

APD – Positive Test, Negative Test and Displacement Procedures

POSITIVE PRESSURE TESTING PROCEDURE

Notes:

- Positive Pressure Tests should be conducted utilizing the cement unit to ensure accurate volume control.
 - Positive Pressure Test results should be recorded on a chart and retained for future reference.
 - Prior to performing a positive pressure test, confirm the density of the fluid in the wellbore.
 - Prior to performing a positive pressure test, confirm the APD approved test pressures and associated fluid density. Adjust the test pressure, as needed, using the actual fluid density in the wellbore. This does not require a MOC.
 - A successful positive pressure test for casing and/or liner is defined as a pressure decline of less than 10% during a 30 minute pressure test and no other indications of a leak.
1. Close the Blind Shear Ram or VBR/Pipe Ram/Annular if pipe is positioned across the BOP.
 2. Line up the trip tank to continuously monitor the annulus fluid level.
 3. Pump down the Choke or Kill line and drill pipe (if pipe is positioned across the BOP) to pressure up to the required test pressure. Record and plot the volume of fluid pumped versus the pressure while pressuring up the system.
 4. When the required test pressure is reached, shut down the pump and monitor the pressure for a pre-determined time. Notify the Driller of any change in the annulus fluid level in the trip tank.
 5. After pressure monitoring is completed, bleed off the pressure to zero psi. Record and plot the volume of fluid returned to the trip tank from the bleed off. Compare against the volume required to pressure up the system to the test pressure.
 6. Upon validation of the positive pressure test, the Drilling Foremen should document the positive pressure test results on the IADC and APC Daily Drilling reports.

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NEGATIVE PRESSURE TESTING PROCEDURE

Notes:

- Negative Pressure Tests should be conducted utilizing the cement unit to ensure accurate volume control.
- Negative Pressure Test results should be recorded on a chart and retained for future reference.
- Prior to performing a negative pressure test, confirm the density of the fluid in the wellbore.
- The differential pressure used for the negative pressure test should consider the planned depth for the surface cement plug; typically placed 150-500' BML. The negative test should be performed prior to displacing to seawater and pumping the surface cement plug. Reference the *Negative Pressure Testing* practice in the Attachment.
- Prior to performing a negative pressure test, calculate the desired displacement to achieve the differential pressure.
- Rig up from the cement unit directly into a side entry sub with full opening safety valves positioned above and below the side entry sub. This will minimize the surface volume and potential surface leak paths during the negative pressure test.
- Monitor the wellhead pressure during the negative pressure test from the BOP gauge reading at the BOP Control Panel on the Drill Floor.
- Planned pressure bleed off should discontinue if anomalous pressure trends occur. Anomalous pressure trends include significant rising pressure or non-linear pressure versus volume trends. The well should remain shut in until the well conditions are diagnosed and a plan for resolution is developed.
- A successful negative pressure test is defined as no flow for a 30 minute period.
- There are three methods that can be utilized to perform a Negative Pressure Test. The method used is contingent on what is being tested.
 - Method #1: Utilizing Drill Pipe with a Wellbore Packer Device (with bypass capability).
 - Method #2: Utilizing Drill Pipe (No Float) and the BOP to Seal the Wellbore.
 - Method #3: Utilizing the Kill Line and the BOP to Seal the Wellbore (No DP in the Well).

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NEGATIVE PRESSURE TESTING PROCEDURE

METHOD #1: UTILIZING DRILL PIPE WITH A WELLBORE PACKER DEVICE (WITH BYPASS CAPABILITY)

1. The packer setting depth should be confirmed to ensure the correct differential pressure can be achieved. The minimum packer setting depth should be 100-200' BML.
2. The density of the fluid in the wellbore being displaced and the lower density fluid to be utilized to achieve the differential should be confirmed to ensure the correct differential pressure can be achieved.
3. The drill string tool joints should be spaced out to ensure the BOP's can be activated in the event of an emergency, (i.e. no tool joints spaced across BOP ram and/or Annular).
4. Rig up from the cement unit directly into a side entry sub with full opening safety valves positioned above and below the side entry sub. This will minimize the surface volume and potential surface leak paths during the negative pressure test.
5. Calculate the volumetric displacement required to achieve the desired differential pressure.
6. Set the packer at the planned depth. Perform a positive pressure test down the backside. Record the pressure test on a chart and retain for future reference.
7. Open the bypass on the packer. Displace the fluid in the wellbore by pumping lower density fluid down the drill string. Upon reaching the pre-determined volume stop pumping. At this point, the trapped pressure on the drill pipe should equal the required differential pressure.
8. Upon verification of the correct differential pressure, close the bypass on the packer. By closing the bypass, communication between the drill pipe and the wellbore below the packer is now established.
9. Line up the trip tank to continuously monitor the annulus fluid level. Notify the Driller of any deviation in the annulus fluid level.
10. Slowly bleed off the pressure on the drill pipe in increments to zero psi, monitoring 5 minutes between cycles. Record the bleed volume and pressure for each cycle. After bleeding the pressure to zero psi monitor the well at the cement unit for 30 minutes. A successful negative pressure test is defined as no flow for a 30 minute period. Flow back may be an indication that the test has failed and the well should be shut in.
11. Upon successful completion of the negative pressure test, apply the equivalent differential pressure on the drill string. Open the bypass on the packer. Reverse out the lower density fluid from the drill string with the drilling fluid.
12. Unseat the packer. Check the well for flow.
13. Upon validation of the negative pressure test, the Drilling Foremen should document the negative pressure test results on the IADC and APC Daily Drilling reports.
14. If no flow, POOH with the packer and resume normal operations.

