

# INDUSTRY STANDARD

## NO. 44

### **Standards & Acceptance Checklist**

### **Well Operations**

**26 April 2016**

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## Notes

*Note 1:*

*All references to ISO & API should be against latest revisions.*

*Note 2:*

*Pressure tests on installed well components are to be carried out to the maximum expected well pressure at the area of interest plus a bullhead margin.*

*Note 3:*

*Wherever possible, pressure tests on components should be carried out in the direction of well flow.*

*Note 4:*

*For selection & acceptance criteria refer to Standard 41 Well Construction Process Checklist.*

## Abbreviations

API	American Petroleum Institute
HSE(Q)	Health, Safety, Environment (Quality)
IADC	International Association of Drilling Contractors
ISO	International Standardization Organization
SodM (SSM)	Staatstoezicht op de Mijnen (State Supervision of Mines)

## Legal requirements

Offshore Safety Directive	EU Directive 2013/30/EU
Mining Decree	Possible date of introduction July 2016
Mining Regulations	Chapter 8

## Nogepa Standards

NOGEPA 1	TRAINING HANDBOOK
NOGEPA 41	WELL CONSTRUCTION CHECKLIST
NOGEPA 42	WELL EXAMINATION
NOGEPA 43	SURFACE BOP
NOGEPA 45	WELL DECOMMISSIONING
NOGEPA 51	BARRIERS FOR WELL INTEGRITY

## 1. Executive Summary

This Standard provides an overview of API and ISO industry standards developed for oil and gas wells. The Standard therefore is an aid for companies to help select the Standards they was to use when:

- designing & drilling wells
- preparing and executing well intervention
- preparing and executing route well operations

It is recommended to always use for the most recent version of a standard.

This standards should aid in:

- Formalizing employee competency and training of personnel
- Reinforcing risk assessment and risk management throughout the standard
- Organizing Contingency planning
- Controlling the supply chain
- Validating the Preventive maintenance system
- Validating of designs
- Formulating the Management of change process

Well components are considered critical when:

- They form a well barrier or can be defined as a well barrier element
- They consist of moving parts that over time are susceptible to failure
- Are exposed to wellbore fluids that may be corrosive and/or erosive
- Are subject to wear and tear due to excessive use/functioning
- They show up as critical in the HAZID/risk assessment performed as part of the well construction process.

Together with the list of critical well components the applicable standards relate largely to the manufacture and supply of these components. Also included with this checklist are the recommended operational acceptance tests to be performed, either prior to installing the item or as a means of confirming that the item has been installed correctly and is functioning correctly.

Further it should be normal practice for equipment suppliers to maintain material and test records to ensure component traceability. These records should be available for external audit by the operator or independent competent party.





## 2. Scope and application

### 2.1 Scope

Provide a listing of standards and recommended practices, for use by Exploration & Production (E&P), companies to ensure integrity during the full life cycle of their wells.

The scope of this Standard is restricted to:

- The Netherlands and the Dutch Continental Shelf;

### 2.2 Application

Standard 44 will be applicable both onshore and offshore. It applies to both drilling a new well, work over & well intervention and de-commissioning operations.

## 3. Permanent Well Components

Chapter 3 addresses the Standards, Specifications, Recommended Practices and other documents that support the well integrity status over the full life-cycle up to the de-commissioning.

<b>Standards</b>	Applies to Standard 53 & Standard 65-2
<b>S</b>	means Specification
<b>RP</b>	means Recommended Practice
<b>TR</b>	means Technical Report
<b>Bull</b>	means Bulletin
<b>Publ</b>	means Publication

### 3.1 Quality Management

API	DATE	DESCRIPTION	ISO	YEAR
S Q1	06/2013	Specification for Quality Management System Requirements for <b>Manufacturing</b> Organizations for the Petroleum and Natural Gas Industry		
S Q2	12/2011	Specification for Quality Management System Requirements for <b>Service Supply</b> Organizations for the Petroleum and Natural Gas Industries		

