Texas Pumpdown & Torque Solutions, LLC

BOP Test Procedures

4/10/2013

Nipple up / Rig up procedures

(From the Crown Valve up)

The nipple up/rig up procedure is a combined effort of the Pressure Control/Lubrication (PCL), Crane and XPAT crews. The XPAT nipple up/ rig up procedures from the Crown Valve up are as follows:

1. Ensure that all valves (#1 master, #2 master, all four wing valves and the crown valve) are closed.
2. Assemble the Torq/lite Inline Ratcheting hydraulic torque unit (hoses and correct torque tool) and load it into aerial lift basket.
3. Load misc. tools into the aerial lift basket. (crescent wrench, 2 lb. hammer and back-up hammer wrenches, lifting eye, etc..).
4. Lay out the air hose and pump unit pressure hose, attach the air hose to the torque unit and air compressor and the pressure hose to the side of the aerial lift basket (ensure the correct whip checks are used and the crows feet attachments on the air hose are pinned in place). Ensure the hoses are placed in such a fashion that they are not a trip hazard and will not become entangled in any equipment, valves, etc. while being lifted into the air.
5. Attach a 4' or SRL lanyard and put on a four point harness and adjust it properly. (lanyards in excess of 4' or that have built-in shock absorbers are restricted. Do Not Use)
6. Start the air compressor and make sure all valves are in the desired position. Press the throttle button to increase engine RPM.
7. Step into the aerial lift basket and attach your lanyard to the approved anchor point within the basket. Once all personnel within the basket are tied off, start the lift engine and maneuver the basket to the desired location.
8. Check the pressure gauge located on top of the night cap to ensure minimal pressure is present above the crown valve. Once it is established that the amount of pressure present is safe, open the bleed off valve slowly to release any negligible pressure.
9. Once all pressure has dissipated, remove the gauge and valve and replace it with the lifting eye.
10. Using the torque unit, loosen all of the (top) fasteners (nuts) that are securing the night cap. (The torque unit settings will need to be in excess of the pressure in which the fasteners (nuts) where installed. A pressure in excess of 4500 psi is usually sufficient)
11. Remove the (bottom) fasteners (nuts) from the studs that are securing the night cap and place them in the aerial lift basket for future use.
12. Direct the crane operator to place the lifting hook directly above the night cap and attach it to the lifting eye using a choker of sufficient size and strength (per OSHA and ANSI requirements). Once the night cap is attached to the crane lifting hook and all required fasteners (nuts) are removed direct the crane operator to slowly lift the cap from its seat and lower it onto a clean surface so the studs do not become coated with dirt and debris.

    Once the night cap is resting on the clean surface and detached from the crane the PCL crew will attach the crane lifting hook to the top of the lifting cap on the tool trap which is mounted to the top of the BOP. They will then direct the crane operator to lift the assembly and hold it suspended while they remove the fasteners from the night cap and install them on the bottom flange of the spool which is attached to the bottom of the BOP. They will then install the flow back valves and piping to the outlet located mid- way on the spool. Once this is completed they will direct the crane operator to lift the entire assembly into place on top of the crown valve.
13. Clean the gasket seat in the top of the crown valve flange and install a new gasket supplied by the PCL operator.
14. Once the BOP assembly is within close (within 1" to 1 1/2") proximity of the top flange on the crown valve manipulate the assembly so that it is facing the direction desired by the PCL operator. Once the correct bolt alignment is achieved direct the crane operator to slowly lower the assembly into place while keeping your hands and fingers clear of all pinch hazards.
15. With the BOP assembly in place and supported by the crane reinstall the fasteners (nuts) to the bottom of the studs protruding thru the top flange of the crown valve. Tighten these fasteners (nuts) hand tight. Once all fasteners are hand tight torque all fasteners (top nuts) as required using the specifications as shown on the Torq/lite API Flange Slide Ruler. Set the required pressure on the Torq/lite Inline Ratcheting Hydraulic Torque Unit and starting on the side with the largest gap between the flanges, torque one (1) fastener (top nut) to the required pressure. Move 180

degrees and tighten another one (1) fastener to the required pressure. Moving clockwise around the flange starting with the second fastener tightened torque each subsequent fastener as required. Once all fasteners have been torqued all the way around to the initial starting point, skip two fasteners and check the pressure on four consecutive fasteners moving counter clockwise ensuring each meet torque requirements. Use the hammer wrench as back up on the bottom fastener (nut) if needed. Should the hammer wrench become lodged use the 2 lb. hammer to break it loose. Ensure that the wrench and hammer are secure and will not be dropped and/or fall once the wrench is broken free.

16. Maneuver the aerial lift basket up to the top of the BOP assembly and direct the crane operator to slowly lower the lifting hook so that it can be detached from the assembly.
17. Detach the crane lifting hook from the BOP assembly.
18. Lower the aerial lift basket to the top flange on the spool below the BOP.
19. Torque all fasteners (nuts) on the top spool flange (Refer to #15 for torque procedures).
20. Attach the 1502 hammer unit and high pressure needle valve to the spool located directly below the tool trap. Using the 2 lb. Hammer tighten it until it no longer moves and attach the 1/2" pump pressure hose to the needle valve assembly with the threaded coupling. (Use the correct whip check and support the hose so that no unnecessary weight/pressure is present on the valve assembly).
21. Lower the aerial lift basket to the ground being careful not to entangle any hoses or contact any of the well head valves or piping and unload all tools and equipment.
22. Test assembly as directed by the company representative.

4/10/2013

Nipple up / Rig up Procedures

(From the Wing valves up to and including the Crown Valve)

The nipple up/rig up procedure is a combined effort of the Emergency Well Control (EWC), Crane and XPAT crews. The XPAT nipple up/ rig up procedures from the Wing Valves up to and including the Crown Valve are as follows:

1. Ensure that all valves (#1 master, #2 master, all four wing valves and the crown valve) are closed.
2. Assemble the Torq/lite Inline Ratcheting hydraulic torque unit (hoses and correct torque tool) and load it into aerial lift basket.
3. Load misc. tools into the aerial lift basket. (crescent wrench, 2 lb. hammer and back-up hammer wrenches, lifting eye, etc..).
4. Lay out the air hose and pump unit pressure hose, attach the air hose to the torque unit and air compressor and the pressure hose to the side of the aerial lift basket (ensure the correct whip checks are used and the crows feet attachments on the air hose are pinned in place). Ensure the hoses are placed in such a fashion that they are not a trip hazard and will not become entangled in any equipment, valves, etc. while being lifted into the air.
5. Attach a 4' or SRL lanyard and put on a four point harness and adjust it properly. (lanyards in excess of 4' or that have built-in shock absorbers are restricted. Do Not Use)
6. Start the air compressor and make sure all valves are in the desired position. Press the throttle button to increase engine RPM.
7. Step into the aerial lift basket and attach your lanyard to the approved anchor point within the basket. Once all personnel within the basket are tied off, start the lift engine and maneuver the basket to the desired location.
8. Check the pressure gauge located on top of the night cap to ensure minimal pressure is present above the crown valve. Once it is established that the amount of pressure present is safe, open the bleed off valve slowly to release any negligible pressure.
9. Direct the crane operator to position the lifting hook directly above the night cap and position two slings on the crown valve, one on each side of the valve body around the stem assemblies. Once the slings are in place direct the crane operator to apply slight upward pressure until the slings are slightly snug.
10. Reposition the aerial lift basket so as to access the fasteners (nuts) on the bottom flange of the crown valve.
11. Using the torque unit, loosen all of the (top) fasteners (nuts) that are securing the crown valve. (The torque unit settings will need to be in excess of the pressure in which the fasteners (nuts) where installed. A pressure in excess of 4500 psi is usually sufficient). Remove the bottom fasteners (nuts) and place in the aerial lift basket for future use.
12. Direct the crane operator to raise the crown valve and position it over the goat head/main hydraulic valve assemblies as directed by the EWC crew.

    Once the crown valve is in position the EWC crew will attach it to the goat head/main hydraulic valve assembly and direct the crane operator to lift it back into position over wing valve assembly on the well head.
13. Clean the gasket seat on the wing valve cross and install a new gasket that is supplied by the EWC crew.
14. Once the crown, goat head, main hydraulic valve assembly is within close (within 1” to 1 1/2”) proximity of the top flange on the wing valve cross manipulate the assembly so that it is facing the direction desired by the EWC operator or company representative. Once the correct bolt alignment is achieved direct the crane operator to slowly lower the assembly into place while keeping your hands and fingers clear of all pinch hazards.
15. With the crown, goat head, main hydro assembly in place and supported by the crane reinstall the fasteners (nuts) to the bottom of the studs protruding thru the top flange of the wing valve cross. Tighten these fasteners (nuts) hand tight. Once all fasteners are hand tight torque all fasteners (top nuts) as required using the specifications as shown on the Torq/lite API Flange Slide Ruler. Set the required pressure on the Torq/lite Inline Ratcheting Hydraulic Torque Unit and starting on the side with the largest gap between the flanges, torque one (1) fastener (top nut) to the required pressure. Move 180 degrees and tighten another one (1) fastener to the required pressure. Moving clockwise around the flange starting with the second fastener tightened torque each subsequent fastener as required. Once all fasteners have been torqued all the way around to the initial starting point, skip two fasteners

and check the pressure on four consecutive fasteners moving counter clockwise ensuring each meet torque requirements. Use the hammer wrench as back up on the bottom fastener (nut) if needed. Should the hammer wrench become lodged use the 2 lb. hammer to break it loose. Ensure that the wrench and hammer are secure and will not be dropped and/or fall once the wrench is broken free.

