

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

API RECOMMENDED PRACTICE 74
FIRST EDITION, OCTOBER 2001

REAFFIRMED, JANUARY 2013



AMERICAN PETROLEUM INSTITUTE

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

Upstream Segment

API RECOMMENDED PRACTICE 74
FIRST EDITION, OCTOBER 2001

REAFFIRMED, JANUARY 2013



AMERICAN PETROLEUM INSTITUTE

SPECIAL NOTES

API publications necessarily address problems of a general nature. With respect to particular circumstances, local, state, and federal laws and regulations should be reviewed.

API is not undertaking to meet the duties of employers, manufacturers, or suppliers to warn and properly train and equip their employees, and others exposed, concerning health and safety risks and precautions, nor undertaking their obligations under local, state, or federal laws.

Information concerning safety and health risks and proper precautions with respect to particular materials and conditions should be obtained from the employer, the manufacturer or supplier of that material, or the material safety data sheet.

Nothing contained in any API publication is to be construed as granting any right, by implication or otherwise, for the manufacture, sale, or use of any method, apparatus, or product covered by letters patent. Neither should anything contained in the publication be construed as insuring anyone against liability for infringement of letters patent.

Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. Sometimes a one-time extension of up to two years will be added to this review cycle. This publication will no longer be in effect five years after its publication date as an operative API standard or, where an extension has been granted, upon republication. Status of the publication can be ascertained from the API Upstream Segment [telephone (202) 682-8000]. A catalog of API publications and materials is published annually and updated quarterly by API, 1220 L Street, N.W., Washington, D.C. 20005.

This document was produced under API standardization procedures that ensure appropriate notification and participation in the developmental process and is designated as an API standard. Questions concerning the interpretation of the content of this standard or comments and questions concerning the procedures under which this standard was developed should be directed in writing to the general manager of the Upstream Segment, American Petroleum Institute, 1220 L Street, N.W., Washington, D.C. 20005. Requests for permission to reproduce or translate all or any part of the material published herein should also be addressed to the general manager.

API standards are published to facilitate the broad availability of proven, sound engineering and operating practices. These standards are not intended to obviate the need for applying sound engineering judgment regarding when and where these standards should be utilized. The formulation and publication of API standards is not intended in any way to inhibit anyone from using any other practices.

Any manufacturer marking equipment or materials in conformance with the marking requirements of an API standard is solely responsible for complying with all the applicable requirements of that standard. API does not represent, warrant, or guarantee that such products do in fact conform to the applicable API standard.

All rights reserved. No part of this work may be reproduced, stored in a retrieval system, or transmitted by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission from the publisher. Contact the Publisher, API Publishing Services, 1220 L Street, N.W., Washington, D.C. 20005.

Copyright © 2001 American Petroleum Institute

FOREWORD

This recommended practice was prepared by the API Production Safety Subcommittee. This publication is under the jurisdiction of the American Petroleum Institute Upstream Department's Executive Committee on Drilling and Production Operations. The goal of this recommended practice is to assist the oil and gas industry in promoting personnel and public safety. This publication has intentionally stressed recommended safe operating practices concentrating on personnel and public safety. THE PUBLICATION DOES NOT, HOWEVER, PURPORT TO BE SO COMPREHENSIVE AS TO PRESENT ALL OF THE RECOMMENDED SAFE OPERATING PRACTICES THAT CAN AFFECT SAFETY IN ONSHORE OIL AND GAS PRODUCTION OPERATIONS. It is intended that this voluntary recommended practice will promote and maintain safe working conditions for personnel engaged in onshore production operations. Every effort has been made by API to assure the accuracy and reliability of data contained in this document. However, the Institute makes no representation, warranty, or guarantee in connection with the publication of this recommended practice and hereby expressly disclaims any liability or responsibility for loss or application hereunder or for any violation of local, state, or federal laws with which the contents may conflict. INFORMATION CONCERNING SAFETY AND HEALTH RISKS AND PROPER PRECAUTIONS WITH RESPECT TO PARTICULAR MATERIALS AND CONDITIONS SHOULD BE OBTAINED FROM THE EMPLOYER, THE MANUFACTURER OR SUPPLIER OF THAT MATERIAL, OR THE MATERIAL SAFETY DATA SHEET (MSDS). Users of this publication are reminded that constantly developing technology and specialized or limited operations do not permit complete coverage of all operations or alternatives. Recommendations presented herein are not intended to inhibit developing technology and equipment improvements or improved operational procedures. This document is not a substitute for qualified engineering analysis and judgment to fit the specific operations situation. The publication is available for review by federal and state agencies or authorities and possible use as a model safe practice to assist in preparation or revision of occupational safety codes or regulations. Recommendations set forth in this publication are viewed as one satisfactory method for accomplishing a desired result. They should not be considered as the only method for achieving the desired results. This publication includes usage of the verbs "shall" and "should," whichever is deemed most applicable for the specific situation. For the purposes of this publication, the following definitions are applicable:

