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ACTIONS UPON TAKING A KICK SHUT-IN PROCEDURES			

1 SHUT-IN PROCEDURES

See Figure 5.3.1, for outline Shut-In Procedures.

2 DRILLING - SURFACE BOP'S

The procedure is:

- Stop rotation.
- Pick up the drillstring to shut-in position.
- Stop the pumps and flow check - if the well flows:
 - Close annular and open remote control choke line valve (HCR).
 - Notify the Toolpusher and OIM (who must notify the Operator Representative).
 - Record and monitor shut-in drillpipe and casing pressures, pit gain and time.
 - Check space-out and close upper pipe rams and ram locks.
 - Bleed off pressure between pipe rams and annular (if possible without risking further kick).

3 DRILLING - SUBSEA BOP'S


The procedure is:

- Stop rotation.
- Pick up the string to shut-in position.
- Stop the pumps and flow check - if well flows:
 - Close the annular preventer (upper preferred), and open the choke line valves on the BOP stack.
 - Notify the Toolpusher and OIM (who must notify the Operator Representative).
 - Record and monitor the shut-in drillpipe and casing pressures (note fluid density in choke/kill lines). Record the gain in pit volume and time of day.
 - Confirm the space-out and close the designated hang-off rams with reduced closing pressure. Reduce the annular pressure (see manufacturer's guidelines), slack off and land drillstring on the rams using the drillstring compensator (DSC).
 - Increase the manifold pressure back to 1500 psi. Engage ram locks.

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- Bleed off pressure between pipe rams and annular (if possible) and open annular.
- Adjust the DSC to support the drillstring weight to the BOP plus 20,000 lbs. Position the DSC at mid-stroke.
- Monitor riser for flow (refer to Section 8 Subsection 4 Item 9).

4 TRIPPING - SURFACE BOP'S

The procedure is:

- Set the slips below the top tool joint of the stand.
- Install and close the full opening safety valve.
- Close annular and open HCR valve on choke line.
- Notify the Toolpusher and OIM (who must notify the Operator Representative).
- Make up the topdrive/kelly (insert pup joint or single between safety valve and topdrive) and open the safety valve.
- Record and monitor shut-in drillpipe and casing pressures, gain in trip tank volume and time.
- Torque up all joints and prepare to strip back to bottom.

5 TRIPPING - SUBSEA BOP'S

The procedure is:


- Set the slips below the top tool joint of the stand.
- Install and close the full opening safety valve.
- Close the annular preventer (upper preferred) and open the choke line 'fail-safe' valves on the BOP stack.
- Notify the Toolpusher and OIM (who must notify the Operator Representative).
- Make up the topdrive/kelly (insert a pup joint or single between the topdrive and the safety valve) and open the safety valve.
- Open the drillstring compensator (DSC).
- Record and monitor the shut-in drillpipe and casing pressures, gain in trip tank volume and time.
- Monitor riser for flow (refer to Section 8 Subsection 4 Item 9).
- Torque up all joints and prepare to strip back to bottom.

If unable, try to make-up top drive to string. If unsuccessful shear pipe or drop string.

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The preferred action is to return the pipe as close as possible to bottom. If the OIM decides to strip back in the hole refer to Section 6 Subsection 5.

6 WHILE OUT OF HOLE

The procedure (Surface and Subsea BOP's) is:

- Close blind/shear rams and open remote operated valve.
- Notify the Toolpusher and OIM (who must notify the Operator Representative).
- Allow pressure to stabilize and record casing pressure and pit gain, while running drillstring down to the top of the BOP's.
- Monitor riser for flow (refer to Section 8 Subsection 4 Item 9).
- Stripping procedures must be planned according to the well pressure.

7 CASING RUNNING

The following must be prepared prior to running casing:

- Careful consideration must be given to the use of casing rams, which will be dependent on the inherent risks of the section to be cased. The decision tree for casing rams (Figure 5.3.1) should be used to assist in the decision as to whether casing rams will need to be installed
- Record the annular volume between the casing and open hole/ outer casing and calculate acceptable running speeds by depth with respect to surge pressures.
- Prepare a volume displacement schedule for monitoring volumes.
- Have a circulating head on the drill floor. Check correct thread type by physical installation and have it prepared without protectors for rapid installation.
- On floating rigs, ensure a XO from casing to drillpipe is available.
- At least one and preferably two non-return valves shall be installed in the casing string when running into a hydrocarbon bearing zone. This would normally be a valve in the float collar and one in the shoe


The following should be considered for shutting-in on casing:

- The immediate priority is to shut-in the well. (NOTE: Reduce annular/ram operating pressure to account for size and type of casing across the BOP).
- The most suitable control technique can only be determined after assessing the particular conditions at the rig site.
- The subsequent options available can be summarized as follows:

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- XO to drillpipe (unless the current casing string weight is too great) and strip to bottom to kill the well.
- XO to drillpipe, strip in until the drillpipe is in the stack. Perform a top kill.
- Kill the well with the casing across the stack, (possibly using the Volumetric Method first). The possibility of disconnect must be considered.
- Bullheading.
- Drop the casing.
- Shear the casing.