16. Maneuver the aerial lift basket up to the top of the crown, goat head, hydro assembly and direct the crane operator to slowly lower the lifting hook so that the slings can be detached from the assembly.
17. Detach the crane lifting slings from the assembly.
18. Lower the aerial lift basket to the bottom flange of the crown valve.
19. Torque all fasteners (nuts) on the bottom crown valve flange (Refer to #15 for torque procedures).
20. Maneuver the aerial lift basket up to the top of the crown valve/night cap.
21. Check all night cap fasteners (nuts) to ensure the correct torque requirements and close the needle valve.
22. Maneuver the aerial lift basket to one side of the wing valves.
23. Loosen the fasteners (nuts) on the outer cap of the outer manual wing valve. Do not remove fasteners (nuts),leave them hand tight, the EWC crew will remove them once the valve is on the ground.
24. Loosen the fasteners (nuts) on the inner flange of the outer manual valve and direct the crane operator to lower the slings.
25. Place the slings of the valve as directed by the crane rigger and direct the crane operator to apply slight upward pressure to support the valve.
26. Remove the fasteners (nuts) on the outside of the inner valve flange so that the studs remain when the valve is removed. Place the fasteners into the aerial lift basket for future use.
27. Remove the outer manual wing valve and direct the crane operator to lower it to a location as directed by the EWC crew.
28. Repeat steps #22 thru #27 for removal of the outer manual wing valve on the opposite side of the well head.

    The EWC crew will rig the hydraulic wing valves and direct the crane operator to swing them into place.

29. Once the outer hydro wing valve gets within close proximity of the inner valve, align the studs being careful to keep your hands and fingers clear of all pinch hazards.
30. Move valve into place and reinstall the fasteners (nuts) tightening them hand tight.
31. Direct the crane operator to slowly lower the lifting hook and remove the slings.
32. Torque all fasteners (nuts) on the outer cap flange and inner valve flange. (Refer to #15 for torque procedures)
33. Repeat #29 thru #32 for the installation of the outer hyrdo wing valve on the opposite side of the well head.

4/16/2013

Well Pressure Equalization Procedures

Well pressure equalization above the frac and wing valves is necessary to facilitate the opening and closing of the valves. This occurs after the rig-up/nipple up, during well head testing , before fracturing, before the wireline and the well shut-in processes. The amount of pressure on the negative (top) side of the valve must be equal to or slightly above the amount of pressure being applied to the positive (bottom) side of the valve from the well. Equalization is achieved by pumping water into the negative void and applying pressure to that water using a 15,000 psi high pressure diesel pump. Once equalization is achieved the valves can then be opened and/or closed safely. XPAT's procedures for well pressure equalization are as follows:

1. Fill the two (2) 165 gal. pump unit water holding tanks with water.
2. Clean or replace the inline sock type water filter.
3. Using a hand held grease gun perform the following steps. (These steps are to be performed only once prior to the initial start up of each 15 to 18 stage fracing process)
   Apply four (4) pumps of grease into each of the three (3) pump cylinder grease hose fittings.
   Apply two (2) pumps of grease into the clutch lever shaft housing on both sides of the bell housing.
   Apply four (4) pumps of grease into the bell housing main shaft bearing.
4. Ensure that the diesel engine is full of oil, fuel and water.
5. Unroll the pressure hose and lay it on the ground in such a fashion that it is not a trip hazard or can become entangled while being hoisted into the air. Allow enough slack to reach the intended attachment point on the well head, manifold, BOP, spool etc..
6. Check the pressure hose couplings at all connections to ensure that they are tight.
7. Start the engine. While the engine is at idle and the water is bypassing thru the control valve back into the tank check for leaks (piston cylinder block, valve body, control valve block, gauges, suction and high pressure hose connections, etc.).
8. Turn off the engine
9. Attach a 4' or SRL lanyard and put on a four point harness and adjust it properly. (lanyards in excess of 4' or that have built-in shock absorbers are restricted. Do Not Use)
10. Secure the high pressure hose to the aerial lift basket. (if required to be attached at an elevated position).
11. Load misc. tools into the aerial lift basket. (crescent wrench, 2 lb. Hammer, etc..).
12. Step into the aerial lift basket and attach your lanyard to the approved anchor point within the basket.
    Once all personnel within the basket are anchored (tied off), start the lift engine and maneuver the basket to the desired location.
13. Attach the high pressure hose attachment fitting to the desired location on the well head, manifold, BOP, spool, etc.
14. Open the high pressure hose attachment needle valve to the fully open position.
15. Lower the aerial lift basket to a clear and safe location on the ground and unload all tools, etc. so that the basket is free of debris and safe for future personnel use.
16. Determine how and when the Pressure Control / Lubrication (PCL) Operator needs to be informed of the pressure increase.

Equalization after the fracturing stage

(With lubricator installed)

1. Determine the well pressure by acquiring this data from the rigger for the frac crew cherry picker after having removed the night cap and placed it on the ground.
2. Start the pump engine.
3. After determining from the PCL helper that the flow-back valves are in the closed position engage the pump engine clutch and depress the control valve lever.
4. With the control valve lever depressed increase the pump engine RPM to the desired level. (2200 to 2400 RPM).

5. Keep the control valve lever depressed until the pressure gauge needle moves from a steady position up 250 psi. (This normally takes around 5 min.)
6. Release the control valve lever.
7. Lightly depress the control valve lever and increase the pressure in increments of 1000 psi communicating with the lubricator helper as previously agreed. (Pause approx. 2 seconds after each 1000 psi increase)
8. Once the predetermined well pressure is achieved release the control valve handle, communicate this to the PCL helper, disengage the pump clutch, bring the pump engine rpm to an idle and turn off the engine.

Equalization after the wireline perforating stage

(With the night cap installed)

1. Determine the well pressure by monitoring it on the pump control valve gauge or by the gauge mounted on the PCL unit (if equipped)
2. Once the night cap has been installed and the bleed off needle valve closed start the pump engine.
3. After determining from the PCL helper that the flow-back valves are in the closed position engage the pump engine clutch lever and depress the control valve lever.
4. With the control valve lever depressed increase the pump engine RPM to the desired level (1500 to 2200 RPM).
5. Keep the control valve lever depressed until the pressure gauge needle moves from a steady position up 250 psi. (This normally takes around 1 ½ to 2 min.).
6. Release the control valve lever.
7. Lightly depress the control valve lever and increase the pressure in increments of 1000 psi until a pressure 400 psi above the predetermined well pressure is achieved. (Pause approx. 2 seconds after each 1000 psi increase)
8. Release the control valve lever, communicate this to the PCL helper, disengage the pump clutch, bring the pump engine rpm to an idle and turn off the engine.

Repeat the above procedures at each stage of the fracing process.

End of p rocedures

4/14/2013

Valve Greasing Procedures

Greasing of the valves occurs after the nipple up / rig up process, after the 5th , 10th and 15th frac stages, after the nipple down / rig down process and/or as directed by the company representative. The well head pressure must be equalized at all valves before the greasing process begins. Located on the side of the Frac valve front and/or rear stem housings and on the bottom of the wing valve front stem housing are greasing stems/ports. These are the stem/ports mentioned below onto which the grease hose attachment fitting is secured and thru which grease enters the valves. XPAT's valve greasing procedures are as follows:

1. Ensure that the trailer mounted grease unit air compressor has sufficient fuel and oil to complete the greasing process.
2. Drain all condensation (water) from the air compressor pressure tank and air line water trap.
3. Ensure that the unit is equipped with "Plusco - 87 High Temperature Graphite Grease" or an approved equal.
4. Start the air compressor on the grease unit. Allow it to run until the pressure is sufficient in the pressure tank that the unit slows to an idle. With the grease hose attachment fitting needle valve closed open the ball valve that supplies air to the grease pump and adjust the pressure on the pump so that it does not exceed the required amount of pressure necessary for the type of valves being greased (10,000 psi on the frac valves and 2500 psi on the wing valves)
5. Shut down the air compressor and bleed the pressure from the hose by opening the attachment end needle valve. (bleed the hose into a sufficient container so as not to release grease on the ground or trailer)
6. Load misc. tools into the aerial lift basket. (crescent wrench, 2 lb. Hammer, etc..).
7. Lay out the grease hose and attach (secure) it to the side of the aerial lift basket (ensure the correct whip checks are used). Ensure the hoses are placed in such a fashion that they are not a trip hazard and will not become entangled in any equipment, valves, etc. while being lifted into the air.
8. Attach a 4' or SRL lanyard and put on a four point harness and adjust it properly. (lanyards in excess of 4' or that have built-in shock absorbers are restricted. Do Not Use)
9. Step into the aerial lift basket and attach your lanyard to the approved anchor point within the basket. Once all personnel within the basket are tied-off, start the lift engine and maneuver the basket to the desired location so as to be able to reach the valve handle and/or grease stems without the need to gain additional height and remaining wholly within the lift basket. Ensure that the grease hose is clear and does not tangle while ascending and descending.
10. Once greasing procedures are complete lower the aerial lift basket to a clear and safe location on the ground, roll up the grease hose, clean all tools and place them in the correct locations on the test unit.