Shall: Denotes that the recommended practice has universal application to that specific activity.

Should: Denotes a recommended practice: (1) where a safe comparable alternative practice is available; (2) that may be impractical under certain circumstances; or (3) that may be unnecessary for personnel safety under certain circumstances. Proposed changes in these interpretations and usages should be brought to the attention of the responsible authorizing committee to determine that the intent of the publication will be sustained.

API publications may be used by anyone desiring to do so. Every effort has been made by the Institute to assure the accuracy and reliability of the data contained in them; however, the Institute makes no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaims any liability or responsibility for loss or damage resulting from its use or for the violation of any federal, state, or municipal regulation with which this publication may conflict.

Suggested revisions are invited and should be submitted to the general manager of the Upstream Segment, American Petroleum Institute, 1220 L Street, N.W., Washington, D.C. 20005.

CONTENTS

	Page
1 GENERAL.....	1
1.1 Purpose	1
1.2 Scope.....	1
1.3 Responsibility	1
2 REFERENCES	1
2.1 References—Industry Codes, Practices, and Standards	1
3 DEFINITIONS AND ACRONYMS	2
4 SAFETY.....	4
4.1 Safety Practices	4
4.2 Hazard Communication	4
4.3 Personal Protective Equipment (PPE)	5
4.4 Fall Protection.....	6
4.5 Housekeeping	6
4.6 Machinery and Tools	6
4.7 Welding and Cutting Equipment	7
5 CONTRACTOR SAFETY AND TRAINING.....	7
6 SAFE WORK PRACTICES	8
6.1 Load Lifting	8
6.2 Confined Space, Excavations, and Hazardous Environments	8
6.3 Lockout/Tagout.....	8
6.4 Hotwork, Welding, and Flame Cutting Operations	9
6.5 Work in Proximity to Exposed Energized Power Sources	10
7 DESIGN.....	11
7.1 Emergency Eye or Body Wash Stations.....	11
7.2 Critical Equipment	11
7.3 Changes to Critical Equipment	11
7.4 Fire Prevention	11
7.5 Fire Protection.....	11
7.6 Grounding and Bonding	12
7.7 Flammable Liquids.....	12
7.8 Equipment.....	13
8 TRAINING	14
8.1 General	14
9 PROCEDURES	14
9.1 Well Startup	14
10 MAINTENANCE	15
10.1 General	15
10.2 Tank Cleaning	15
10.3 Drilling and Well Servicing	15

	Page
11 INCIDENT INVESTIGATION	15
12 EMERGENCY RESPONSE.....	15
12.1 General	15
12.2 Medical Services.....	15
12.3 First Aid	15
13 SPECIAL OPERATIONS.....	15
13.1 Well Testing	15
13.2 Pumping and Hot Oil Operations (Flowlines).....	15
13.3 Pigging Operations	16
13.4 Hot Tapping on Equipment in Service.....	16
APPENDIX A EXAMPLE LEASE PRODUCTION SAFETY CHECKLIST	17
APPENDIX B EXAMPLE COMPRESSOR/BOOSTER STATIONS SAFETY CHECKLIST	21
Tables	
1 Maximum Permissible Noise Exposures	5
2 Recommended Minimum Clearances Between Power Lines and Derricks, Masts, or Guylines	10

