance Process—Chinese

Chinese translation of Std 2220.

3rd Edition | October 2011 | Product Number: K222003C | Price: \$64.00

## RP 2221

### Contractor and Owner Safety Program Implementation

Many facilities in the refining and petrochemical processing industries employ contractor personnel for a wide range of activities, from administrative support to equipment repair, maintenance, and construction. Contractor activities that involve work in or around process equipment can have an increased potential to place both contractor personnel and owner personnel at risk.

This guide is intended to assist refining and petrochemical industry facility owners and contractors to implement (or improve) an effective contractor health and safety program. In the petroleum segment, RP 2221 applies to downstream activities only. This includes refineries, pipelines, and marketing and distribution terminals, but not exploration and production or marine. This document provides guidance for applying the principles outlined in RP 2220. Security issues maintain a high profile in all aspects of industry, including the contractor screening and selection process; however, security is outside the scope of this standard and is mentioned as a reminder of the need for many facilities to include security in their contractor processes. This publication intends to preserve the independent contractor relationship while helping both owners and contractors improve contractor safety performance. It is based on experience in the petroleum and petrochemical industries and experience of firms that perform contract work for these industries. Since owner facilities, equipment, sites, and contracted work are diverse, this publication may not be applicable to operations at all facilities or to all contract work performed in these operations. This publication may not apply

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to contractors working in low risk environments that generally do not affect facility safety, such as those that provide incidental or supplementary services such as janitorial, beverage, or laundry.

The purpose of this publication is to assist owners and contractors to improve their safety programs. Joint commitment and support of safety program initiatives are essential in minimizing incidents and preventing injuries and illnesses. The nature of the work performed by contractors within the petroleum and chemical industries varies greatly. Some contractors perform construction and turnaround activities; other specialty contractors provide skills and services that are not typically found within an owner's work force. Other contractors may provide services to augment the peak loads and skills of owners' work forces, such as in maintenance and operation of facilities. These diverse functions and uses of contractors share a common need for effective safety programs to protect owner and contractor personnel from workplace injuries, illnesses, and losses associated with incidents arising out of contractor work. Pages: 87

3rd Edition | August 2011 | Product Number: K222103 | Price: \$167.00

## Publ 2375

**1996 Summary of U.S. Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry**

This annual summary reports on cases recordable in 1996 under the U.S. Bureau of Labor Statistics' recordkeeping guidelines. The survey is based on data submitted to the American Petroleum Institute by 176 oil and gas companies, employing 285,885 persons. The report includes information regarding injuries, illnesses, fatalities, lost workday cases, and incidence rates by function.

June 1997 | Product Number: K23751 | Price: \$96.00

## Publ 2376

**1997 Summary of U.S. Occupational Injuries, Illness, and Fatalities in the Petroleum Industry**

June 1998 | Product Number: K23761 | Price: \$96.00

## Publ 2377

**1998 Summary of U.S. Occupational Injuries, Illness, and Fatalities in the Petroleum Industry**

March 1999 | Product Number: K23771 | Price: \$103.00

## Publ 2378

**1999 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only**

June 2000 | Product Number: K23781 | Price: \$103.00

## Publ 2379

**2000 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only**

March 2001 | Product Number: K23790 | Price: \$103.00

## Publ 2380

**2001 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only**

March 2002 | Product Number: K23801 | Price: \$103.00

## Publ 2381

**2002 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only**

June 2003 | Product Number: K23811 | Price: \$103.00

## Publ 2382

**2003 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only**

May 2004 | Product Number: K23821 | Price: \$103.00

## Publ 2383

**2004 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only**

March 2005 | Product Number: K23831 | Price: \$103.00

## Publ 2384

**2005 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only**

This annual summary reports on cases recordable in 2005 under the US Bureau of Labor Statistics' record keeping guidelines. The survey is based on data submitted to the American Petroleum Institute by oil and gas companies. The report includes information regarding injuries, illness, and fatalities, lost workday cases, and incidence rates by function.

May 2006 | Product Number: K23841 | Price: \$103.00

## Publ 2385

**2006 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only**

June 2007 | Product Number: K23851 | Price: \$103.00

## Publ 2386

**2007 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only**

May 2008 | Product Number: K23861 | Price: \$103.00

## Publ 2387

**2008 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only**

March 2009 | Product Number: K23871 | Price: \$103.00

## Publ 2388

**2009 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only**

Reports on cases recordable in 2009 under the U.S. Bureau of Labor Statistics' recordkeeping guidelines. The survey is based on data submitted to API by oil and gas companies. The report includes information regarding injuries, illness, and fatalities, lost workday cases, and incidence rates by function.

April 2010 | Product Number: K23881 | Price: \$103.00

**1989 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry**

January 1989 | Product Number: K19996 | Price: \$59.00

**1990 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry**

July 1991 | Product Number: K19988 | Price: \$83.00

**1991 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry**

September 1992 | Product Number: K19987 | Price: \$83.00

**1992 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry**

August 1993 | Product Number: K19986 | Price: \$83.00

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## 1993 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

June 1994 | Product Number: K19985 | Price: \$96.00

## 1994 Summary of U.S. Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

June 1995 | Product Number: K19984 | Price: \$96.00

## 1995 Summary of U.S. Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

May 1996 | Product Number: K19983 | Price: \$96.00

### Publ 2510A

#### Fire Protection Considerations for the Design and Operation of Liquefied Petroleum Gas (LPG) Storage Facilities

Supplements Std 2510 and addresses the design, operation, and maintenance of liquefied petroleum gas (LPG) storage facilities from the standpoint of prevention and control of releases, fire protection design, and fire control measures. The history of LPG storage facility safety experience, facility design philosophy, operating and maintenance procedures, and various fire protection and fire-fighting approaches are presented. The storage facilities covered are LPG installations (storage vessels and associated loading/unloading/transfer systems) at marine and pipeline terminals, natural gas processing plants, refineries, petrochemical plants, and tank farms. Pages: 45