### 3.2 Tubular Goods

API	DATE	DESCRIPTION	ISO	YEAR
RP 5A3	09/2009	Recommended Practice on Thread Compounds for Casing, Tubing, Line Pipe, and Drill Stem Elements	13678	2010
RP 5A5	05/2005	Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe	15463	2003
S 5B	04/2008	Specification for Threading, Gauging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads	10422	
RP 5B1	08/1999	Gauging & Inspection of Casing, Tubing and L. P. Threads	13679	2002
RP 5C1	05/1999	Recommended Practice Care and Use of Casing and Tubing	10405	
TR 5C3	12/2008	Technical Report on Equations and Calculations for Casing, Tubing, and Line Pipe used as Casing or Tubing; Performance Properties for Casing & Tubing	10400	2007
RP 5C5	07/2003	Recommended Practice on Procedures for Testing Casing and Tubing Connections	13679	2002
RP 5C6	03/2006	Welding Connections to Pipe		
S 5CRA	02/2010	Specification for Corrosion Resistant Alloy Seamless Tubes for Use as Casing, Tubing and Coupling Stock	13680	2010
S 5CT	07/2011	Specification for Casing and Tubing	11960	

### 3.3 Valves and Wellhead Equipment

API	DATE	DESCRIPTION	ISO	YEAR
S 6A	10/2010	Specification for Wellhead and X-mas Tree Equipment	10423	2009
S 6AV1	02/2013	Specification for <b>Validation</b> of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service	10433	
S 6AV2	03/2014	Specification for <b>Installation, Maintenance and Repair</b> of Surface Safety Valves and Underwater Safety Valves Offshore	10419	

### 3.4 Oil Well Cements

API	DATE	DESCRIPTION	ISO	YEAR
S 10A	12/20 10	Specification for Cements and Materials for Well Cementing	10426-1	2009
RP 10B-2	04/20 13	Recommended Practice for Testing Well Cements	10426-2	2003
RP 10B-4	07/20 04	Recommended Practice on Preparation and Testing of Foamed Cement Slurries at Atmospheric Pressure	10426-4	2004
RP 10B-5	04/20 05	Recommended Practice on Determination of Shrinkage and Expansion of Well Cement Formulations at Atmospheric Pressure	10426-5	2004
RP 10B-6	08/20 10	Recommended Practice on Determining the Static Gel Strength of Cement Formulations	10426-6	2008
S 10D	03/20 02	Specification for Bow-Spring Casing Centralizers	10427-1	2001
RP 10D-2	08/20 04	Recommended Practice for Centralizer Placement and Stop Collar Testing	10427-2	2004
RP 10F	04/20 02	Recommended Practice for Performance Testing of Cementing Float Equipment	10427-3	2003
TR 10TR1	09/20 08	Cement Sheath Evaluation		
TR 10TR2	07/19 97	Shrinkage and Expansion in Oilwell Cements		
TR 10TR3	05/19 99	Technical Report on Temperatures for API Cement Operating Thickening Time Tests		
TR 10TR4	05/20 08	Selection of Centralizers for Primary Cementing Operations		
TR 10TR5	05/20 08	Methods for Testing of Solid and Rigid Centralizers		
STANDARD 65-2	12/20 10	Isolating Potential Flow Zones During Well Construction		

### 3.5 Safety and Anti-Pollution

API	DATE	DESCRIPTION	ISO	YEAR
S 11D1	07/2009	Specification for Packers and Bridge Plugs	14310	2008
S 14A	01/2015	Specification for Subsurface Safety Valve Equipment	10432	2004
RP 14B	10/2005	Design, Installation, Repair and Operation of Subsurface Safety Valve Systems	10417	2004
RP 14C	03/2001	Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms		
S 14L	07/2007	Specification Lock-Mandrels & Landing Nipples	16070	2005

### 3.6 Subsea Production Systems

API	DATE	DESCRIPTION	ISO	YEAR
RP 17A	01/2006	Design and Operation of Subsea Production Systems—General Requirements and Recommendations	13628-1	2010
S 17D	05/2011	Specification for Design and Operation of Subsea Production Systems—Subsea Wellhead and Tree Equipment	13628-4	2010
S 17E	10/2010	Specification for Subsea Umbilicals	13628-5	2009
S 17F		Specification Subsea Production Control Systems	13628-6	2006
RP 17G	07/2006	Recommended Practice for Completion/Workover Riser	13628-7	2005
RP 17H	06/2013	Remotely Operated Tools and Interfaces on Subsea Production Systems	13628-8	2002
RP 17N	03/2009	Subsea Production System Reliability and Technical Risk Management		
RP 17O	07/2014	Recommended Practice for Subsea High Integrity Pressure Protection Systems (HIPPS)		
RP 17P	01/2013	Design and Operation of Subsea Production Systems—Subsea Structures and Manifolds	13628-1	2005
RP 17Q	06/2010	Subsea Equipment Qualification—Standardized Process for Documentation		

