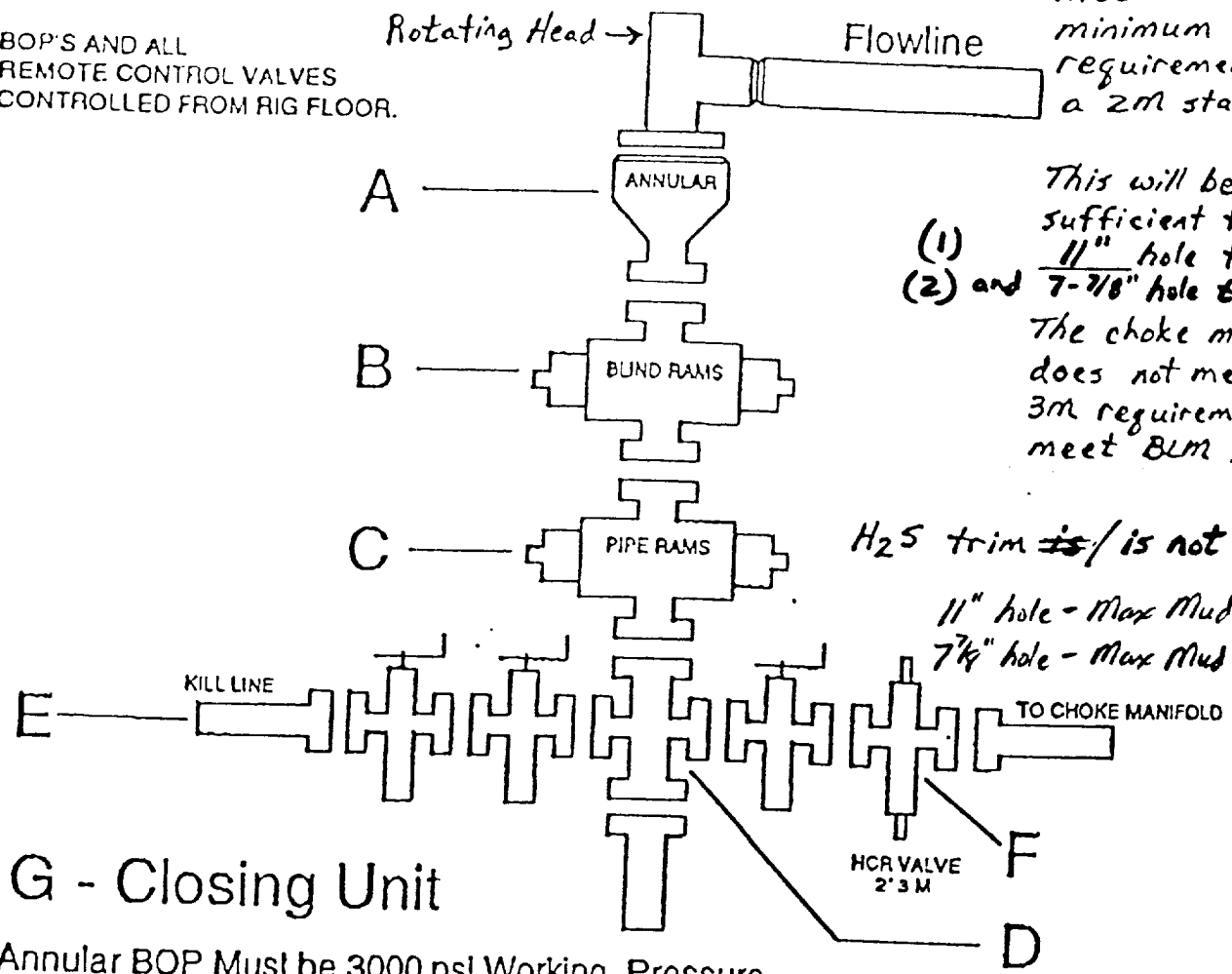


SOUTH TEXAS BUSINESS UNIT

Minimum Requirements for a 3,000 psi BOP Stack Manifold & Closing System

Stack Manifold & Closing System - meets the minimum BLM requirements for a 2M stack only.

BOP'S AND ALL REMOTE CONTROL VALVES CONTROLLED FROM RIG FLOOR.



This will be sufficient for the
 (1) 11" hole to 4300'
 (2) and 7-7/8" hole to TD.
 The choke manifold does not meet all 3M requirements to meet BLM specs.

H₂S trim ~~is~~/is not required.
 11" hole - Max Mud Wt 10 ppG
 7 7/8" hole - Max Mud Wt 8.5 ppG

G - Closing Unit

- A. Annular BOP Must be 3000 psi Working Pressure.
- B. Blind Rams Between Annular & Pipe Rams w/ 3000 psi Working Pressure.
- C. Pipe Rams Below Blind Rams w/ 3000 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" 3 M 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/ 2" 3 M Valves. Inside Valve can be Manual but the Outside Valve Must be Hydraulic (HCR). Choke Line Must be 2" 3 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 Commencing Work for SONAT.