Recommended Practice for Occupational Safety for Onshore Oil and Gas Production Operations

1 General

1.1 PURPOSE

The purpose of this document is to recommend practices and procedures for promotion and maintenance of safe working conditions for personnel engaged in onshore oil and gas production, including special services.

1.2 SCOPE

These recommendations apply to production operations as defined herein. For information on drilling, well servicing and workover operations, see API RP 54.

1.3 RESPONSIBILITY

These recommendations are made recognizing that owners, operators, contractors, and their personnel have separate responsibilities that may be contractual in nature. To ensure the safe performance of work covered by these recommendations, each employer should provide training and instruction for its personnel. It is not the intent of these recommendations to alter the contractual relationship(s) between the parties. The well owner or operator should provide and the contractor should seek pertinent information that is known or assumed and that the contractor may need to assure a safe operation. At all times, the specific work activity being performed should be under the immediate supervision of an authorized person who has the authority to commence, modify, or cease the work methods or operations, as necessary, to ensure the safety of affected personnel and the general public. The authorized person should observe changing conditions and improve, whenever required, the work methods to promote increased protection for the personnel.

2 References

2.1 REFERENCES—INDUSTRY CODES, PRACTICES, AND STANDARDS

The following publications are either referenced in this recommended practice or would be useful in its implementation:

American Petroleum Institute

Spec 6A	<i>Wellhead and Christmas Tree Equipment</i>
Spec 11E	<i>Pumping Units</i>
RP 11ER	<i>Guarding of Pumping Units (ANSI)</i>
Spec 12J	<i>Oil and Gas Separators</i>
Spec 12K	<i>Indirect-Type Oil Field Heaters</i>
Spec 12L	<i>Vertical and Horizontal Emulsion Heaters</i>

RP12N	<i>Operations, Maintenance and Testing of Firebox Flame Arrestors</i>
RP 12R1	<i>Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service</i>
RP49	<i>Drilling and Well Servicing Operations Involving Hydrogen Sulfide</i>
RP 54	<i>Occupational Safety for Oil and Gas Well Drilling and Servicing Operations</i>
RP 55	<i>Oil and Gas Production and Gas Processing Plant Operations Involving Hydrogen Sulfide</i>
RP 75	<i>Recommended Practice for Development of a Safety and Environmental Management Program for Outer Continental Shelf (OCS) Operations and Facilities</i>
RP 500	<i>Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2</i>
RP505	<i>Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1 and Zone 2</i>
Publ 510	<i>Pressure Vessel Inspection Code: Maintenance Inspection, Rating, Repair, and Alteration</i>
Publ 520	<i>Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries</i>
Publ 521	<i>Guide for Pressure-Relieving and Depressuring Systems</i>
RP 750	<i>Management of Process Hazards</i>
RP 752	<i>Management of Hazards Associated with Location of Process Plant Buildings, CMA Managers Guide</i>
Publ 761	<i>Model Risk Management Program Guidance for E&P Facilities—Guidance for Complying with EPA's Rule (40 CFR 68)</i>
Std 1104	<i>Welding of Pipelines and Related Facilities</i>
RP 1107	<i>Pipeline Maintenance Welding Practices</i>
RP 2003	<i>Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents</i>
Publ 2009	<i>Safe Welding and Cutting Practices in Refineries, Gasoline Plants, and Petrochemical Plants</i>
Std 2015	<i>Safe Entry and Cleaning Petroleum Storage Tanks</i>
Publ 2201	<i>Procedures for Welding or Hot Tapping on Equipment in Service</i>
Publ 2207	<i>Preparing Tank Bottoms for Hot Work</i>
Publ 2217A	<i>Guidelines for Work in Inert Confined Spaces in the Petroleum Industry</i>