### 3.7 Supply Chain Management

API	DATE	DESCRIPTION	ISO	YEAR
S 20D	09/2013	Specification for Nondestructive Examination Services for Equipment Used in the Petroleum and Natural Gas Industry		
S 20E	08/2012	Specification for Alloy and Carbon Steel Bolting for Use in the Petroleum and Natural Gas Industries		

### 3.8 Drilling & Production Operations

API	DATE	DESCRIPTION	ISO	YEAR
RP 31A	08/1997	Standard Form for Hardcopy Presentation of Downhole Well Log Data		
RP 45	08/1998	Recommended Practice for Analysis of Oilfield Waters		
RP 50	12/1995	Natural Gas Processing Plant Practices for Protection of the Environment		
RP 51	03/2001	Onshore Oil and Gas Production Practices for Protection of the Environment		
RP 51R	07/2009	Environmental Protection for Onshore Oil and Gas Production Operations and Leases		
RP 52	07/1995	Land Drilling Practices for Protection of the Environment		
<b>STANDARD</b> 53	11/2012	Blowout Prevention Equipment Systems for Drilling Wells	13533	2001
RP 68	01/1998	Recommended Practice for Oil and Gas Well Servicing and Workover Operations Involving Hydrogen Sulfide		
RP 90	08/2006	Annular Casing Pressure Management for Offshore Wells		
RP 92U	11/2008	Underbalanced Drilling Operations		
Bull 97	12/2013	Well Construction Interface Document Guidelines		
RP 98	08/2013	Personal Protective Equipment Selection for Oil Spill Responders		

3.9 HSE: General

API	DATE	DESCRIPTION	ISO	YEAR
Publ 4702	03/2001	Technologies to Reduce Oil and Grease Content of Well Treatment, Well Completion, and Workover Fluids for Overboard Disposal		
Bull E1	12/1990	Generic Hazardous Chemical Category List and Inventory for the Oil and Gas Exploration and Production Industry		
Bull E3	01/1993	Well Abandonment and Inactive Well Practices for U.S. Exploration and Production Operations, Environmental Guidance Document		
Bull E4	05/2003	Environmental Guidance Document: Release Reporting for the Oil and Gas Exploration and Production Industry as Required by the Clean Water Act, the Comprehensive Environmental Response, Compensation and Liability Act, and the Emergency Planning and Community		

**3.10 HSE: Naturally Occurring Radioactive Materials & Waste**

API	DATE	DESCRIPTION	ISO	YEAR
Publ 7102	10/1997	Methods for Measuring Naturally Occurring Radioactive Materials (NORM) in Petroleum Production Equipment		
Publ 7103	10/1997	Management and Disposal Alternatives for Naturally Occurring Radioactive Material (NORM) Wastes in Oil Production and Gas Plant Equipment		
Publ 7105	10/1997	Probabilistic Estimates of Dose and Indoor Radon Concentrations Attributable to Remediated Oilfield Naturally Occurring Radioactive Material (NORM)		
RP E5	02/1997	Environmental Guidance Document : Waste Management in E&P Operations		



## 4. Drilling Rig Equipment

Chapter 4 addresses the Standards, Specifications, Recommended Practices and other documents that support the well construction & work-over process.

### 4.1 Drilling Operations

API	DATE	DESCRIPTION	ISO	YEAR
RP 31A	08/1997	Standard Form for Hardcopy Presentation of Downhole Well Log Data		
RP 45	08/1998	Recommended Practice for Analysis of Oilfield Waters		
RP 50	12/1995	Natural Gas Processing Plant Practices for Protection of the Environment		
RP 51	03/2001	Onshore Oil and Gas Production Practices for Protection of the Environment		
RP 51R	07/2009	Environmental Protection for Onshore Oil and Gas Production Operations and Leases		
RP 52	07/1995	Land Drilling Practices for Protection of the Environment		
STANDARD 53	11/2012	Blowout Prevention Equipment Systems for Drilling Wells		
RP 90	08/2006	Annular Casing Pressure Management for Offshore Wells		
RP 92U	11/2008	Underbalanced Drilling Operations		
Bull 97	12/2013	Well Construction Interface Document Guidelines		
RP 98	08/2013	Personal Protective Equipment Selection for Oil Spill Responders		
S Q1	06/2013	Specification for Quality Management System Requirements for <b>Manufacturing</b> Organizations for the Petroleum and Natural Gas Industry		
S Q2	12/2011	Specification for Quality Management System Requirements for <b>Service Supply</b> Organizations for the Petroleum and Natural Gas Industries		

