

INTERNATIONAL
STANDARD

ISO
10418

First edition
1993-12-15

**Petroleum and natural gas industries —
Offshore production platforms — Analysis,
design, installation and testing of basic
surface safety systems**

*Industries du pétrole et du gaz naturel — Plates-formes de production en
mer — Analyse, conception, installation et essais des systèmes
essentiels de sécurité de surface*



Reference number
ISO 10418:1993(E)

Foreword

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International Standard ISO 10418 was prepared by the American Petroleum Institute (API) (as RP 14C, 4th edition) and was adopted, under a special "fast-track procedure", by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum and natural gas industries*, in parallel with its approval by the ISO member bodies.

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Introduction

International Standard ISO 10418:1993 reproduces the content of API RP 14C, 4th edition, 1986. ISO, in endorsing this API document, recognizes that in certain respects the latter does not comply with all current ISO rules on the presentation and content of an International Standard. Therefore, the relevant technical body, within ISO/TC 67, will review ISO 10418:1993 and reissue it, when practicable, in a form complying with these rules.

This standard is not intended to obviate the need for sound engineering judgement as to when and where this standard should be utilized and users of this standard should be aware that additional or differing requirements may be needed to meet the needs for the particular service intended.

Standards referenced herein may be replaced by other international or national standards that can be shown to meet or exceed the requirements of the referenced standards.

Appendix E to this document is included only as guidelines.

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Petroleum and natural gas industries — Offshore production platforms — Analysis, design, installation and testing of basic surface safety systems

1 Scope

This International Standard lays down the recommended practice for analysis, design, installation and testing of basic surface safety systems for offshore production platforms.

2 Requirements

Requirements are specified in:

“API Recommended Practice 14C (RP 14C), Fourth Edition, September 1, 1986 — *Recommended Practice for Analysis, Design, Installation and Testing of Basic Surface Safety Systems for Offshore Production Platforms*”,

which is adopted as ISO 10418.

For the purposes of international standardization, however, modifications shall apply to specific clauses and paragraphs of publication API RP 14C. These modifications are outlined below.

The conversion of English units shall be made in accordance with ISO 31.

page 90, Table C.1

LENGTH	1 inch (in)	= 25,4 mm (exactly)
	1 foot (ft) = 12 in	= 304,8 mm or 0,3048 m (exactly)

page 93, Section D3

pages 94 and 95, Table D2

PRESSURE	1 pound-force per square inch (lbf/in ²)	= 6 894,757 Pa
FLOW RATE	1 cubic foot per minute (ft ³ /min)	= 0,028 316 85 m ³ /min or 28,316 85 l/min

For cc/min please read cm³/min or 10⁻³ dm³/min = 10⁻³ l/min.

Page 12

Subclause 1.4

Information given in the POLICY is relevant to the API publication only.

Subclause 1.5

Requirements in this subclause, covering the design, installation and operation of facilities on offshore production platforms, do not apply when sites are located outside the US jurisdiction.

Page 13

Subclause 1.6, item b.

The referenced standards listed hereafter are available under the following ISO references:

- (2) API RP 14B as ISO 10417
- (3) API RP 14E as ISO 13703 (at present under study)
- (5) API RP 14G as ISO 13702 (at present under study)
- (6) API RP 14H as ISO 10419
- (12) API Spec 6A as ISO 10423
- (15) API Spec 14A as ISO 10432
- (16) API Spec 14D as ISO 10433

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

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API RECOMMENDED PRACTICE 14C (RP 14C)
FOURTH EDITION, SEPTEMBER 1, 1986

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ERRATA

November 1, 1986

to

Fourth Edition of
API RP 14C
RECOMMENDED PRACTICE
for

ANALYSIS, DESIGN, INSTALLATION AND TESTING OF BASIC SURFACE SAFETY SYSTEMS FOR OFFSHORE PRODUCTION PLATFORMS

Page 10, Table 2.1; Replace the table "Sensing and Self-Acting Devices" with the following:

