

# Managed Pressure Drilling Operations — Pressurized Mud Cap Drilling with a Subsea Blowout Preventer

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## Introduction

These guidelines (recommended practices)—prepared by the IADC Underbalanced Operations (UBO) and Managed Pressure Drilling Committee, and consisting of representatives from various IADC member companies—represent a composite of the practices employed by various operating companies, service companies, and drilling contractors in managed pressure drilling operations. In some cases, a reconciled composite of the various practices employed by these companies was used. This publication is under the jurisdiction of the American Petroleum Institute, Drilling and Production Operations Subcommittee.

Managed pressure drilling operations are being conducted with full regard for personnel safety, public safety, and preservation of the environment in such diverse conditions as urban sites, wilderness areas, ocean platforms, deep-water sites, very hot barren deserts, and cold-weather areas, including the Arctic environment and wildlife refuges. As tools and equipment continually improve and develop, the technology has been applied in many geologic formations, including oil and gas reservoirs and on sour wells, thus driving the need for globally accepted standards and safe operating best practices.

# Managed Pressure Drilling Operations — Pressurized Mud Cap Drilling with a Subsea Blowout Preventer

## 1 Scope

This document addresses recommended practices for pressurized mud cap drilling (PMCD) from a floating rig with a subsea BOP stack. When massive lost circulation conditions are encountered, PMCD can be implemented to allow well construction operations to continue:

Although this document only addresses PMCD, most of the equipment described may also be used for the surface back-pressure (SBP) method of managed pressure drilling. However, much of the equipment used for SBP is not required for PMCD, and will not be covered here.

The following methods, described briefly, are also used during lost circulation conditions; however, they are outside the scope of this document:

- a) blind drilling (see 4.3.2);
- b) continuous annular injection drilling (see 4.3.3);
- c) floating mud cap drilling (see 4.3.4).

## 2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Standard 2RD, *Dynamic Risers for Floating Production Systems*

API Recommended Practice 16Q, *1st Edition, Recommended Practice for Design, Selection, Operation, and Maintenance of Marine Drilling Riser Systems*

## 3 Terms, Definitions, and Abbreviations

### 3.1 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1.1

##### **blind drilling**

A method where fluid is pumped down the drill string with no returns up the annulus.

#### 3.1.2

##### **common well barrier element**

Barrier element that is shared between the primary and secondary barrier envelopes.

#### 3.1.3

##### **continuous annular injection**

A method where fluid is continuously pumped down the drill string and the annulus.

#### 3.1.4

##### **equivalent circulating density**

##### **ECD**

Equivalent circulating density is the effective density of the circulating fluid in the wellbore resulting from the sum of the pressure imposed by the static fluid column, friction pressure, and surface back-pressure.