#### 4.2 Drilling Equipment

API	DATE	DESCRIPTION	ISO	YEAR
S 5DP	08/2009	Specification for Drill Pipe	11961	2008
S 7-1	02/2006	Specification for Rotary Drill Stem Elements	10424-1	2004
S 7-2	06/2008	Specification for Threading and Gauging of Rotary Shouldered Thread Connections	10424-2	2007
RP 7G	10/2010	Recommended Practice for Drill Stem Design and Operating Limits		
RP 7G-2	08/2009	Recommended Practice for Inspection and Classification of Drill Stem Element Inspection	10407-2	2008
S 7K	06/2010	Specification for Drilling and Well Servicing Equipment		
RP 7L	08/2012	Procedures for Inspection, Maintenance, Repair, and Remanufacture of Drilling Equipment		
S 7NRV	12/2012	Specification for Drill String Non-Return Valves		
S 5DP	08/2009	Specification for Drill Pipe	11961	2008

#### 4.3 Hoisting Equipment

API	DATE	DESCRIPTION	ISO	YEAR
S 8C	04/2012	Specification for Drilling & Production Hoisting Equipment (PSL 1 and PSL 2)		
S 9A	05/2011	Specification for Wire Rope		
RP 9B	10/2011	Application, Care, and Use of Wire Rope for Oil Field Service		

#### 4.4 Drilling Fluid Materials

API	DATE	DESCRIPTION	ISO	YEAR
RP13B-1	03/2009	Recommended Practice for Field Testing Water-Based Drilling Fluids	10414-1	2008
RP 13B-2	04/2014	Recommended Practice for Field Testing Oil-Based Drilling Fluids	10414-2	2011
RP 13D	05/2010	Rheology and Hydraulics of Oil-Well Fluids		
RP 13I	03/2009	Recommended Practice for Laboratory Testing of Drilling Fluids	10416	2008
RP 13M	07/2004	Recommended Practice for the Measurement of Viscous Properties of Completion Fluids	13503-1	2003

#### 4.5 Drilling Well Control Systems

API	DATE	DESCRIPTION	ISO	YEAR
S 16A	Under revision	Specification for Drill-Through Equipment	13533	2001
S 16C	Under revision	Specification for Choke and Kill Systems		
S 16D	Under revision	Specification for Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment		
S 16F	Under revision	Specification for Marine Drilling Riser Equipment		
RP 16Q	Under revision	Recommended Practice for Design, Selection, Operation and Maintenance of Marine Drilling Riser Systems		
S 16R	Under revision	Specification for Marine Drilling Riser Couplings		
S 16RCD	02/2005	Specification for Drill Through Equipment—Rotating Control Devices		
RP 16ST	03/2009	Coiled Tubing Well Control Systems		
RP 59	05/2006	Recommended Practice for Well Control Operations		
RP 64	10/2001	Recommended Practice for Diverter Systems		

		Equipment and Operations		
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#### 4.6 HSE: E&P Safety Standards

API	DATE	DESCRIPTION	ISO	YEAR
RP HF1	10/2009	Hydraulic Fracturing Operations—Well Construction and Integrity Guidelines		
RP HF2	06/2010	Water Management Associated with Hydraulic Fracturing		
RP HF3	01/2011	Practices for Mitigating Surface Impacts Associated with Hydraulic Fracturing		
RP 49	05/2001	Recommended Practice for Drilling and Well Service Operations Involving Hydrogen Sulfide		
RP 51R	07/2009	Environmental Protection for Onshore Oil and Gas Production Operations and Leases		
RP 54	08/1999	Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations		
RP 55	02/1995	Recommended Practice for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide	15156	2001
RP 67	05/2007	Recommended Practice for Oilfield Explosives Safety		
RP 75	05/2004	Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities		
Bull 75L	11/2007	Guidance Document for the Development of a Safety and Environmental Management System for Onshore Oil and Natural Gas Production Operations and Associated Activities		
RP 76	11/2007	Contractor Safety Management for Oil and Gas Drilling and Production Operations		

