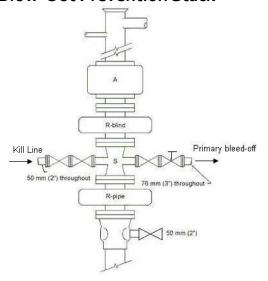
# Appendix A: Drilling Blowout Prevention Systems

#### **Blow-Out Prevention Stack**

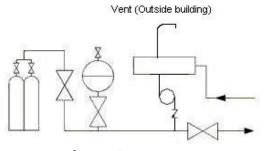


## **CLASS A**

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.

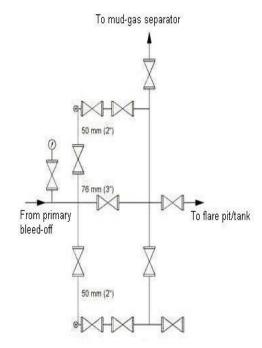
Minimum pressure rating: 14,000 kPa (2,000 psi).



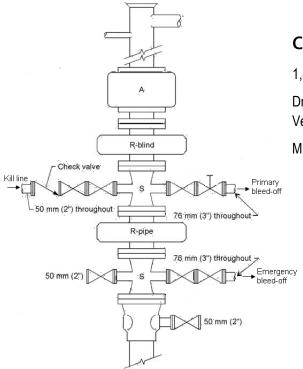
## **Accumulator System**

#### 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 recertified if significant flow occurs through the body.



**Choke Manifold** 

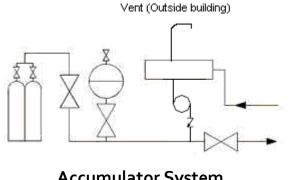


#### **CLASS B**

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).

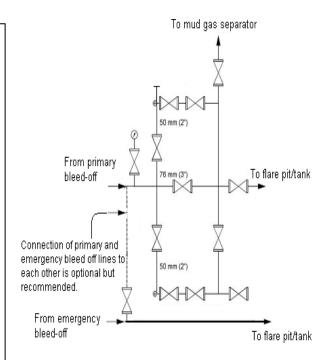


# **Accumulator System**

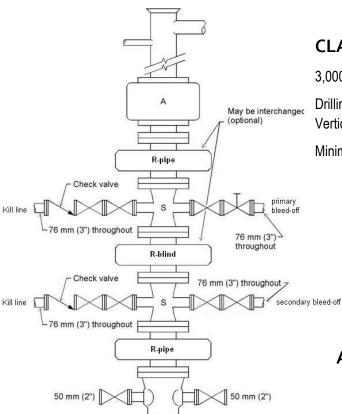
## **Blow-out Prevention Stack**

#### 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 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.



**Manifold System** 

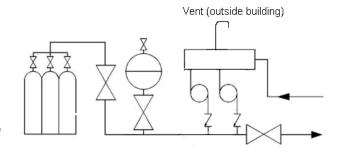


#### **CLASS C**

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).

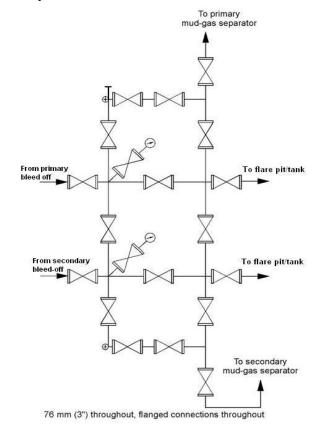


## **Accumulator System**

### **Blow-out Prevention Stack**

#### 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.



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#### **Blow-out Prevention Stack**

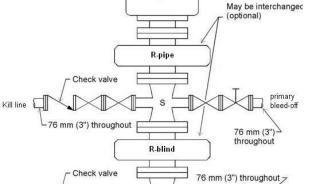
#### **CLASS D**

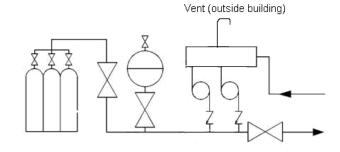
secondary bleed-off

5,500 metres and deeper.

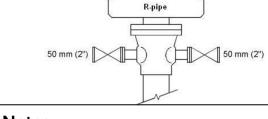
Drilling Blowout Prevention System for Wells exceeding a True Vertical Depth of 5,500 metres.

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







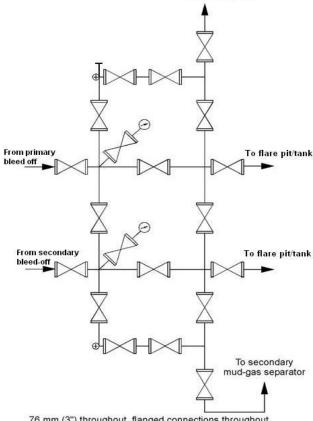


76 mm (3") throughout

#### Notes:

Kill line

- 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.