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NEGATIVE PRESSURE TESTING PROCEDURE

METHOD #2: UTILIZING DRILL PIPE (NO FLOAT) AND THE BOP TO SEAL THE WELLBORE

Note: Do not exceed the OEM negative pressure ratings of the ring gaskets within the BOP stack and/or in the BOP-WH Connector pending the BOP ram/Annular utilized during the negative pressure test. Reference the *Connector and Ring Gaskets* practice in the Attachment.

1. The drill string depth shall be confirmed to ensure the correct differential pressure can be achieved.
2. The density of the fluid in the wellbore being displaced and the lower density fluid to be utilized to achieve the differential should be confirmed to ensure the correct differential pressure can be achieved.
3. The drill string tool joints should be spaced out to ensure the BOP Rams being used in the test are clear of all tool joints (i.e. no tool joints spaced across BOP ram and/or Annular).
4. Rig up from the cement unit directly into a side entry sub with full opening safety valves positioned above and below the side entry sub. This will minimize the surface volume and potential surface leak paths during the negative pressure test.
5. Calculate the volumetric displacement required to achieve the desired differential pressure.
6. Consideration should be given to the differential pressure across the BOP stack when using this method. The ram packer seals could fail as a result of a negative pressure below the ram. In cases where the negative pressure below the ram exceeds OEM negative pressure ratings, the Test ram should be utilized for the negative pressure test. Reference the *BOPE Pressure Limitations* practice in the Attachment.
7. Displace the fluid in the wellbore by pumping lower density fluid down the drill string. Upon reaching the pre-determined volume stop pumping. At this point, the trapped pressure on the drill pipe should equal the required differential pressure.
8. Upon verification of the correct differential pressure, close the predetermined ram.
9. Line up the trip tank to continuously monitor the annulus fluid level. Notify the Driller of any deviation in the annulus fluid level.
10. Slowly bleed off the pressure on the drill pipe in increments to zero psi, monitoring 5 minutes between cycles. Record the bleed volume and pressure for each cycle. After bleeding the pressure to zero psi monitor the well at the cement unit for 30 minutes. A successful negative pressure test is defined as no flow for a 30 minute period. Flow back may be an indication that the test has failed and the well should be shut in.
11. Upon successful completion of the negative pressure test, apply the equivalent differential pressure on the drill string. Open the Test ram if utilized. Close a BOP ram/Annular.
12. Reverse out the lower density fluid from the drill string with the drilling fluid. Open the BOP ram/Annular.

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13. Upon validation of the negative pressure test, the Drilling Foremen should document the negative pressure test results on the IADC and APC Daily Drilling reports.
14. Check the well for flow. If no flow, resume normal operations.

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NEGATIVE PRESSURE TESTING PROCEDURE

METHOD #3: UTILIZING THE KILL OR CHOKE LINE AND THE BOP TO SEAL THE WELLBORE

Note: Do not exceed the OEM negative pressure ratings of the ring gaskets within the BOP stack and/or in the BOP-WH Connector pending the BOP ram/Annular utilized during the negative pressure test. Reference the *Connector and Ring Gaskets* practice in the Attachment.

1. The density of the fluid in the wellbore being displaced and the lower density fluid to be utilized to achieve the differential pressure should be confirmed to ensure the correct differential pressure can be achieved.
2. Calculate the volumetric displacement required to achieve the desired differential pressure.
3. Displace the fluid in the wellbore by pumping lower density fluid down the Choke or Kill line. Upon reaching the pre-determined volume stop pumping. At this point, the trapped pressure on the Choke or Kill line should equal the required differential pressure.
4. Upon verification of the correct differential pressure, close the Blind-Shear ram. Do not utilize this method if the differential pressure exceeds OEM negative pressure ratings of the BSR. Reference the *BOPE Pressure Limitations* practice in the Attachment.
5. Line up the trip tank to continuously monitor the Riser fluid level. Notify the Driller of any deviation in the Riser fluid level.
6. Slowly bleed off the pressure on the Choke or Kill line in increments to zero psi, monitoring 5 minutes between cycles. Record the bleed volume and pressure for each cycle. After bleeding the pressure to zero psi monitor the well at the cement unit for 30 minutes. A successful negative pressure test is defined as no flow for a 30 minute period. Flow back may be an indication that the test has failed and the well should be shut in.
7. Upon successful completion of the negative pressure test, reverse out the lower density from the Choke or Kill line (whichever is utilized for the test) by pumping drilling fluid down the opposing Choke or Kill line.
8. Open the Blind-Shear ram.
9. Upon validation of the negative pressure test, the Drilling Foremen should document the negative pressure test results on the IADC and APC Daily Drilling reports.
10. Check the well for flow. If no flow, resume normal operations.

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RISER DISPLACEMENT PROCEDURE

If a riser displacement is conducted within the context of this permit, a riser displacement procedure will be provided for the District Manager's approval with the temporary abandonment procedure at that time in the well when actual mud weights and well conditions are confirmed.