Well Control Procedures

Flow Check while Drilling

1. Alert crew.
2. Stop rotary.
3. Pick up kelly or clear uppermost tool joint above the rig floor.
4. Shut off pump.
5. Observe well for flow.

Flow Check while Tripping

1. Alert crew.
2. Set slips so last tool joint is at normal working level above rig floor.
3. Install fill opening safety valve in open position.
4. Observe well for flow.

Note: Make flow check prior to pulling BHA.

Soft Shut-in when Drilling

1. Open the choke line valve near the BOP stack.
2. Close designated BOP.
3. Close the pre-selected choke.
4. Notify company personnel.
5. Read and record SIDPP & SICP each minute until pressures stabilize.

Soft Shut-in when Tripping

1. Close full opening safety valve or hydraulic valve on topdrive.
2. Open the choke line valve near the BOP stack.
3. Close designated BOP.
4. Close choke while watching casing pressure to ensure pressure limitations are not exceeded or pressure trapped.
5. Notify company personnel.
6. Pick up kelly and open FOSV or open valve on topdrive.
7. Read and record SIDPP, SICP each minute until pressures stabilize.

Hard Shut-in when Drilling

1. Close designated BOP.
2. Open the choke line valve (HCR) near the BOP stack.
3. Read and record the pit gain and the SIDPP, and SICP each minute until the pressures stabilize.
4. Notify company personnel.

Hard Shut-in when Tripping

1. Close full opening safety valve (FOSV).
2. Close designated BOP.
3. Open the choke line valve (HCR) near the BOP stack.
4. Make up kelly or top drive and open (FOSV).
5. Read and record the pit gain and the SIDPP and SICP each minute until the pressures stabilize.
6. Notify company personnel.

Wait & Weight Method Kill Review

1. Shut in well and record SIDPP & SICP every 60 seconds until stabilized.
2. Calculate kill fluid density & weight up pits.
3. Fill in and complete worksheet & pressure chart.
4. Bring pump to kill rate speed slowly while holding a constant casing pressure at shut in value.
5. Maintain circulating pressure according to chart. This is accomplished by adjusting the backpressure (casing) with the use of the choke. Do not adjust pump speed to maintain pressure.
6. When kill mud reaches bit, maintain FCP, final circulating pressure for the remainder of the kill operation.
7. When influx is circulated from well and kill mud is consistent throughout the system, the well may be shut in to determine if dead. If not, continue circulating.

Driller's Method Kill Review

1. Shut in well and record SIDPP & SICP every 60 seconds.
2. Bring pump to kill rate speed while holding a constant casing pressure at the stabilized shut in value.
3. Maintain circulating pressure (SIDPP+KRP) until influx has been removed from the well.
4. Induced/swabbed kick: Shut the well back in and determine if dead.
5. Under-balance kick: Calculate the kill weight density required to control the well.
6. Prepare pressure chart and circulate the new heavier fluid through the well.
7. Maintain circulating pressure according to chart. This is accomplished by adjusting the back pressure (casing) with the use of the choke. Do not adjust pump speed to maintain pressure.
8. When kill mud is consistent throughout the system, the well may be shut in to determine if dead. If not, continue circulating.

Reverse Circulating Kill Review

1. Assure proper standpipe and manifold line-up.
2. Bring pump to kill rate speed while holding a constant (SITP) backpressure on the tubing.
3. When pump is at desired speed, circulating pressure on the casing is held constant until the tubing is displaced if both the packer fluid and kill fluid are of the same and sufficient density to kill the well.
4. If the annulus fluid (or packer fluid) is not of sufficient density then it is necessary to pump kill weight fluid:
   a. Hold constant circulating pressure (casing pressure) until the tubing is displaced.
   b. Switch to the Tubing pressure and hold tubing pressure constant until the annulus has been displaced.
   c. Switch to the Casing pressure and hold casing pressure constant until kill weight fluid has been circulated throughout the well system.
5. The well may be shut in at this time and checked for pressure build-up. If no pressure build-up the well may be opened up and checked for flow. If no flow then the operations may continue.
6. If pressure build-up or flow occurs the well may be circulated a second time.

Bullhead Kill Review

1. With the well shut in, determine tubing pressure. If bullheading down the casing, determine casing pressure.
2. Prepare bullhead worksheet and pressure chart.
3. When going down the tubing, some pressure may be applied to the casing to prevent burst.
4. If bullheading the casing, pressure may be applied to the tubing to prevent collapse.
5. Bring pump online with enough pressure to overcome surface pressure.
6. Do not exceed maximum allowables during bullhead process.
7. Record any pump rate changes as well as pressure changes at the predetermined stroke/volume check points.

8. When the required volume has been pumped, or when a pressure increase indicates bullhead fluid entering the formation, turn off the pump.
9. Slowly bleed surface pressures to zero.
10. Shut in the well and monitor for pressure.

Diverting while Drilling

1. Do not shut pump down! (This will result in a lowering of bottomhole pressure allowing the well to unload at a higher rate.)
2. Chain down the brake.
3. Open downwind diverter line.
4. Close the diverter packer.
   Note: Many rigs have the diverter lines and diverter packer tied together to minimize confusion at a critical time.
5. Pump at maximum rate with drilling mud, seawater or heavy mud.
6. Set a watch observing diverter system for signs of failure.
7. Set a watch for signs of broaching.