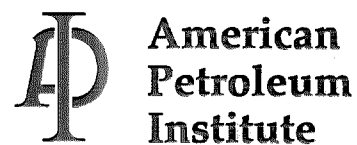


Recommended Practices for Blowout Prevention Equipment Systems for Drilling Wells

Exploration and Production Department

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FOREWORD

These recommended practices were prepared by the API Subcommittee on Blowout Prevention Equipment Systems. They represent a composite of the practices employed by various operating and drilling companies in drilling operations. In some cases, a reconciled composite of the various practices employed by these companies was utilized. This publication is under the jurisdiction of the American Petroleum Institute, Exploration & Production Department's Executive Committee on Drilling and Production Practices.

API Recommended Practice 53, First Edition, February 1976, superseded and replaced API Bulletin D13, *Installation and Use of Blowout Preventer Stacks and Accessory Equipment*, February 1966. The Second Edition was issued in May 1984.

Drilling operations are being conducted with full regard for personnel safety, public safety, and preservation of the environment in such diverse conditions as metropolitan sites, wilderness areas, ocean platforms, deep water sites, barren deserts, wildlife refuges, and arctic ice packs. Recommendations presented in this publication are based on this extensive and wide ranging industry experience.

The goal of these voluntary recommended practices is to assist the oil and gas industry in promoting personnel safety, public safety, integrity of the drilling equipment, and preservation of the environment for land and marine drilling operations. These recommended practices are published to facilitate the broad availability of proven, sound engineering and operating practices. This publication does not present all of the operating practices that can be employed to successfully install and operate blowout preventer systems in drilling operations. Practices set forth herein are considered acceptable for accomplishing the job as described; however, equivalent alternative installations and practices may be utilized to accomplish the same objectives. Individuals and organizations using these recommended practices are cautioned that operations must comply with requirements of federal, state, or local regulations. These requirements should be reviewed to determine whether violations may occur.

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Users of recommendations set forth herein are reminded that constantly developing technology and specialized or limited operations do not permit complete coverage of all operations and alternatives. Recommendations presented herein are not intended to inhibit developing technology and equipment improvements or improved operating procedures. These recommended practices are not intended to obviate the need for qualified engineering and operations analyses and sound judgments as to when and where these recommended practices should be utilized to fit a specific drilling application.

This publication includes use of the verbs *shall* and *should*, whichever is deemed the most applicable for the specific situation. For the purposes of this publication, the following definitions are applicable:

Shall: Indicates that the recommended practice(s) has universal applicability to that specific activity.

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 under certain circumstances or applications.

Changes in the uses of these verbs are not to be effected without risk of changing the intent of recommendations set forth herein.

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CONTENTS

	Page
1 SCOPE.....	1
1.1 Purpose	1
1.2 Well Control	1
1.3 BOP Installations	1
1.4 Equipment Arrangements.....	1
1.5 Low Temperature Operations.....	1
1.6 In-the-field Control System Accumulator Capacity.....	1
2 REFERENCES	1
2.1 Standards.....	1
2.2 Other References	2
3 DEFINITIONS AND ABBREVIATIONS	2
3.1 Definitions.....	2
3.2 Acronyms and Abbreviations	5
4 DIVERTER SYSTEMS—SURFACE BOP INSTALLATIONS.....	5
4.1 Purpose	5
4.2 Equipment and Installation Guidelines	5
5 DIVERTER SYSTEMS—SUBSEA BOP INSTALLATIONS	6
5.1 Purpose	6
5.2 Equipment and Installation Guidelines	6
6 SURFACE BOP STACK ARRANGEMENTS	6
6.1 Example BOP Stack Arrangements	6
6.2 Stack Component Codes	7
6.3 Ram Locks	7
6.4 Spare Parts	7
6.5 Parts Storage.....	7
6.6 Drilling Spools	7
7 SUBSEA BOP STACK ARRANGEMENTS.....	7
7.1 Example BOP Stack Arrangements	7
7.2 Stack Component Codes	13
7.3 Subsea BOP Stack Arrangements	13
7.4 Spare Parts	13
7.5 Parts Storage.....	13
7.6 Drilling Spools	13
8 CHOKE MANIFOLDS AND CHOKE LINES—SURFACE BOP INSTALLATIONS	14
8.1 General	14
8.2 Installation Guidelines—Choke Manifold.....	14
8.3 Installation Guidelines—Choke Lines.....	14
8.4 Maintenance	15
8.5 Spare Parts	17