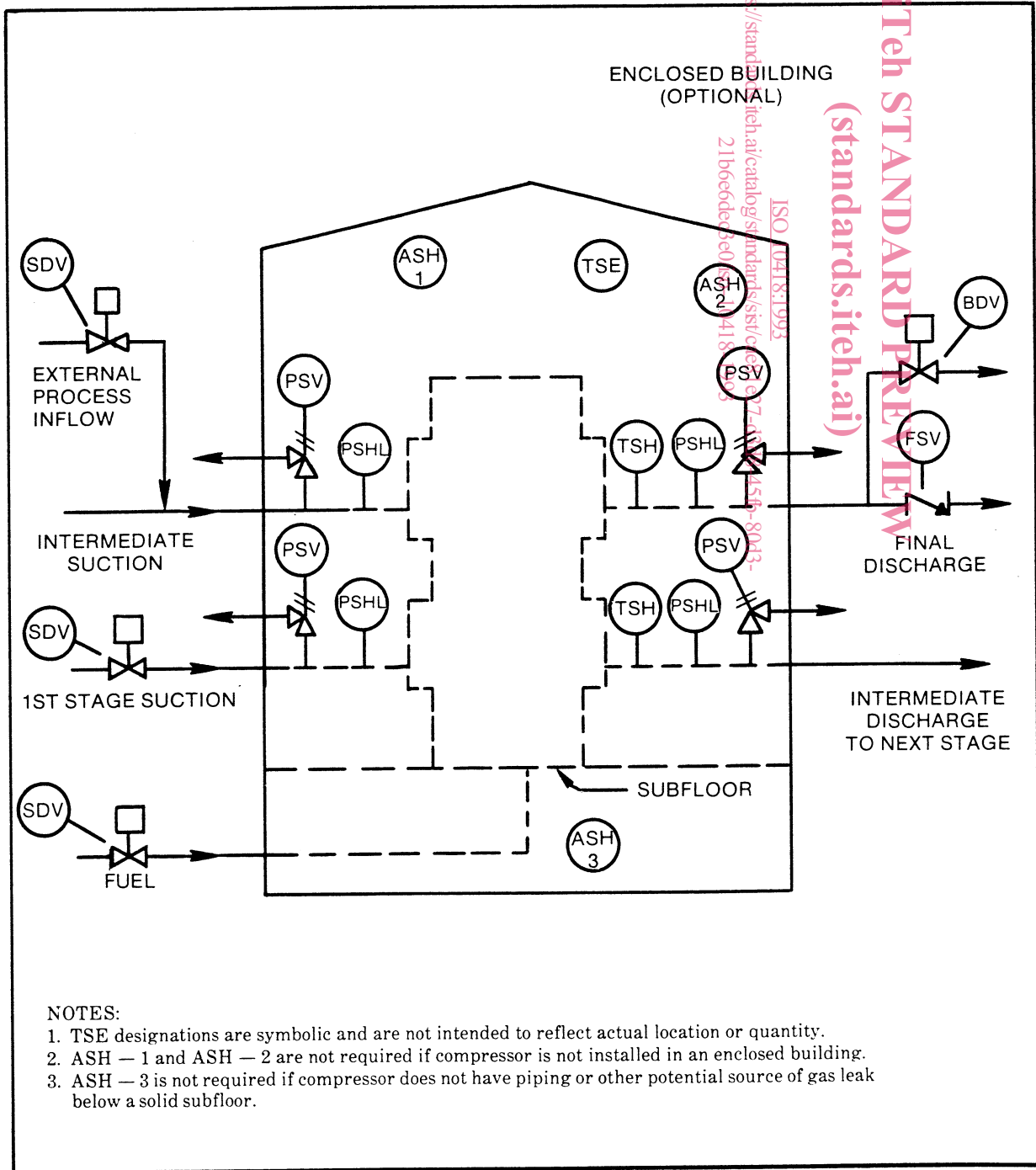
TABLE 2.1
SAFETY DEVICE SYMBOLS
(Continued)

SENSING AND SELF-ACTING DEVICES				
VARIABLE	SAFETY DEVICE DESIGNATION		SYMBOL	
	C O M M O N	INSTRUMENT SOCIETY OF AMERICA (I.S.A.)	SINGLE DEVICE	COMBINATION DEVICE
FIRE	Flame Detector (Ultraviolet/ Infrared)		⊙ USH	
	Heat Detector (Thermal)	Temperature Safety High	⊙ TSH	
	Smoke Detector (Ionization)		⊙ YSH	
	Fusible Material	Temperature Safety Element	⊙ TSE	
Combustible Gas Concentration	Combustible Gas Detector	Analyzer Safety High	⊙ ASH	

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Page 61, Figure A8; Replace with the following:

FIGURE A8
RECOMMENDED SAFETY DEVICES
COMPRESSOR UNIT



NOTES:

1. TSE designations are symbolic and are not intended to reflect actual location or quantity.
2. ASH — 1 and ASH — 2 are not required if compressor is not installed in an enclosed building.
3. ASH — 3 is not required if compressor does not have piping or other potential source of gas leak below a solid subfloor.