Crown Valve, #2 Main Well Valve and #1 Main Well Valve
(With well pressure present and equalized)

1. Fully open and close the valve to determine the number of turns required to completely open and/or close it.
2. Open or close the valve to the midway point. (halfway open or closed)
3. Reposition the lift basket as required to remove the grease stem/port cap on either the front or rear grease stem.
4. Remove the grease stem/port cap.
5. Attach the grease unit hose fitting to the valve grease stem.
6. Open the grease hose attachment fitting needle valve. (full open)
7. Lower the aerial lift basket to a clear and safe location on the ground.
8. Start the grease unit air compressor and let it run until pressure is sufficient in the pressure tank that the unit slows to an idle.
9. Open the ball valve that supplies air to the grease pump and allow the pressure to build up to 10,000 psi.
10. Reenter the aerial lift basket, tie-off and reposition the basket so that the valve handle/wheel can be accessed without the need of gaining additional height and remaining wholly within the basket.
11. Rotate the valve handle to the fully open and fully closed position twice.

12. Open the valve to the midway point.
13. Reposition the aerial lift basket so that the grease hose attachment fitting and needle valve can be accessed without the need for gaining additional height and remaining wholly within the basket.
14. Close the grease hose attachment fitting needle valve and remove it from the stem.
15. Secure the grease hose to the lift basket.
16. Replace the grease stem/port cap.
17. Repeat steps #4, #5, #10 and #12 thru #15 on the opposite grease stem/port on the same valve.
18. Leave the valve in the open or closed position as staging dictates and/or as directed by the company representative.

Crown Valve, #2 Main Well Valve, #1 Main Well Valve
(With no pressure present on either side of the valve)(This method requires help from a second person)

1. Fully open and close the valve to determine the number of turns required to completely open and/or close it.
2. Open or close the valve to the midway point. (halfway open or closed)
3. Reposition the lift basket as required to remove the grease stem/port cap on either the front or rear grease stem.
4. Remove the grease stem/port cap.
5. Attach the grease unit hose fitting to the valve grease stem.
6. Open the grease hose attachment fitting needle valve. (full open)
7. Lower the aerial lift basket to a clear and safe location on the ground.
8. Start the grease unit air compressor and let it run until pressure is sufficient in the pressure tank that the unit slows to an idle.
9. Reenter the aerial lift basket, tie-off and reposition the basket so that the valve handle/wheel can be accessed without the need of gaining additional height and remaining wholly within the basket.
10. Have a second person open the ball valve that supplies air to the grease pump and allow the pump to stroke 20 times while continuously opening and closing the valve.
11. Open the valve to the midway point.
12. Close the grease hose attachment fitting needle valve and remove it from the stem.
13. Secure the grease hose to the lift basket.
14. Replace the grease stem/port cap.
15. Repeat steps #4, #5, #9, #10, #11 and #12 on the opposite grease stem/port on the same valve.
16. Leave the valve in the open or closed position as staging dictates and/or as directed by the company representative.

Manuel Wing Valves
(With pressure present and equalized)

1. Fully open and close the valve to determine the number of turns required to completely open and/or close it.
2. Open or close the valve to the midway point. (halfway open or closed)
3. Reposition the lift basket as required to remove the grease stem/port cap on bottom grease stem.
4. Remove the grease stem/port cap.
5. Attach the grease unit hose fitting to the valve grease stem.
6. Open the grease hose attachment fitting needle valve. (full open)
7. Lower the aerial lift basket to a clear and safe location on the ground.
8. Start the grease unit air compressor and let it run until pressure is sufficient in the pressure tank that the unit slows to an idle.
9. Open the ball valve that supplies air to the grease pump and allow the pressure to build up to 2,500 psi.
10. Reenter the aerial lift basket, tie-off and reposition the basket so that the valve handle/wheel can be accessed without the need of gaining additional height and remaining wholly within the basket.
11. Rotate the valve handle to the fully open and fully closed position twice.
12. Close the grease hose attachment fitting needle valve and remove it from the stem.
13. Secure the grease hose to the lift basket.
14. Replace the grease stem/port cap.
15. Leave the valve in the open or closed position as staging dictates and/or as directed by the company representative.

Manuel Wing Valves
(With no pressure present on either side of the valve) (This method requires the help of a second person)

1. Fully open and close the valve to determine the number of turns required to completely open and/or close it.
2. Open or close the valve to the midway point. (halfway open or closed)
3. Reposition the lift basket as required to remove the grease stem/port cap on either the front or rear grease stem.
4. Remove the grease stem/port cap.
5. Attach the grease unit hose fitting to the valve grease stem.
6. Open the grease hose attachment fitting needle valve. (full open)
7. Lower the aerial lift basket to a clear and safe location on the ground.
8. Start the grease unit air compressor and let it run until pressure is sufficient in the pressure tank that the unit slows to an idle.
9. Reenter the aerial lift basket, tie-off and reposition the basket so that the valve handle/wheel can be accessed without the need of gaining additional height and remaining wholly within the basket.
10. Have a second person open the ball valve that supplies air to the grease pump and allow the pump to stroke 5 times while continuously opening and closing the valve.
11. Close the grease hose attachment fitting needle valve and remove it from the stem.
12. Secure the grease hose to the lift basket.
13. Replace the grease stem/port cap.
14. Leave the valve in the open or closed position as staging dictates and/or as directed by the company representative.

End of procedure

4/12/2013

Nipple down / Rig down Procedures

The Nipple down / Rig down procedures are a combined effort of the Wireline, Pressure Control / Lubrication (PCL), Crane, Emergency Well Control (EWC) Frac and XPAT crews. The nippling down / rig down process does not begin until after the final fracturing process, the well is flushed and the frac lines are removed from the goat head. The XPAT nipple down / rig down procedures are as follows:

1. Ensure that all valves (#1 master, #2 master, all four wing valves and the crown valve) are closed.
2. Assemble the Torq/lite Inline Ratcheting hydraulic torque unit (hoses and correct torque tool) and load it into aerial lift basket.
3. Load misc. tools into the aerial lift basket. (crescent wrench, 2 lb. hammer and back-up hammer wrenches, lifting eye, etc..).
4. Lay out the air hose and attach the air hose to the torque unit and air compressor (ensure the correct whip checks are used and the crows feet attachments on the air hose are pinned in place). Ensure the hose is placed in such a fashion that it is not a trip hazard and will not become entangled in any equipment, valves, etc. while being lifted into the air.
5. Attach a 4' or SRL lanyard and put on a four point harness and adjust it properly. (lanyards in excess of 4' or that have built-in shock absorbers are restricted. Do Not Use)
6. Start the air compressor and make sure all valves are in the desired position. Press the throttle button to increase engine RPM.
7. Step into the aerial lift basket and attach your lanyard to the approved anchor point within the basket. Once all personnel within the basket are anchored (tied off), start the lift engine and maneuver the basket to the desired location.
8. Direct the crane operator to position the lifting hook directly above the night/lifting cap. Attach the cap to the hook using the proper size sling. Once the crane lifting hook and lifting cap attachment is made direct the crane operator to apply upward pressure until the sling is slightly snug.
9. Reposition the aerial lift basket so that the fasteners (nuts) on the bottom flange of the BOP (blow out preventor) can be easily accessed above the top rail of the lift basket and personnel can access all fasteners (nuts) without the need to gain additional height.
10. Using the torque unit, loosen all of the (top) fasteners (nuts) that are securing the BOP to the spool. (The torque unit settings will need to be in excess of the pressure in which the fasteners (nuts) where installed. A pressure in excess of 4500 psi is usually sufficient). Do not remove the fasteners (nuts). Loosen the fasteners (nuts) so that approx. 1/4” of clear space is present between the fastener (nut) and the flange.
11. Reposition the aerial lift basket so that the fasteners (nuts) on the bottom flange of the spool can be easily accessed above the top rail of the lift basket and personnel can access all fasteners (nuts) without the need to gain additional height.
12. Using the torque unit, loosen all of the (top) fasteners (nuts) that are securing the spool to the crown valve. Remove the fasteners (nuts) from either the top or bottom of the studs and place them into the lift basket for future use.
13. Once all fasteners (nuts) have been removed direct the crane operator to lift the BOP assembly from the crown valve and lower it to the desired location as directed by the PCL crew.
14. Reposition the aerial lift basket so that the fasteners (nuts) that are securing the crown valve to the goat head can easily be accessed above the top rail of the lift basket and personnel can access all fasteners (nuts) without the need to gain additional height.
15. Using the torque unit loosen all fasteners (nuts) that are securing the crown valve to the goat head. Do not remove the fasteners (nuts). Loosen the fasteners (nuts) so that approx. 1/4” of clear space is present between the fasteners (nuts) and the bottom flange of the crown valve.
16. Reposition the aerial lift basket so that the fasteners (nuts) that are securing the main hydraulic valve to the cross can easily be accessed above the top rail of the lift basket and personnel can access all fasteners (nuts) without the need to gain additional height.
17. Using the torque unit loosen all fasteners (nuts) that are securing the main hydraulic valve to the the cross. Do not

remove the fasteners (nuts).