	Page	
9	CHOKE MANIFOLDS—SUBSEA BOP INSTALLATIONS	17
9.1	General	17
9.2	Installation Guidelines	17
9.3	Maintenance	19
9.4	Spare Parts	19
10	KILL LINES—SURFACE BOP INSTALLATIONS	19
10.1	Purpose	19
10.2	Installation Guidelines	19
10.3	Maintenance	21
10.4	Spare Parts	21
11	CHOKE AND KILL LINES—SUBSEA BOP INSTALLATIONS	21
11.1	General	21
11.2	Installation Description	21
11.3	Installation Guidelines	21
11.4	Maintenance	23
11.5	Spare Parts	23
12	CONTROL SYSTEMS FOR SURFACE BOP STACKS	23
12.1	General	23
12.2	Accumulator Systems	27
12.3	Accumulator Volumetric Capacity	27
12.4	Pump Systems	27
12.5	BOP Control System Valves, Fittings, Lines, and Manifold	28
12.6	Control System Fluids and Capacity	29
12.7	Hydraulic Control Unit Location	29
12.8	Remote Control Stations	29
13	CONTROL SYSTEMS FOR SUBSEA BOP STACKS	29
13.1	General	29
13.2	Accumulator Systems	29
13.3	Accumulator Volumetric Capacity	29
13.4	Pump Systems	32
13.5	Remote Control and Monitoring Panels	32
13.6	Umbilical Control hose Bundles and Subsea Accumulators	32
13.7	Hose Reels and Hose Sheaves	32
13.8	Subsea Control Pods	33
13.9	BOP Control System Valves, Fittings, Lines, and Manifold	33
13.10	Control System Fluids and Capacity	33
14	ELECTRO-HYDRAULIC AND MULTIPLEX CONTROL SYSTEMS FOR SUBSEA BOP STACKS	34
14.1	General	34
14.2	Accumulator Volumetric Capacity	34
14.3	Pump Systems	35
14.4	Electrical Control Unit	35
14.5	Remote Control and Monitoring Panels	35

	Page
14.6 Subsea Umbilical Cables and Connectors	35
14.7 Subsea Electrical Equipment	36
15 AUXILIARY EQUIPMENT—SURFACE BOP INSTALLATIONS	36
15.1 Kelly Valves	36
15.2 Drill Pipe Safety Valve	36
15.3 Inside Blowout Preventer	36
15.4 Field Testing	36
15.5 Drill String Float Valve	36
15.6 Trip Tank	36
15.7 Pit Volume Measuring and Recording Devices	37
15.8 Flow Rate Sensor	37
15.9 Mud/Gas Separator	37
15.10 Degasser	37
15.11 Flare Lines	37
15.12 Stand Pipe Choke	37
15.13 Top Drive Equipment	38
16 AUXILIARY EQUIPMENT—SUBSEA BOP INSTALLATIONS	38
16.1 Kelly Valves	38
16.2 Drill Pipe Safety Valve	38
16.3 Inside Blowout Preventer	38
16.4 Field Testing	38
16.5 Drill String Float Valve	38
16.6 Trip Tank	38
16.7 Pit Volume Measuring and Recording Devices	39
16.8 Flow Rate Sensor	39
16.9 Mud/Gas Separator	39
16.10 Degasser	39
16.11 Flare Lines	39
16.12 Stand Pipe Choke	39
16.13 Top Drive Equipment	39
16.14 Guide Frames	39
16.15 Underwater Television	40
16.16 Slope Indicator	40
16.17 Pin Connector/Hydraulic Latch	40
16.18 Mud Booster Line	40
16.19 Auxiliary Hydraulic Supply Line (Hard/Rigid Conduit)	40
16.20 Riser Tensioning Support Ring	40
17 TESTING AND MAINTENANCE—SURFACE BOP STACKS AND WELL CONTROL EQUIPMENT	40
17.1 Purpose	40
17.2 Types of Tests	40
17.3 Test Criteria	41
17.4 Diverter System	45
17.5 Surface BOP Stack Equipment	45
17.6 Chokes and Choke Manifolds	46
17.7 Accumulator System	46