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OFFICIAL PUBLICATION



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**API RECOMMENDED PRACTICE FOR ANALYSIS, DESIGN,
INSTALLATION AND TESTING OF BASIC SURFACE SAFETY
SYSTEMS FOR OFFSHORE PRODUCTION PLATFORMS**

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NOTE: Each appendix is preceded with an individual table of contents.

FOREWORD

a. This Recommended Practice (RP) is under the jurisdiction of the American Petroleum Institute (API) Committee on Standardization of Offshore Safety and Anti-Pollution Equipment (OSAPE). It has been prepared with guidance from the API, Offshore Operators Committee (OOC), and the Western Oil and GAS Association (WOGA).

b. This RP presents a standardized method to design, install and test surface safety systems on offshore production platforms and is intended for use by design engineers and operating personnel. Recognized system analysis methods are used to develop requirements for a safety system and procedures are included to document the safety system and verify conformance with the RP.

NOTE: This is the Fourth Edition of this publication. It includes changes made through OSAPE Meeting No. 42, June, 1985, and later ratified by letter ballot.

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DEFINITIONS

ABNORMAL OPERATING CONDITION	—A condition which occurs in a process component when an operating variable ranges outside of its normal operating limits.	FLOWLINE SEGMENT	—Any portion of a flowline that has an operating pressure different from another portion of the same flowline.
ATMOSPHERIC SERVICE	—Refers to operation at gauge pressures between ½ ounce per square inch vacuum and 5 pounds per square inch pressure.	GAS BLOWBY	—The discharge of gas from a process component through a liquid outlet.
AUTOMATICALLY FIRED VESSEL	—A fired vessel with the burner fuel controlled by an automatic temperature or pressure controller.	GAS DETECTION SYSTEM	—A control system which monitors the concentration of combustible gases and initiates alarm and shutdown functions at predetermined concentrations.
BACKFLOW	—Fluid flow in a process component opposite to the normal flow direction.	HIGH LIQUID LEVEL	—Liquid level in a process component above the highest operating level.
BLOWDOWN VALVE	—An automatically operated normally open valve used to vent the pressure from a process station on shutdown.	HIGH PRESSURE	—Pressure in a process component in excess of the maximum operating pressure but less than the maximum allowable working pressure (for pipelines, maximum allowable operating pressure).
CLASSIFIED AREA	—Any area electrically classified Class I, Group D, Division 1 or 2, following guidelines of API RP 500B.	HIGH TEMPERATURE	—Temperature in a process component in excess of the design operating temperature.
CONTAINMENT	—Any method used on an offshore platform to collect and direct escaped liquid hydrocarbons to a safe location.	INDIRECT HEATED COMPONENT	—A vessel or heat exchanger used to increase the temperature of a fluid by the transfer of heat from another fluid, such as steam, hot water, hot oil or other heated medium.
DETECTABLE ABNORMAL CONDITION	—An abnormal operating condition which can be automatically detected.	LEAK	—The accidental escape from a process component of liquid and/or gaseous hydrocarbons to atmosphere.
DIRECT IGNITION SOURCE	—A point of sufficient temperature and heat capacity to ignite a combustible mixture.	LIQUID OVERFLOW	—The discharge of liquids from a process component through a gas (vapor) outlet.
EMERGENCY SHUTDOWN (ESD) SYSTEM	—A system of manual stations which, when activated, initiate platform shutdown.	LOWER EXPLOSIVE LIMIT (L.E.L.)	—The lowest concentration by volume of combustible gases in mixture with air that can be ignited at ambient conditions.
EXCESS TEMPERATURE	—Temperature in a process component in excess of the rated working temperature.	LOW FLOW	—Flow in a process component less than the minimum operating flow rate.
FAILURE	—Improper performance of a device or equipment item that prevents completion of its design function.	LOW LIQUID LEVEL	—Liquid level in a process component below the lowest operating level.
FIRED VESSEL	—A vessel in which the temperature of a fluid is increased by the addition of heat supplied by a flame within the vessel.	LOW PRESSURE	—Pressure in a process component less than the minimum operating pressure.
FIRE LOOP	—A pneumatic control line containing temperature sensing elements (fusible plugs, synthetic tubing, etc.) which, when activated, will initiate platform shutdown.	LOW TEMPERATURE	—Temperature in a process component less than the minimum operating temperature.
FLAME FAILURE	—A flame which is inadequate to instantaneously ignite combustible vapors entering the firing chamber.	MALFUNCTION	—Any condition of a device or an equipment item that causes it to operate improperly, but does not prevent the performance of its design function.
FLOWLINE	—Piping which directs the well stream from the wellhead to the first downstream process component.		