2nd Edition | December 1996 | Reaffirmed: December 2015

Product Number: K2510A | Price: \$101.00

## STORAGE TANK SAFETY STANDARDS

### Std 2015 ♦

#### Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks

Applies to stationary atmospheric and low-pressure (up to and including 15 psig) aboveground petroleum storage tanks used in all sectors of the petroleum and petrochemical industry, including:

- crude oil and gas production,
- refining; petrochemicals,
- pipelines and terminals,
- bulk storage, and
- ethanol facilities.

This standard provides requirements for safely planning, coordinating, and conducting tank entry and cleaning operations, from removal from service through return to service. This standard does not and cannot cover every possible unique hazard or situation that may arise during tank cleaning operations. Site, product and tank-specific hazards and situations must be addressed by employers using the appropriate principles and considerations provided for by this standard. Pages: 60

7th Edition | May 2014 | Product Number: K20157 | Price: \$150.00

### RP 2016 ♦

#### Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks (ANSI/API RP 2016)

Supplements the requirements of Std 2015, Seventh Edition. This recommended practice (RP) provides guidance and information on the specific aspects of tank cleaning in order to assist employers (owners/operators and contractors) to conduct safe tank cleaning operations in accordance with the requirements of Std 2015. Pages: 98

1st Edition | August 2001 | Reaffirmed: May 2006

Product Number: K20161 | Price: \$192.00

### RP 2021

#### Management of Atmospheric Storage Tank Fires

Provides experience-based information to enhance the understanding of fires in atmospheric storage tanks containing flammable and combustible materials. It presents a systematic management approach that can assist tank fire prevention. If fires do occur, this information can help responders optimize fire suppression techniques to reduce the severity of an incident and reduce the potential for escalation. Pages: 83

4th Edition | May 2001 | Reaffirmed: June 2006

Product Number: K20214 | Price: \$134.00

### RP 2023

#### Guide for Safe Storage and Handling of Heated Petroleum Derived Asphalt Products and Crude Oil Residua

Describes phenomena that can occur and precautions to be taken in the storage and handling of asphalt products and residua derived from crude petroleum. It applies when these materials are stored in heated tanks at refineries and bulk storage facilities and transported in tank vehicles. Pages: 44

3rd Edition | August 2001 | Reaffirmed: June 2006

Product Number: K20233 | Price: \$110.00

### Publ 2026 ♦

#### Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service

Provides safety information for individuals responsible for performing maintenance or repairs that involve descent onto the floating roofs of petroleum storage tanks. Pages: 15

2nd Edition | April 1998 | Reaffirmed: June 2006

Product Number: K20262 | Price: \$62.00

### RP 2207 ♦

#### Preparing Tank Bottoms for Hot Work

Addresses only the safety aspects of hot work on petroleum storage tank bottoms. It discusses safety precautions for preventing fires, explosions, and associated injuries. The term "hot work," as used in this publication, is defined as an operation that can produce a spark or flame hot enough to ignite flammable vapors. Pages: 32

6th Edition | December 2007 | Reaffirmed: March 2012

Product Number: K22076 | Price: \$86.00

### Std 2350

#### Overfill Protection for Storage Tanks in Petroleum Facilities (ANSI/API Std 2350)

Applies to storage tanks associated with marketing, refining, pipeline, and terminals operations and with tanks containing Class I or Class II petroleum liquids and use is recommended for Class III petroleum liquids. This standard addresses overfill protection for petroleum storage tanks. It recognizes that prevention provides the most basic level of protection, thus while using both terms "protection" and "prevention," the document emphasizes prevention. The standard's scope covers overfill (and damage) prevention practices for aboveground storage tanks in petroleum facilities, including refineries, marketing terminals, bulk plants, and pipeline terminals that receive flammable and combustible liquids. The fourth edition continues to build on experience and new technology through the use of management systems. Since operations are the primary overfill prevention safeguard, new definitions and requirements are established for alarms. Risk reduction is also addressed by current and generally accepted industry practices.

The essential elements of this document are based on current industry safe operating practices and existing consensus standards. Federal, state, and local regulations or laws may contain additional requirements for tank overfill protection programs. For existing facilities, the results of a risk-based analysis of aboveground atmospheric petroleum storage tanks may indicate the need for more protection against overfilling. In such cases, some provisions from this standard may be suitable.



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The purpose of this standard is to assist owner/operators and operating personnel in the prevention of tank overfills by implementation of a comprehensive overfill prevention process (OPP). The goal is to receive product into the intended storage tank without overfill or loss of containment.

This standard does not apply to: underground storage tanks; aboveground tanks of 1320 U.S. gallons (5000 liters) or less; aboveground tanks that comply with PEI 600; pressure vessels; tanks containing non-petroleum liquids; tanks storing LPG and LNG; tanks at service stations; tanks filled exclusively from wheeled vehicles (i.e. tank trucks or railroad tank cars); and tanks covered by OSHA 29 *CFR* 1910.119 and EPA 40 *CFR* 68, or similar regulations. Pages: 47

**4th Edition | May 2012 | Product Number: K235004 | Price: \$114.00**