	Page
17.8 Auxiliary Equipment	46
17.9 Mud/Gas Separator	46
17.10 Inspections	46
17.11 Maintenance	47
17.12 Quality Management	48
17.13 Records and Documentation	48
18 TESTING AND MAINTENANCE—SUBSEA BOP STACKS AND WELL CONTROL EQUIPMENT	48
18.1 Purpose	48
18.2 Types of Tests	48
18.3 Test Criteria	50
18.4 Diverter System	52
18.5 Subsea BOP Stack Equipment	55
18.6 Chokes and Choke Manifolds	55
18.7 Accumulator System	55
18.8 Auxiliary Equipment	56
18.9 Mud/Gas Separator	56
18.10 Inspections	56
18.11 Maintenance	56
18.12 Quality Management	57
18.13 Records and Documentation	58
19 BOP SEALING COMPONENTS	58
19.1 Flanges and Hubs	58
19.2 Equipment Marking	58
19.3 Ring-joint Gaskets	58
19.4 Bolting	58
19.5 Elastomeric Components	60
19.6 Elastomeric Components for Hydrogen Sulfide Service	60
19.7 Integral Choke and Kill Lines	60
19.8 Subsea Wellhead Connector	60
19.9 Marine Riser	60
19.10 Subsea Control System	60
20 BLOWOUT PREVENTERS FOR HYDROGEN SULFIDE SERVICE	61
20.1 Applicability	61
20.2 Equipment Modifications	61
21 PIPE STRIPPING ARRANGEMENTS—SURFACE BOP INSTALLATIONS	61
21.1 Purpose	61
21.2 Equipment	61
21.3 Personnel Preparedness	62
21.4 Surface Equipment	62
21.5 Subsurface Equipment	62

	Page
22 PIPE STRIPPING ARRANGEMENTS—SUBSEA BOP INSTALLATIONS	64
22.1 Purpose	64
22.2 Equipment	64
22.3 Personnel Preparedness	64
22.4 Equipment at the Surface	64
22.5 Subsurface Equipment	65

APPENDIX A—FORMS

FORM 53-4, Subsea Accumulator Function Test Worksheet	69
FORM 53-5, Subsea Accumulator Closing Test Worksheet	70
FORM 53-2, Surface Accumulator Closing Test Worksheet	71

Figures:

1 Example Arrangement for 2K Rated Working Pressure Service— Surface BOP Installations	8
2 Example Arrangement for 3K and 5K Rated Working Pressure Service— Surface BOP Installations	9
3 Example Arrangement for 10K, 15K, and 20K Working Pressure Service— Surface BOP Installations	10
4 Example Arrangements for 2K and 3K Rated Working Pressure Service— Subsea BOP Installations	11
5 Example Arrangement for 5K, 10K, and 15K Rated Working Pressure Service—Subsea BOP Installations	12
6 Example Choke Manifold Assembly for 2K and 3K Rated Working Pressure Service—Surface BOP Installations	15
7 Example Choke Manifold Assembly for 5K Rated Working Pressure Service—Surface BOP Installations	16
8 Example Choke Manifold Assembly for 10K, 15K, and 20K Rated Working Pressure Service—Surface BOP Installations	16
9 Example Choke and Kill Manifold for 5K, 10K, and 15K Rated Working Pressure Service—Subsea BOP Installations	18
10 Example Kill Line Assembly for 2K and 3K Rated Working Pressure Service—Surface BOP Installations	20
11 Example Kill Line Assembly for 5K, 10K, and 15K Rated Working Pressure Service—Surface BOP Installations	20
12 Example Kill Line Assembly for 5K, 10K, and 15K Rated Working Pressure Service—Surface BOP Installations	20
13 Example Riser Mounted Kill and Choke Lines for Subsea BOP Installations	22
14 Example Subsea BOP Stack Illustrating Optional Locations for Kill/Choke Lines	24
15 Example Flexible Connection at the Top of Marine Riser for Kill/Choke Lines	25
16 Example Flexible Connection at the Bottom of Marine Riser for Kill/Choke Lines	26