#### 4.7 Training

API	DATE	DESCRIPTION	ISO	YEAR
RP T-1	10/1995	Orientation Programs for Personnel Going Offshore for the First Time		
RP T-2	12/2001	Recommended Practice for Qualification Programs for Offshore Production Personnel Who Work with Safety Devices		
RP T-4	10/1995	Training of Offshore Personnel in Non-operating Emergencies		
RP T-6	10/2002	Recommended Practice for Training and Qualification of Personnel in Well Control Equipment and Techniques for Wireline Operations on Offshore Locations		
RP T-7	10/1995	Training of Personnel in Rescue of Persons in Water		

#### 4.8 Security

API	DATE	DESCRIPTION	ISO	YEAR
RP 70	03/2003	Security for Offshore oil and Natural Gas Operations		
RP 70I	04/2004	Security for Worldwide Offshore Oil and Natural Gas Operations Intended to assist the offshore oil and natural gas drilling and prod		

## 5. Well Intervention Equipment

Chapter 5 lists the Standards, Specifications, Recommended Practices and other documents that support the well intervention process.

### 5.1 Completion Equipment

API	DATE	DESCRIPTION	ISO	YEAR
S 11D1	07/2009	Specification for Packers and Bridge Plugs	14310	2008
RP 19C		Measurement of Properties of Proppants Used in Hydraulic Fracturing and Gravel-Packing Operations	13503-2	2006
RP 19D		Measuring the Long-Term Conductivity of Proppants	13503-5	2006
S 19V	05/2013	Specification for Subsurface Barrier Valves and Related Equipment	28781	2010

### 5.2 Well Intervention Equipment

API	DATE	DESCRIPTION	ISO	YEAR
RP 68	01/1998	Recommended Practice for Oil and Gas Well Servicing and Workover Operations Involving Hydrogen Sulfide		
S 16A	Under revision	Specification for Drill-Through Equipment	13533	2001
RP 16ST	03/2009	Coiled Tubing Well Control Equipment Systems		
<i>API RP 5C7 (Coiled Tubing Operations in Oil and Gas Well Services) has been cancelled by the API organization</i>				
RP 17G	07/2006	Recommended Practice for Completion/Workover Riser	13628-7	2005
RP 59	05/2006	Recommended Practice for Well Control Operations		
S 7K	06/2010	Specification for Drilling and Well Servicing Equipment		

### 5.3 HSE: Well Services

API	DATE	DESCRIPTION	ISO	YEAR
S Q1	06/2013	Specification for Quality Management System Requirements for <b>Manufacturing</b> Organizations for the Petroleum and Natural Gas Industry		
S Q2	12/2011	Specification for Quality Management System Requirements for <b>Service Supply</b> Organizations for the Petroleum and Natural Gas Industries		
Publ 4702	03/2001	Technologies to Reduce Oil and Grease Content of Well Treatment, Well Completion, and Workover Fluids for Overboard Disposal		

### 5.4 HSE: Naturally Occurring Radioactive Materials & Waste

API	DATE	DESCRIPTION	ISO	YEAR
Publ 7102	10/1997	Methods for Measuring Naturally Occurring Radioactive Materials (NORM) in Petroleum Production Equipment		
Publ 7103	10/1997	Management and Disposal Alternatives for Naturally Occurring Radioactive Material (NORM) Wastes in Oil Production and Gas Plant Equipment		
Publ 7105	10/1997	Probabilistic Estimates of Dose and Indoor Radon Concentrations Attributable to Remediated Oilfield Naturally Occurring Radioactive Material (NORM)		
RP E5	02/1997	Environmental Guidance Document : Waste Management in E&P Operations		

### 5.5 Security

API	DATE	DESCRIPTION	ISO	YEAR
RP 70	03/2003	Security for Offshore oil and Natural Gas Operations		
RP 70I	04/2004	Security for Worldwide Offshore Oil and Natural Gas Operations Intended to assist the offshore oil		

		and natural gas drilling and prod		
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## Annex I Well Life Cycle Integrity Guidelines



Well Life Cycle  
Integrity Guidelines



## Annex II Other ISO Standards for use in Oil & Gas Industry

**Standards in purple issued in 2015**  
**Standards in blue are a priority for 2016 issue**

These ISO standards, 18 and 73, are connected to ISO 9001, but only a core collection of several hundreds of standards available for the oil & gas industry from ABNT, ANSI, API, AS, BSI, CSA, DIN, DKE, NF, SAE, SAC, etc. Since ISO 73:2015 standards have been withdrawn and the relevant API standard is referenced above.