18. Reposition the aerial lift basket so that two (2) slings from the crane lifting hook can be positioned (one each) on the front and rear stems of the crown valve.
19. Direct the crane operator to lower the lifting hook and slings directly above the crown valve. Position one (1) sling on the front stem and one (1) sling on the rear stem of the valve and direct the crane operator to apply slight upward pressure on the slings until the are slightly snug.
20. Reposition the aerial lift basket so that the fasteners (nuts) that are securing the main hydraulic valve to the cross can easily be accessed above the top rail of the lift basket and personnel can access all fasteners (nuts) without the need to gain additional height. Remove the bottom fasteners (nuts) and place them into the lift basket.
21. Direct the crane operator to lift the crown valve/goat head/ main hydro valve assembly from the cross and lower it to the desired location as directed by the EWC crew.

    Once the EMC crew removes the fasteners from the crown valve/ goat head connection they will direct the crane operator to lift the crown valve back into position above the cross.
22. Once the crown valve is within close (within 1" to 1 1/2") proximity of the top flange on the wing valve cross manipulate the assembly so that it is facing the direction desired by the company representative. Once the correct bolt alignment is achieved direct the crane operator to slowly lower the assembly into place while keeping your hands and fingers clear of all pinch hazards.
23. With the crown valve is in place and supported by the crane reinstall the fasteners (nuts) to the bottom of the studs protruding thru the top flange of the wing valve cross. Tighten these fasteners (nuts) hand tight and remove the slings. Once all fasteners are hand tight torque all fasteners (top nuts) as required using the specifications as shown on the Torq/lite API Flange Slide Ruler. Set the required pressure on the Torq/lite Inline Ratcheting Hydraulic Torque Unit and starting on the side with the largest gap between the flanges, torque one (1) fastener (top nut) to the required pressure. Move 180 degrees and tighten another one (1) fastener to the required pressure. Moving clockwise around the flange starting with the second fastener tightened torque each subsequent fastener as required. Once all fasteners have been torqued all the way around to the initial starting point, skip two fasteners and check the pressure on four consecutive fasteners moving counter clockwise ensuring each meet torque requirements. Use the hammer wrench as back up on the bottom fastener (nut) if needed. Should the hammer wrench become lodged use the 2 lb. hammer to break it loose. Ensure that the wrench and hammer are secure and will not be dropped and/or fall once the wrench is broken free.
24. Reposition the aerial lift basket so that the night cap can be reinstalled on top of the crown valve and all fasteners (nuts) that will secure the cap to the crown valve can easily be accessed above the top rail of the lift basket and personnel can access all fasteners (nuts) without the need to gain additional height.
25. Clean the gasket seat on the wing valve cross and install a new gasket that is supplied by the EWC crew.
26. Direct the crane operator to lift the night cap and position it directly above the top flange of the crown valve.
27. Once the night cap is within close (within 1" to 1 1/2") proximity of the top flange of the crown valve manipulate the cap so that the fastener bolts align with the holes in the crown valve top flange. Once the correct bolt alignment is achieved direct the crane operator to slowly lower the assembly into place while keeping your hands and fingers clear of all pinch hazards.
28. Once the night cap is in place reinstall the fasteners (nuts) to the bottom of the studs and tighten them hand tight.
29. Release the crane lifting sling and lifting eye from the cap.
30. Using the torque unit torque all fasteners (top nuts) as required using the specifications as shown on the Torq/lite API Flange Slide Ruler. Set the required pressure on the Torq/lite Inline Ratcheting Hydraulic Torque Unit and starting on the side with the largest gap between the flanges, torque one (1) fastener (top nut) to the required pressure. Move 180 degrees and tighten another one (1) fastener to the required pressure. Moving clockwise around the flange starting with the second fastener tightened torque each subsequent fastener as required. Once all fasteners have been torqued all the way around to the initial starting point, skip two fasteners and check the pressure on four consecutive fasteners moving counter clockwise ensuring each meet torque requirements. Use the hammer wrench as back up on the bottom fastener (nut) if needed. Should the hammer wrench become lodged use the 2 lb. hammer to break it loose. Ensure that the wrench and hammer are secure and will not be dropped and/or fall once the wrench is broken free.
31. Reinstall the needle valve and gauge on the night cap. Ensure that the gauge can be read from a position facing the valves.
32. Test the assembly as directed by the company representative.