	Page
17 Example Hydraulic Control Schematic for a BOP Control System	30
18 Example Standpipe Choke Installations	37
19 Example Illustration of Ram BOP Space Out	49
20 Example Illustration of Ram BOP Space Out	59
21 Example Surface BOP Stack/Choke Manifold Installation	63

Tables

1 Recommended Pressure Test Practices, Land and Bottom-supported Rigs (prior to spud or upon installation)	43
2 Recommended Pressure Test Practices, Land and Bottom-supported Rigs (not to exceed 21 days)	44
3 Recommended Pressure Test Practices, Floating Rigs with Subsea BOP Stacks (diverter system prior to spud, et al, prior to running stack)	53
4 Recommended Pressure Test Practices Floating Rigs with Subsea BOP Stacks [(a) BOP stack initially installed on wellhead and (b) not to exceed 21 days]:. .	54
5 Elastomer Compound Marking Code	60

Recommended Practices for Blowout Prevention Equipment Systems for Drilling Wells

1 Scope

1.1 PURPOSE

The purpose of these recommended practices is to provide information that can serve as a guide for installation and testing of blowout prevention equipment systems on land and marine drilling rigs (barge, platform, bottom-supported, and floating). Blowout prevention equipment systems are composed of all systems required to operate the blowout preventers (BOPs) under varying rig and well conditions. These systems are: blowout preventers (BOPs), choke and kill lines, choke manifold, hydraulic control system, marine riser, and auxiliary equipment. The primary functions of these systems are to confine well fluids to the wellbore, provide means to add fluid to the wellbore, and allow controlled volumes to be withdrawn from the wellbore. In addition, diverter systems are addressed in this Recommended Practice, though their primary purpose is to safely divert flow rather than to confine fluids to the wellbore. Refer to API Recommended Practice 64 for additional information on diverter systems. Marine risers are not dealt with in detail in this document. Refer to API Recommended Practice 16Q for additional information on marine drilling risers.

1.2 WELL CONTROL

Procedures and techniques for well control are not included in this publication since they are beyond the scope of equipment systems contained herein (refer to API Recommended Practice 59).

1.3 BOP INSTALLATIONS

In some instances, this publication contains a section pertaining to surface BOP installations followed by a section on subsea BOP installations. A delineation was made between *surface* and *subsea* equipment installations so these recommended practices would also have utility in floating drilling operations. Statements concerning surface equipment installations also generally apply to subsea equipment installations.

1.4 EQUIPMENT ARRANGEMENTS

Recommended equipment arrangements, as set forth in this publication, are adequate to meet specified well conditions. It is recognized that other arrangements may be equally effective and can be used in meeting well requirements and promoting safety and efficiency.

1.5 LOW TEMPERATURE OPERATIONS

Although operations are being conducted in areas of extremely low temperatures, a section specifically applicable to this service was not included since current practice generally results in protecting existing BOP equipment from this environment.

1.6 IN-THE-FIELD CONTROL SYSTEM ACCUMULATOR CAPACITY

It is important to distinguish between the standards for in-the-field control system accumulator capacity established here in Recommended Practice 53 and the design standards established in API Specification 16D.

API Specification 16D provides sizing guidelines for designers and manufacturers of control systems. In the factory, it is not possible to exactly simulate the volumetric demands of the control system piping, hoses, fittings, valves, BOPs, etc. On the rig, efficiency losses in the operation of fluid functions result from causes such as friction, hose expansion, control valve interflow as well as heat energy losses. Therefore, the establishment by the manufacturer of the design accumulator capacity provides a safety factor. This safety factor is a margin of additional fluid capacity which is not actually intended to be usable to operate well control functions on the rig.

For this reason, the control system design accumulator capacity formulas established in Specification 16D are different from the demonstrable capacity guidelines provided here in Recommended Practice 53.

The original control system manufacturer shall be consulted in the event that the field calculations or field testing should indicate insufficient capacity or in the event that the volumetric requirements of equipment being controlled are changed, such as by the modification or changeout of the BOP stack.

2 References

2.1 STANDARDS

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. All standards are subject to revision and users are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below: