

SONAT EXPLORATION

West ~~TEXAS~~ TEXAS BUSINESS UNIT

Minimum Requirements for a 5,000 psi BOP Stack Manifold & Closing System

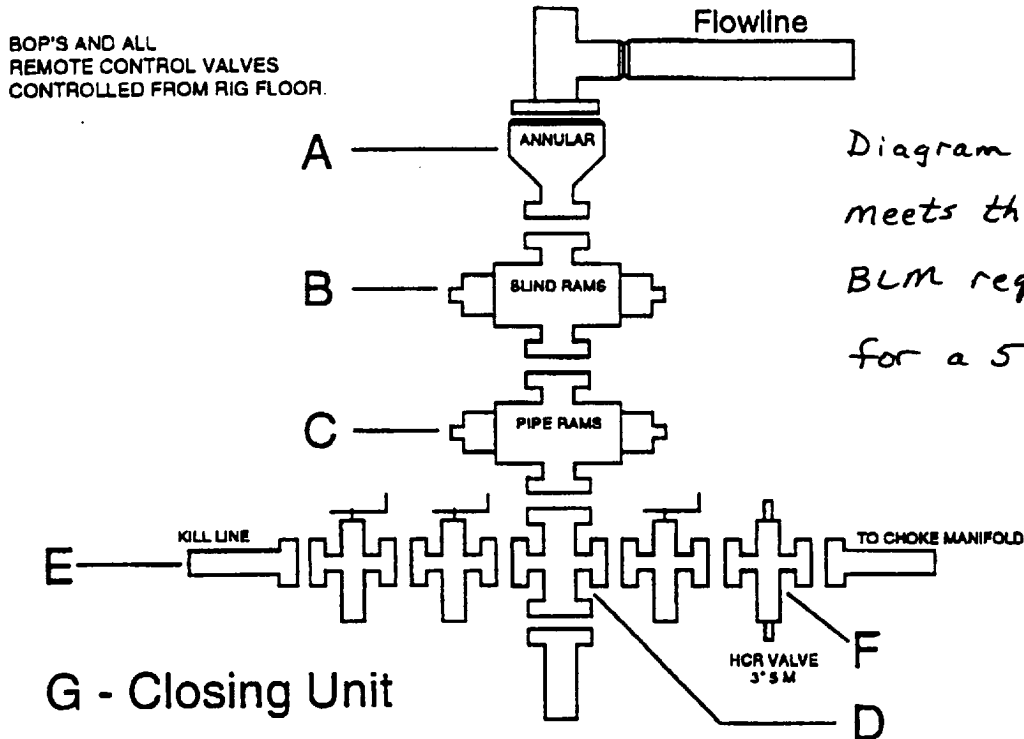


Diagram as shown
meets the minimum
BLM requirements
for a 5M stack.

- A. Annular BOP Must be 5000 psi Working Pressure.
- B. Blind Rams Between Annular & Pipe Rams w/ 5000 psi Working Pressure.
- C. Pipe Rams Below Blind Rams w/ 5000 psi Working Pressure.
Note: All Rams & Spools Must Meet Required I.D. for Hole Size.
- D. Drilling Spool w/ 2 Outlets for Choke Line & Kill Line
- E. Kill Line 2" 5M w/ 2 Manual Valves Bolted & Flanged Below Bottom Pipe Rams. Either A Drilling Spool or the Outlet on the BOP Stack can be Used to Accommodate Kill Line and Choke Line.
- F. Choke Line w/ 3" 5 M Valves. Inside Valve can be Manual but the Outside Valve Must be Hydraulic (HCR). Choke Line Must be 3" 5 M.
- G. Closing Unit (Koomey) w/ a Primary & Secondary Pressure Supply to Operate the BOP Stack. Also a N₂ Supply will be Provided as a Final Source of Operation to Close the BOP Stack. This Unit is Required to Contain a Minimum of 1 1/2 Times the Needed Volume to Operate the BOP Stack at All Times. The Precharge of N₂ will be Checked Prior to Contractor Commencing Work for SONAT.