Appendix A: Drilling Blowout Prevention Systems

Blow-Out Prevention Stack

CLASS A

Surface Casing Depth - 1,800 metres (14,000-21,000 kPa).

Drilling Blowout Prevention System for Wells not exceeding a True Vertical Depth of 1,800 metres.

Minimum pressure rating: 14,000 kPa (2,000 psi).

Accumulator System

Notes:

- Bleed-off line, centreline through choke manifold, and flare line must be a minimum nominal diameter of 76.2mm throughout.
- Lines through chokes must be a minimum nominal diameter of 50.8mm throughout.
- Kill line must be a minimum nominal diameter of 50.8mm throughout.
- Flanged pipe connections must be used from the drilling spool down to and including the connection to the choke manifold. The remainder of the choke manifold may contain threaded fittings.
- Minimum pressure rating for flares and degasser inlet lines is 14MPa.
- Hydraulic and manual valve positions in the bleed-off line may be interchangeable.
- Ram type BOPs manufactured with integral outlets may be used in place of drilling spool, but must be inspected and re-certified if significant flow occurs through the body.
CLASS B

1,800-3,000 metres.

Drilling Blowout Prevention System for Wells not exceeding a True Vertical Depth of 3,000 metres.

Minimum pressure rating 21,000 kPa (3,000 psi).

Bleed-off line, centreline through choke manifold, and flare line must be a minimum nominal diameter of 76.2mm throughout.

Lines through chokes must be minimum nominal diameter of 50.8mm throughout.

Kill line must be a minimum nominal diameter of 50.8mm throughout.

Flanged pipe connections must be used from the drilling spool to the last valve on the choke manifold, inclusive.

Welded flanges required to connect primary and emergency bleed-off lines.

Minimum pressure rating for flare and degasser lines is 14MPa.

Hydraulic and manual valve positions in the bleed-off line may be interchangeable.

Ram type BOPs manufactured with integral outlets may be used in place of the drilling spools, but must be re-certified if significant flow has occurred through the body.
CLASS C

3,000-5,500 metres.

Drilling Blowout Prevention System for Wells not exceeding a True Vertical Depth of 5,500 metres.

Minimum pressure rating 34,000 kPa (5,000 psi).

Accumulator System

Blow-out Prevention

Notes:
- Kill lines, bleed-off lines, choke manifold, and flare lines must be a minimum nominal diameter of 76.2mm throughout.
- Flanged pipe connections must be used from the drilling spool to the last valve on the choke manifold, inclusive.
- Minimum pressure rating for flare and degasser lines is 14MPa.
- Hydraulic and manual valve positions in the bleed-off line may be interchangeable.
- Ram type BOPs manufactured with integral outlets may be used in place of the drilling spools, but must be re-certified if significant flow has occurred through the body.

Manifold System
CLASS D

5,500 metres and deeper.

Drilling Blowout Prevention System for Wells exceeding a True Vertical Depth of 5,500 metres.

Minimum pressure rating 70,000 kPa (10,000 psi).

**Notes:**

- Kill lines, bleed-off lines, choke manifold, and flare lines must be a minimum nominal diameter of 76.2mm throughout.
- Flanged pipe connections must be used from the drilling spool to the last valve on the choke manifold, inclusive.
- Minimum pressure rating for flare and degasser lines is 14MPa.
- Hydraulic and manual valve positions in the bleed-off line may be interchangeable.
- Ram type BOPs manufactured with integral outlets may be used in place of the drilling spools, but must be re-certified if significant flow has occurred through the body.
- Other BOP stack configurations are acceptable, including the use of double gate rams. Stack must contain a minimum of 2 pipe rams and one blind ram.

Manifold System

From primary bleed off

To flare pittank

From secondary bleed off

To secondary mud-gas separator

76 mm (3") throughout, flanged connections throughout

To flare pittank

Accumulator System

To primary mud-gas separator

Vent (outside building)
Special Sour: All Depths

Drilling Prevention Systems for Special Sour Wells.

Minimum pressure rating 14,000 kPa (2,000 psi).

Note:

- Hydraulic and manual valve positions in bleed-off line are interchangeable.
- If BOP Configuration 2 or BOP Configuration 3 is used, an appropriately sized ram blanking tool fitting into the top pipe ram must be on location and readily available.
- If BOP Configuration 3 is used, there must be sufficient surface or intermediate casing to contain the maximum anticipated reservoir pressure.
- Shear blind rams may be required in place of the blind rams.
- Rams type BOPs manufactured with integral outlet may be used in place of the drilling spools, but must be re-certified if significant flow has occurred through the bodies.
Special Sour Manifold

Minimum pressure rating 14,000 kPa (2,000 psi).
Bleed off lines – All Classes

Alternative:

- R.O.P. valves
- Flanged tee
- Studded tee
- Welded tee

Class A B C D

50 cm maximum

Matting or ground level

78 mm (3"

50 mm FC flanged valve

Testing line (Optional: separate line may be used)

Studded tee Class A B C D

To choke manifold

Welded tee

Appendix B

leed off lines – All Classes
For all classes:

Class A, B, C and D diagrams indicate single ram preventer. The single blind ram preventer may be replaced with a double gate preventer.
Equipment Symbols

- **R** – Single ram type preventer with one set of blind or pipe ram.
- **A** – Annular-type blowout preventer.
- **S** – Drilling spool with flanged side outlet connections for bleed-off and kill lines.
- Flanged means weld necked flanges.
- A double gate blowout preventer may replace a single gate preventer but the lowest ram in any stack shall be a pipe ram.

Note:

- Nitrogen Reserve
- Accumulator
- Hydraulic Oil Reservoir
- Charge Pump
- Flanged Valve
- Threaded Valve
- Hydraulic Valve
- Adjustable Choke
- Hydraulic Choke
- Check Valve
- Bull Plug
- Pressure Gauge
- Flow Direction