End of procedure

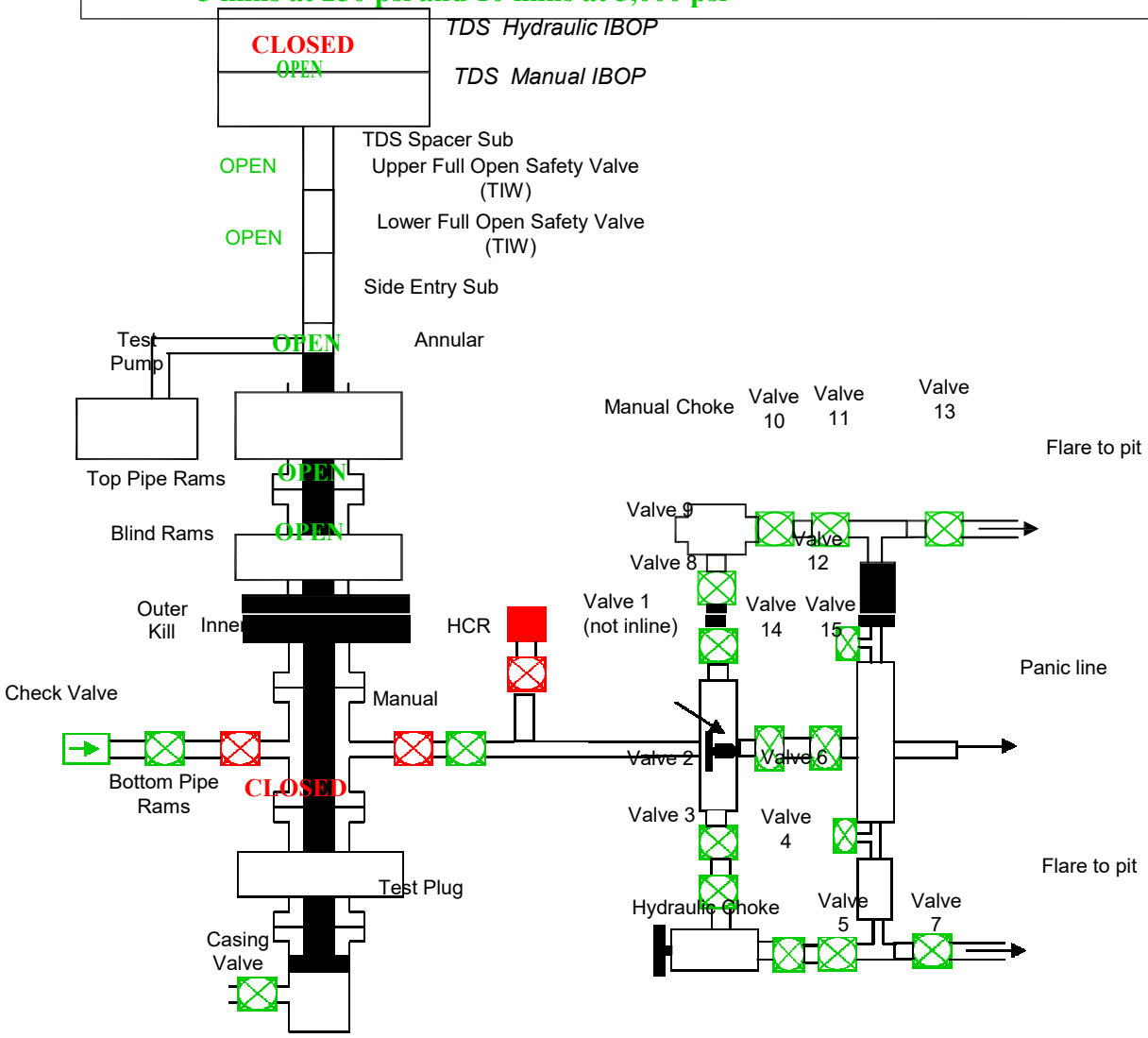
BOP Testing Procedure

updated 3/27/13

1. Verify that all well control equipment is made up and aligned properly with driller/rig manager, to include the target T in between the coflex and hard line. Check valve is to be removed before starting test
2. Ensure a competent person is in the dog house during all pressure tests, monitoring test sequence and for anything out of the normal.
3. Make up dart valve fosv and bottom pump-in sub, torque with ST-80 and Set to ods behind pipe. PU drill pipe, set in slips. Make up FOSV and test sub
4. M/U spacer sub on top drive if need be and side pump-in sub below
5. Check test plug to ensure it is free of derbies. M/U test plug. NOTE. While test joint is in the hole always have it screwed in to the test plug to prevent it from being hydraulically pumped out of the hole
6. RIH, land plug with 5K set down on plug
7. Install test port to test sub
8. **OPEN CASING VALVE on one side, ensure** check valve is removed
9. Fill stack
10. WSL to verify and test pump truck PRV to 5200-psi and murphy kick out to 5000-psi
11. Close lower pipe rams for first test
12. With all string valves open, open 2" valve on standpipe and pump one half barrel fluid to cover valves
13. Close hydraulic IBOP (casing head valve should be open)
14. Perform test 1-3 as indicated by diagrams
15. Perform test 4- Check valve must be reinstalled in the proper Direction prior to test
16. Perform test 5- koomey integrity test
17. WSL to verify and test pump truck PRV to 3600-psi for test 6
18. Perform test 6-/ hook 2" high psi hose to standpipe and test with this step /check dp gauges on the Super Choke panel and in the choke house to verify the gauges are working correctly.Tester to only bleed down to 500 psi after test. Rig will bleed back the rest of pressure through 2" on pump to avoid back feeding water into test hose. (Winter operation: Blow down back to pump)
19. WSL to verify and test pump truck to 5200-psi and murphy kick out to 5000-psi before continuing to test #7
20. Back string out of plug, and perform **Test #7**
21. run in with drill pipe joint to retrieve test plug. Lay down drill pipe joint and plug**.** Close casing head valve
22. Perform casing test to 250 psi low and 1500 high, WSL to verify and test pump truck to 1700-psi and murphy kick out to 1600-psi. Check Casing PSI gauge on the Super Choke Panel and Choke House to verify the gauges are working correctly.
23. ISOLATE MANUAL CHOKE VALVE AND HCR TO PRESSURE AGAINST FOR MANIFOLD TESTING
24. Perform Test # 8-10 off line and choke tests. WSL to verify and test pump truck to 5200-psi and murphy kick out to 5000-psi
25. DURING TESTING RIG CREWS to Break out TIW and test sub. Install wear bushing.
26. MU production BHA
27. RDMO BOPE testers

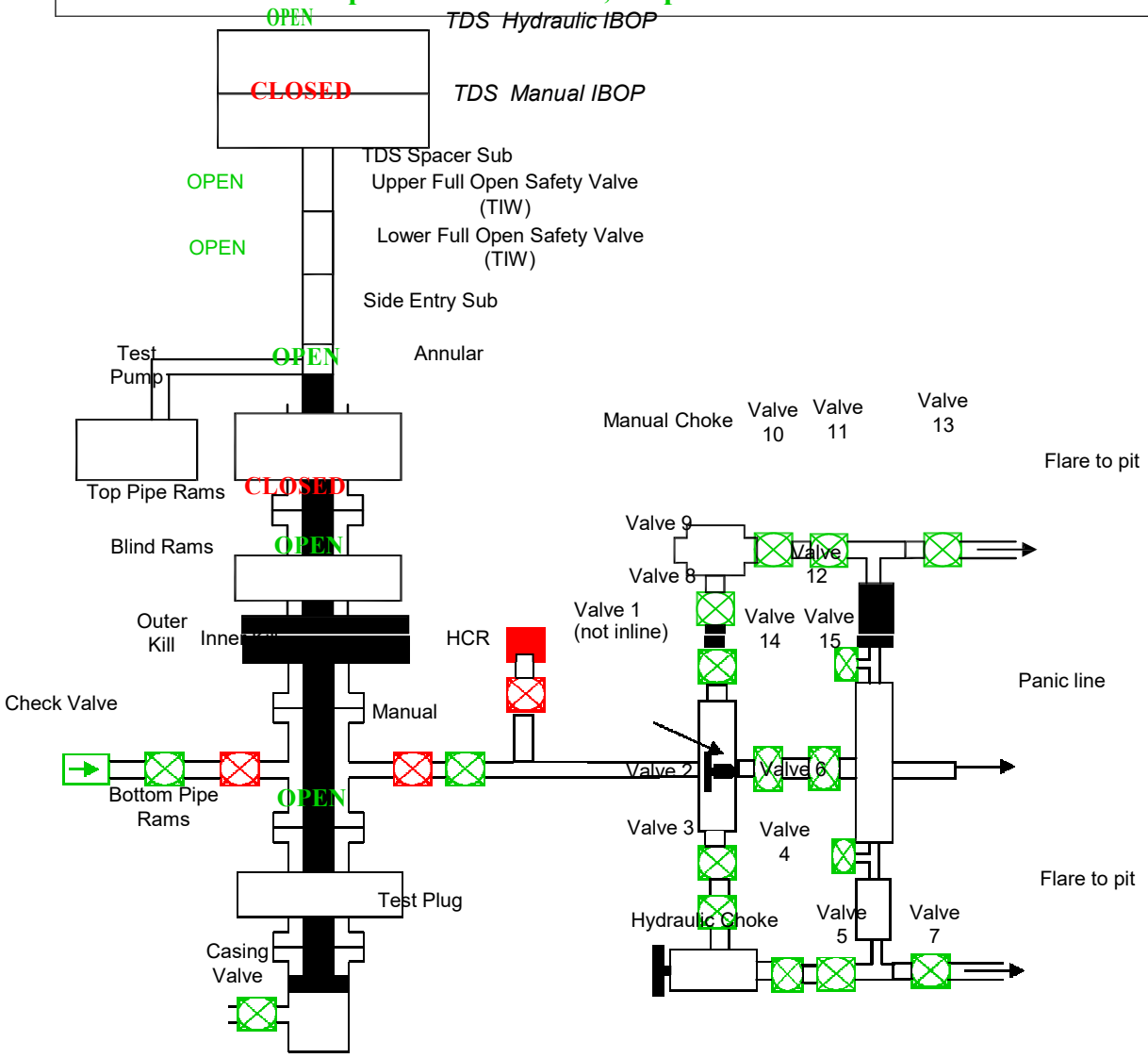
Test 1 – Set and test pop off and murphy switch prior to starting test. Lower Pipe Rams, Hydraulic TDS IBOP (Inner kill and inside manual closed to keep stack full of water)

5 mins at 250 psi and 10 mins at 5,000 psi



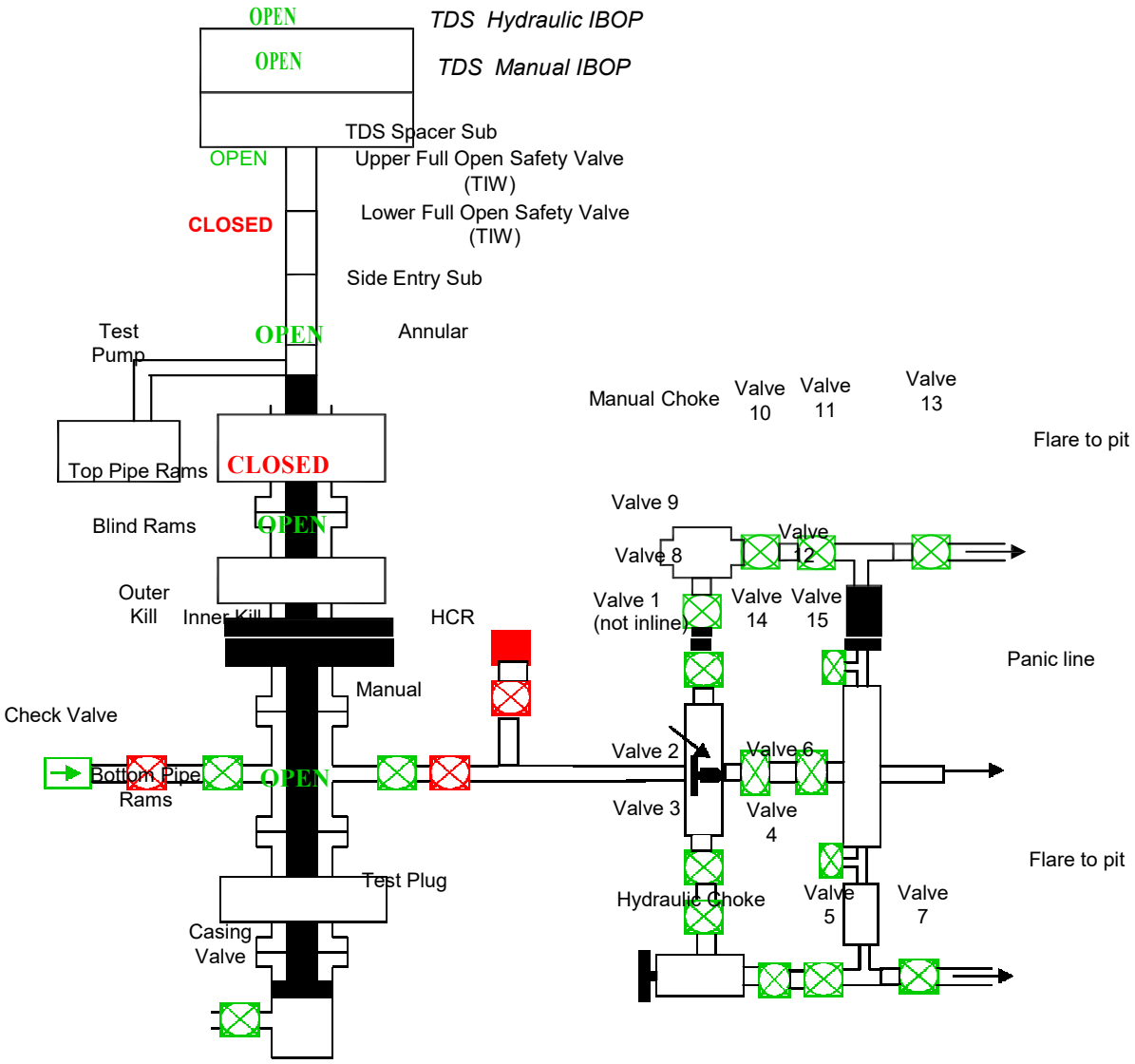
Test 2 – Top Pipe Rams, Manual TDS IBOP, Inner Kill Line Valve, inside choke line valve, dart valve

5 mins at 250 psi and 10 mins at 5,000 psi



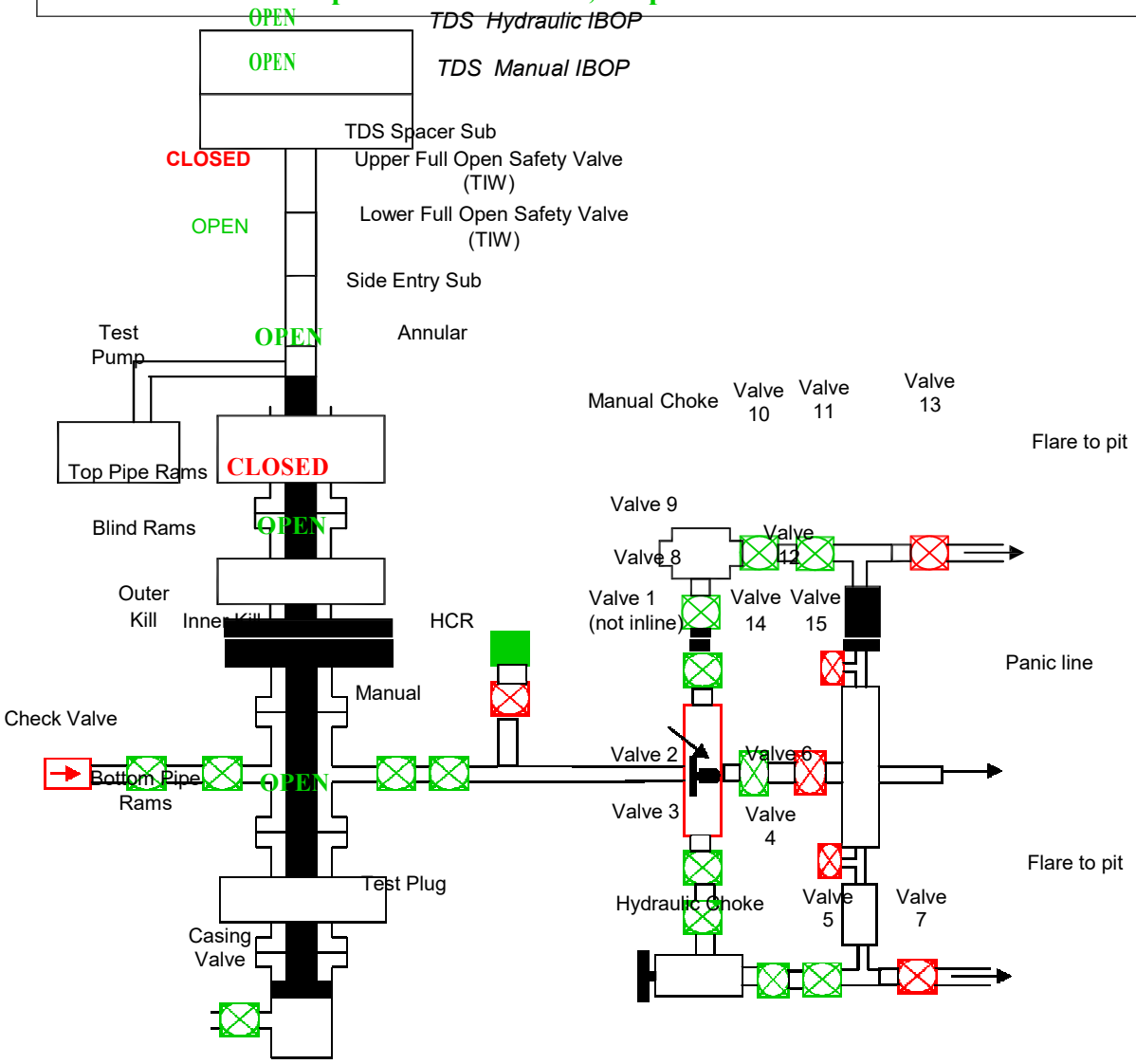
Test 3 – Top Pipe Rams, TIW, outer Kill Line Valve, HCR, spare TIW

5 mins at 250 psi and 10 mins at 5,000 psi



Test 4 – Top Pipe Rams, Kill Line Check Valve, Choke Manifold Valves #6,7,12,13,15, Riser Valve (#1), Lower Blow Down Valve and Top FOSV

5 mins at 250 psi and 10 mins at 5,000 psi



Test 5 –

PERFORM KOOMEY INTEGRITY TEST

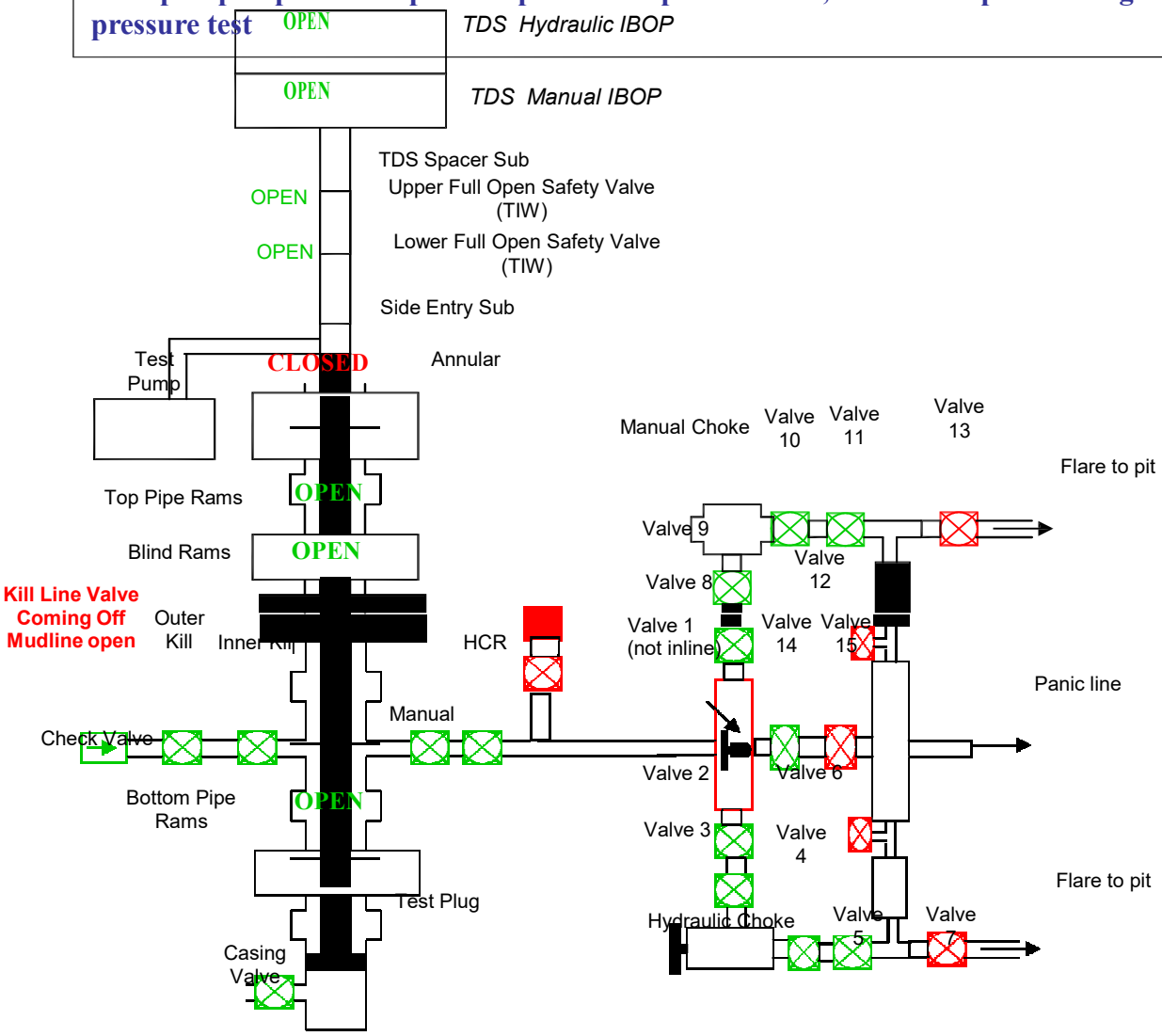
H&P 310

Test 6 – Annular, Mud Lines back to Mud Pumps, Kill Line

WSL to verify the tester adjusted his PRV back to 3600-psi for lower test

5 mins at 250 psi and 10 mins at 3,500 psi

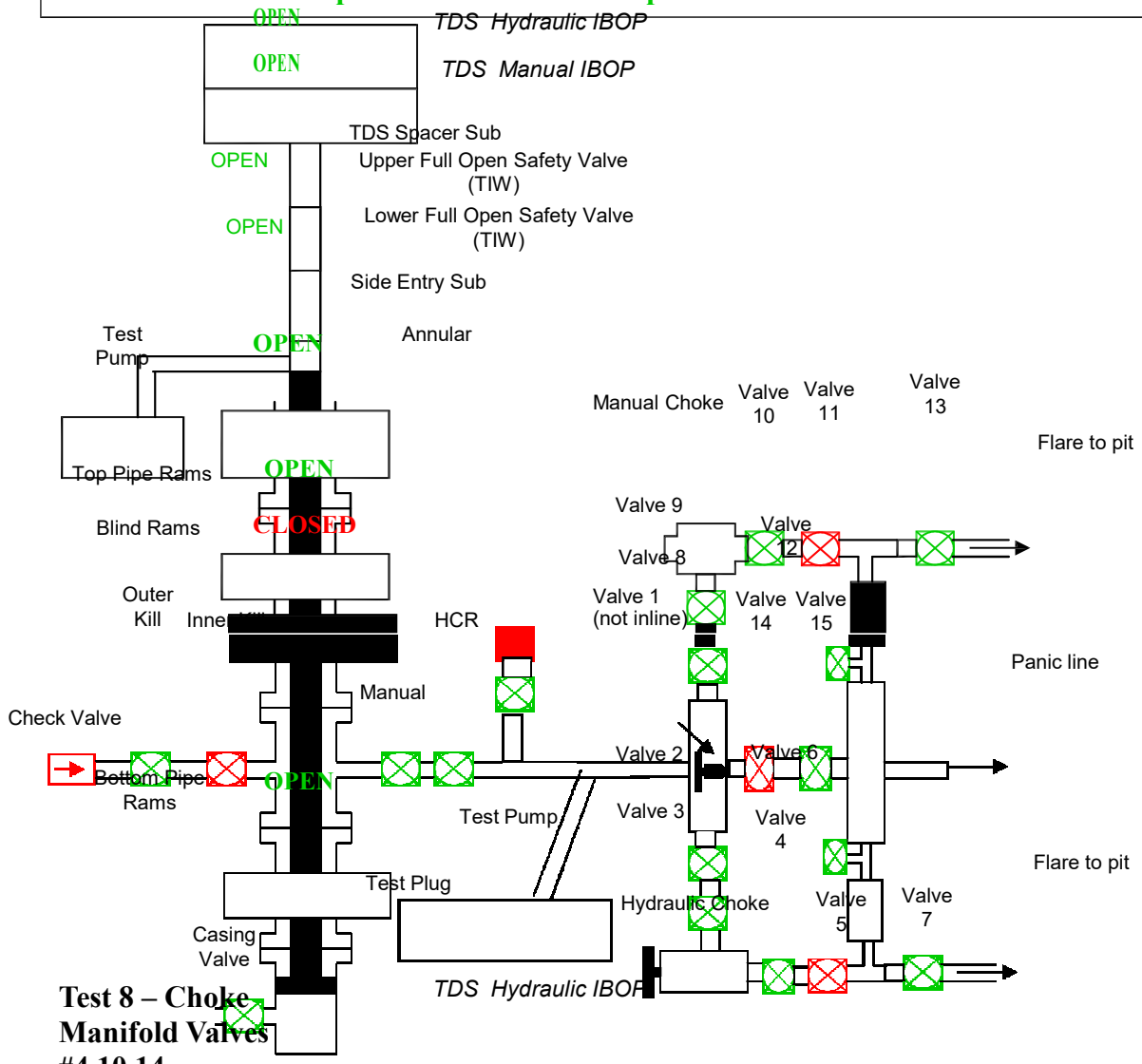
Mud pump to pressure up to 250 psi for low pressure test, then tester perfoms high pressure test



Test 7 – Blind Rams, Choke Manifold Valves #5,11,14, Upper Blow Down Valve

WSL to verify and test pump truck PRV to 5000 and murphy to 5200-psi for test 7

5 mins at 250 psi and 10 mins at 5000 psi



Test 8 – Choke Manifold Valves #4,10,14, Hydraulic and Manual Choke Body Test

5 mins at 250 psi and 10 mins at 5000 psi

OPEN

OPEN

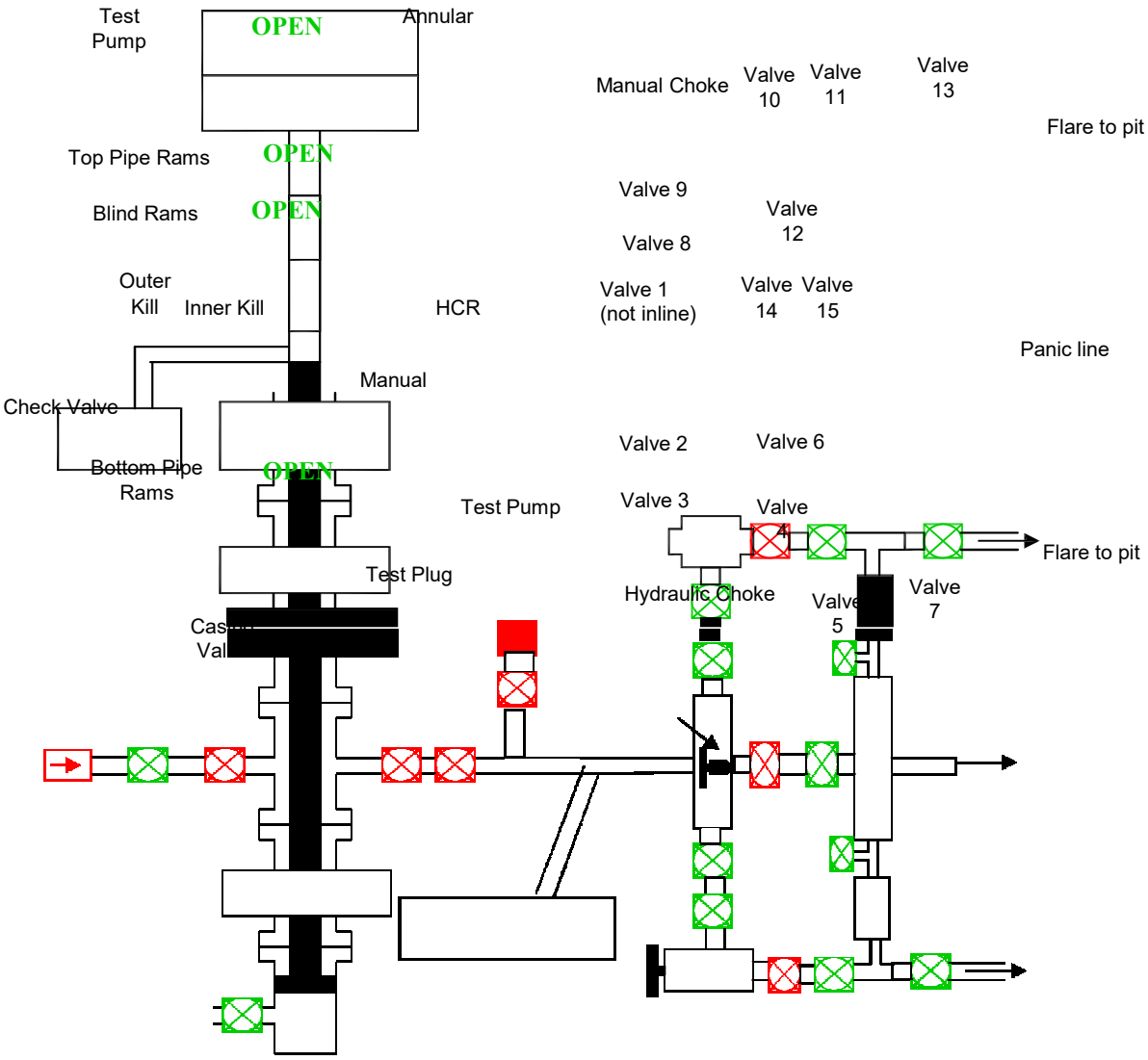
TDS Manual IBOP

TDS Spacer Sub

OPEN Upper Full Open Safety Valve (TIW)