RP 2220	<i>Improving Owner and Contractor Safety Performance</i>	ASME ⁴	<i>ASME Boiler and Pressure Vessel Code, Sections VIII and IX</i>
RP 2221	<i>Managers Guide to Implementing a Contractor Safety Program</i>		
Publ 2510	<i>Design and Construction of Liquefied Petroleum Gas (LPG) Installations</i>	ASNT ⁵	<i>Recommended Practice No. ASNT-TC-1A</i>
Publ 2510A	<i>Fire-Protection Considerations for the Design and Operation of Liquefied Petroleum Gas (LPG) Storage Facilities</i>	NACE ⁶	
Publ 9100	<i>Model Environmental Health and Safety Management System and Guidance Document</i>	Std MR0175	<i>Requirements for Sulfide Stress Cracking Resistant Metallic Material for Oil Field Equipment</i>
ACGIH ¹	<i>Threshold Limit Values and Biological Indices</i> <i>Industrial Ventilation, A Manual of Recommended Practice, 22nd Edition</i>	NFPA ⁷	
ANSI ²		NFPA 10	<i>Standard for Portable Fire Extinguishers</i>
B15.1	<i>Safety Standard for Mechanical Power Transmission Apparatus</i>	NFPA 30	<i>Flammable and Combustible Liquids Code</i>
S1.13-1995	<i>Measurement of Sound Pressure Levels in Air</i>	NFPA 51B	<i>Standard for Fire Prevention in Use of Cutting and Welding Processes</i>
S12.6-1997	<i>Methods for Measuring the Real-Ear Attenuation of Hearing Protectors</i>	NFPA 58	<i>Standard for the Storage and Handling of Liquefied Petroleum Gases</i>
S12.19-1996	<i>Measurement of Occupational Noise Exposure</i>	NFPA 70	<i>National Electrical Code</i>
S12.36	<i>Survey Methods for the Determination of Sound Power Levels of Noise Sources</i>	NFPA 77	<i>Recommended Practice on Static Electricity</i>
Z41.1-1979	<i>Men's Safety-Toe Footwear</i>	OSHA ⁸	
Z87.1	<i>Standard Practice for Occupational and Educational Eye and Face Protection</i>		29 CFR 1910
Z87.2	<i>Safety Requirements for Industrial Protective Helmets for Electrical Workers, Class B</i>		29 CFR 1926
Z88.2-1992	<i>Respiratory Protection</i>		
Z89.1	<i>Safety Requirements for Industrial Head Protection</i>		
Z117.1-1995	<i>Safety Requirements for Confined Space</i>		
Z358.1	<i>Emergency Eyewash and Shower Equipment</i>		
Z359.1	<i>Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components</i>		
2117.1	<i>Confined Space</i>		
ANSI/IES ³			
RP7-1988	<i>Industrial Lighting</i>		

¹American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadow Drive, Suite 600, Cincinnati, Ohio 45240-1634.

²American National Standards Institute, 11 West 42nd Street, New York, New York 10036.

³Illuminating Engineering Society of North America, 120 Wall Street, New York, New York 10005-4001.

⁴ASME International, 3 Park Avenue, New York, New York 10016-5990.

⁵American Society of Nondestructive Testing, 1711 Arlington Lane, Columbus, Ohio 43228.

⁶NACE International, 1440 South Creek Drive, P.O. Box 218340, Houston, Texas 77218-8340.

⁷National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts 02269-9101.

⁸Occupational Safety and Health Administration, U.S. Department of Labor, Washington, D.C. 20402.

3 Definitions and Acronyms

The following definitions and abbreviations are provided to help clarify and explain use of certain terms in this publication. Users should recognize that some of these terms could be used in other instances where the application or meaning may vary from the specific information provided herein.

3.1 adequate ventilation: Adequate ventilation is for the prevention of fire and explosions. Adequate ventilation is ventilation (natural or artificial) that is sufficient to prevent the accumulation of significant quantities of vapor-air mixtures in concentrations above 10% of their lower explosive limit (LEL).

3.2 ANSI: American National Standards Institute.

3.3 API: American Petroleum Institute.

3.4 approved: Sanctioned, endorsed, accredited, certified, or accepted by a duly constituted and recognized authority or agency.



3.5 ASTM: American Society for Testing and Materials.

3.6 authorized person: A qualified person assigned by an employer to perform or supervise the performance of a specific type of duty or duties at the work site.

3.7 cellar: Excavation around the wellhead to provide space for items of equipment at the top of the wellbore.

3.8 Christmas tree: The valves and fittings assembled at the top of a completed well to control the flow of hydrocarbons and other fluids. See API Spec 6A.

3.9 combustible liquid: Any liquid having a flash-point at or above 100°F.

3.10 contractor: Any person or company that contracts or subcontracts to perform all or any part of oil and gas well production operations.

3.11 critical equipment: Equipment and other systems determined to be essential in preventing the occurrence of, or mitigating the consequences of an uncontrolled event.

3.12 electrical classification of areas: Locations are classified according to API RP 500 or API RP 505.

3.13 flammable liquid: Any liquid having a flashpoint below 100°F.

3.14 full body harness: Straps which may be secured about a person in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders, with means for attaching it to other components of a personal fall arrest system.

3.15 guarded: Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers or casings, barrier rails, or screens to eliminate the possibility of accidental contact with or dangerous approach by persons, animals, or objects.

3.16 hazardous substance: Any substance that, by reason of being explosive, flammable, toxic, corrosive, oxidizing, irritating, or otherwise harmful, has the potential to cause injury, illness, or death.

3.17 hot oil treatment: The process of heating oil and pumping it into piping, tubing, casing, or a formation to remove paraffin.

3.18 hot tapping (pipe tapping): The process of drilling a hole through the wall of pipe that is under pressure. A special saddle is used to attach a valve and lubricator to the pipe.

3.19 hot work: Work involving electric or gas welding, cutting, brazing, grinding or similar flame or spark producing operations.

3.20 lanyard: A flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline or anchorage.

3.21 lockout/tagout: A procedure to control hazardous energy.

3.22 NFPA: National Fire Protection Association.

3.23 operator: Lease owner or his designated agent who is responsible for the overall operation of the lease.

3.24 personal fall arrest system (PFAS): A system designed to provide protection to a person from falls. The PFAS should consist of an anchorage, connector and a synthetic webbing full body harness which may include a lanyard and a deceleration device.

3.25 PPE: Personal Protective Equipment.

3.26 pumping unit: Surface equipment used for the purpose of mechanically lifting fluids from a well. See API Spec 11E and API/ANSI 11ER.

3.27 qualified person: A person who, by possession of a recognized degree, certificate, or professional standing, or who by knowledge, training, or experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter or the work.

3.28 rated working pressure: The maximum internal pressure that equipment is designed to contain and/or control. Working pressure is not to be confused with test pressure.

3.29 shall: For the purpose of this document, shall indicates that the recommended practice(s) has universal application to that specific activity.

3.30 should: For the purpose of this document, should denotes a recommended practice(s) (a) where a safe comparable alternative practice(s) is available; (b) that may be impractical under certain circumstances; or (c) that may be unnecessary for personnel safety under certain circumstances.

3.31 simultaneous operations: Two or more of the following activities being performed in close proximity: production, drilling, completion, workover, wireline (except routine operations), major construction operations, well testing and maintenance.

3.32 supervisor: Person who has been given the control, direction, or supervision of work performed by one or more personnel.

3.33 well servicing: Well work involving pulling or running tubulars or sucker rods, to include but not limited to redrilling, completing, recompleting, workover, and abandonment operations.