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DEFINITIONS (continued)

MAXIMUM ALLOWABLE OPERATING PRESSURE	—The highest operating pressure allowable at any point in a pipeline system during normal flow or static conditions.	QUALIFIED PERSON	—An individual with characteristics or abilities gained through training or experience or both as measured against established requirements, such as standards or tests that enable the individual to perform a required function.
MAXIMUM ALLOWABLE WORKING PRESSURE	—The highest operating pressure allowable at any point in any component other than a pipeline during normal operation or static conditions.	SAFETY DEVICE	—An instrument or control used within the safety system.
NORMALLY CLOSED VALVE	—A valve which will shift to the closed position upon loss of the power medium.	SENSOR	—A device which detects an abnormal operating condition and transmits a signal to perform a specific shutdown function.
NORMALLY OPEN VALVE	—A valve which will shift to the open position upon loss of the power medium.	SHUTDOWN VALVE (SDV)	—An automatically operated normally closed valve used for isolating a process station.
OVERPRESSURE	—Pressure in a process component in excess of the maximum allowable working pressure (for pipelines, maximum allowable operating pressure).	SUBSURFACE SAFETY VALVE (SSSV)	—A device installed in a well below the wellhead with the design function to prevent uncontrolled well flow when actuated.
PIPELINE	—Piping which directs fluids between platforms or between a platform and a shore facility.	SUBSURFACE CONTROLLED SUBSURFACE SAFETY VALVE (SSCSV)	—A SSSV actuated by the pressure characteristics of the well.
PLATFORM SAFETY SYSTEM	—An arrangement of safety devices and Emergency Support Systems to effect platform shutdown. The system may consist of a number of individual process shutdowns and may be actuated by either manual controls or automatic devices sensing detectable abnormal conditions.	SURFACE CONTROLLED SUBSURFACE SAFETY VALVE (SCSSV)	—A SSSV controlled from the surface by hydraulic, electric, mechanical or other means.
PLATFORM SHUTDOWN	—The shutting in of all process stations of a platform production process and all support equipment for the process.	SURFACE SAFETY VALVE (SSV)	—An automatic wellhead valve assembly which will close upon loss of power supply.
PNEUMATIC POWER SYSTEM	—A system which supplies pressure to operate pneumatic actuators.	UNDERPRESSURE	—Pressure in a process component less than the design collapse pressure.
PROCESS COMPONENT	—A single functional piece of production equipment and associated piping, used in a process station such as a separator, heater, pump or tank.	UNDERWATER SAFETY VALVE (USV)	—An automatic valve assembly (installed at an underwater wellhead location) which will close upon loss of power supply.
PROCESS SHUTDOWN	—The isolation of a given process station from the process by closing appropriate SDVs to shut-in flow to the process station or divert flow to another process station.	UNDESIRABLE EVENT	—An adverse occurrence or situation in a process component or process station which poses a threat to safety such as overpressure, underpressure, liquid overflow, etc.
PROCESS STATION	—One or more process components performing a specific process function, such as separating, heating, pumping, etc.	VACUUM	—Pressure in a process component less than atmospheric pressure.
		VENT	—A pipe or hatch on a vessel that opens to the atmosphere. A vent line might contain a pressure and/or vacuum relief device.

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