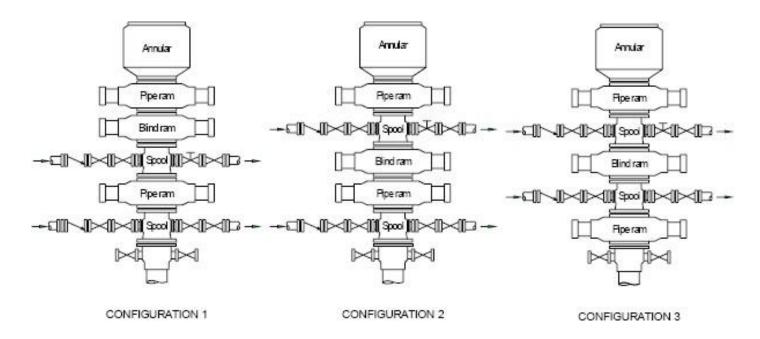
To primary mud-gas separator

76 mm (3") throughout, flanged connections throughout

## Special Sour: All Depths

Drilling Prevention Systems for Special Sour Wells.

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



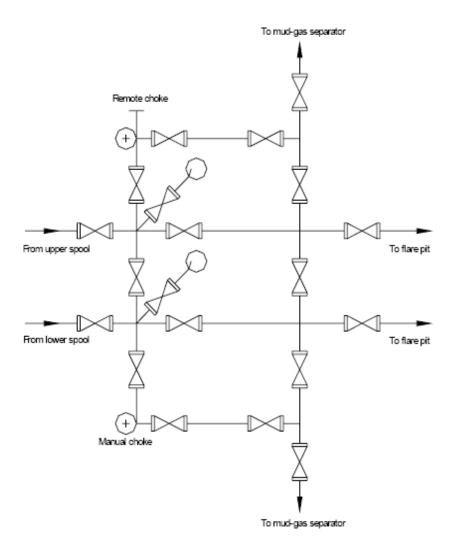
### Note:

- 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.

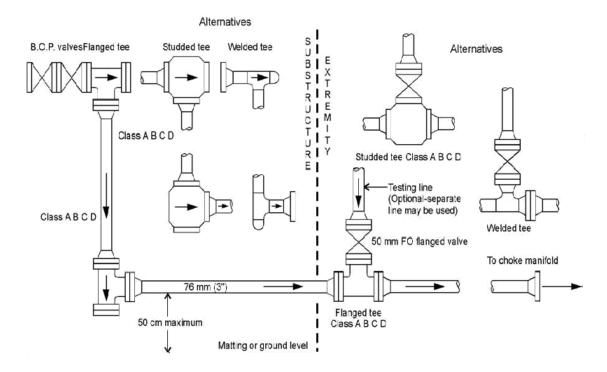
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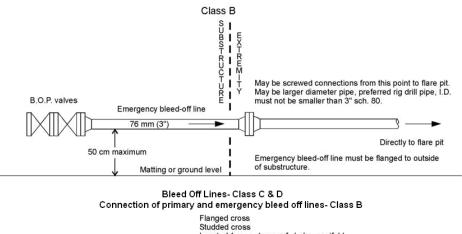
# **Special Sour Manifold**

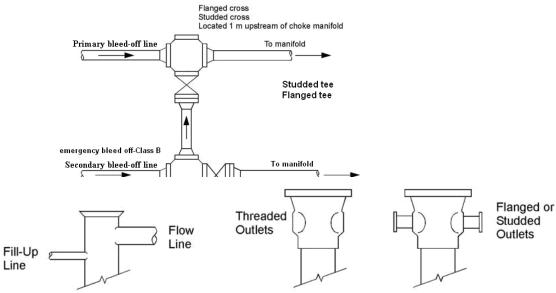
Minimum pressure rating 14,000 kPa (2,000 psi).



## Bleed off lines - All Classes







## For all classes:

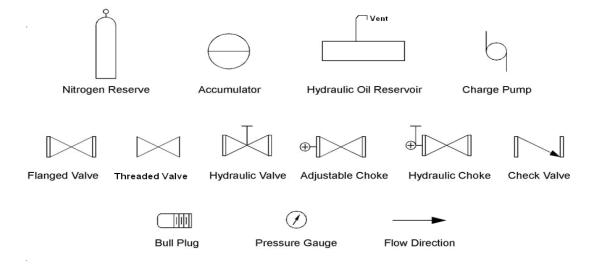
Flow Tee

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

Casing Bowls

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# **Equipment Symbols**



#### Note:

- 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.

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