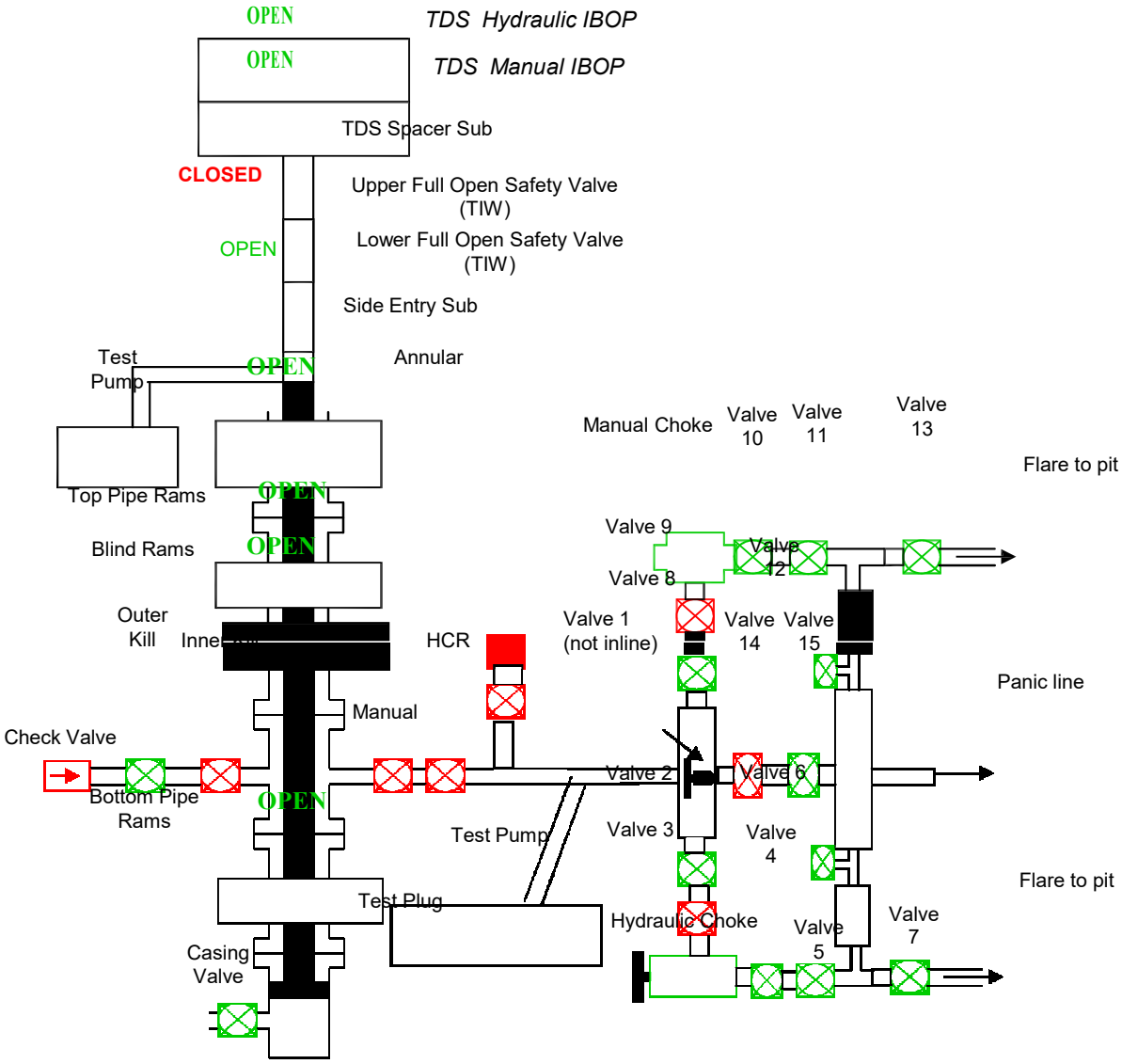
OPEN Lower Full Open Safety Valve (TIW)

Side Entry Sub



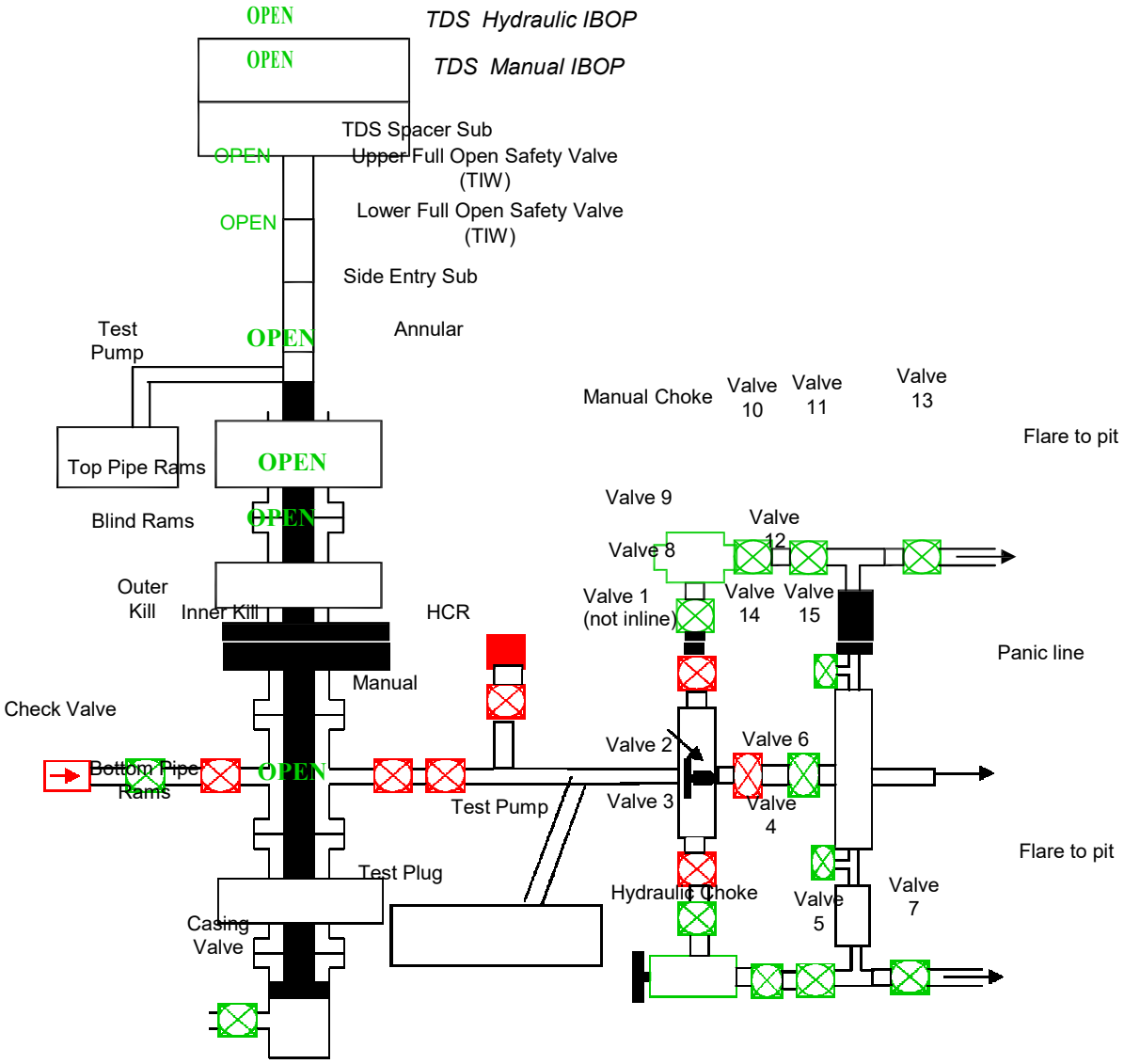
Test 9– Choke Manifold Valves #3,9,14

5 mins at 250 psi and 10 mins at 5000 psi



Test 10– Choke Manifold Valves #2,8,14

5 mins at 250 psi and 10 mins at 5000 psi



Test 11– Surface Casing

Complete Well Control Checklist Prior to Picking up BHA