The major factors that will determine the most appropriate course of action will include the following:

- The length and type of casing run.
- The possibility and consequences of the casing becoming stuck.
- The feasibility of circulating out a kick by conventional means (the smaller annular clearance may cause excessive pressures in the annulus, or might completely restrict circulation).
- The feasibility of killing the well by other means such as bullheading or by volumetric control.
- The BOP stack design and ram types.
- The casing being forced out of the hole by the well pressure.
- The weather.
- The possibilities of a disconnect due to blackout, drive-off, etc.

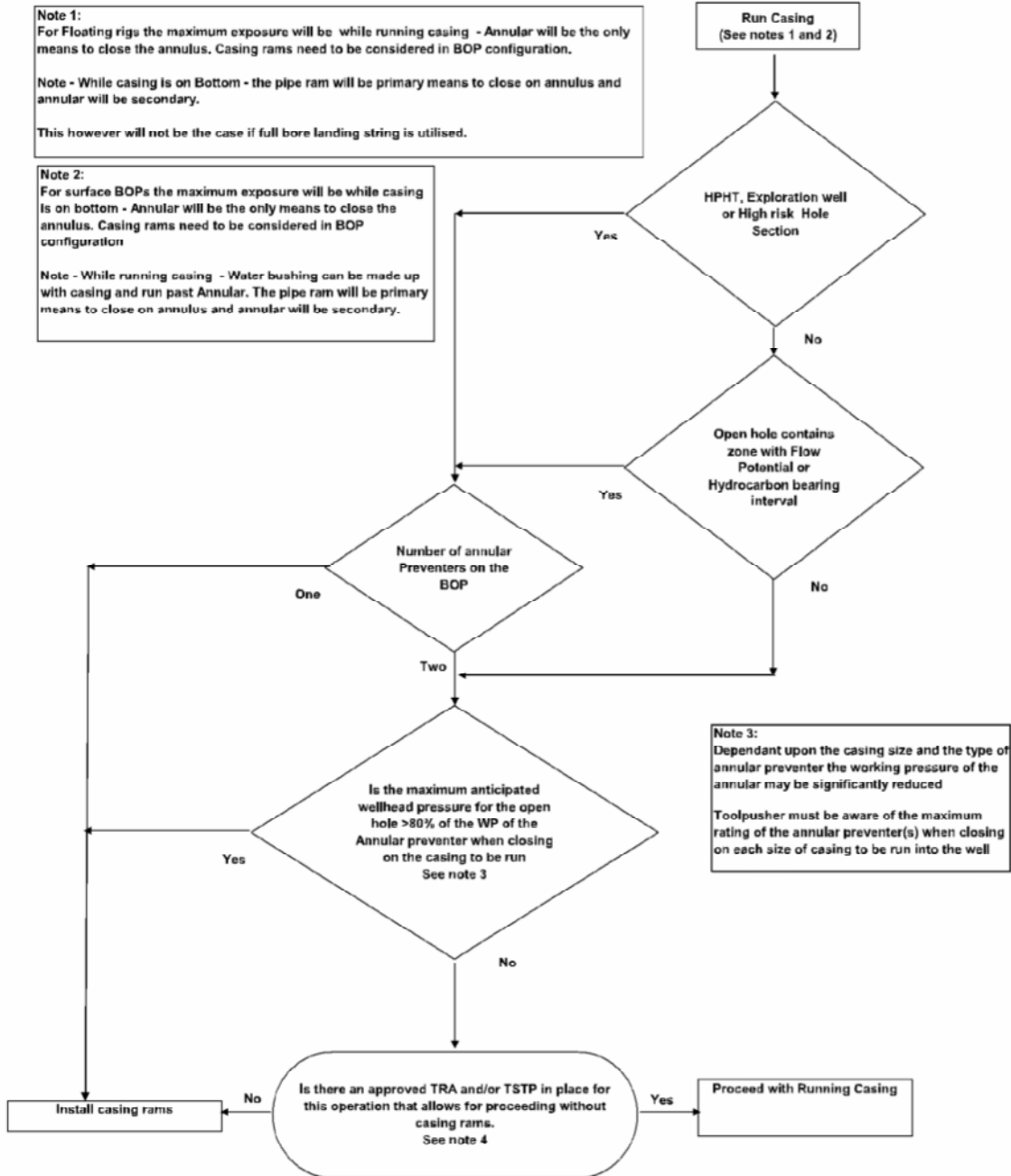
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**ACTIONS UPON TAKING A KICK
SHUT-IN PROCEDURES**

Figure 5.3.1, Casing Ram Decision Tree



Note 1:
For Floating rigs the maximum exposure will be while running casing - Annular will be the only means to close the annulus. Casing rams need to be considered in BOP configuration.

Note - While casing is on Bottom - the pipe ram will be primary means to close on annulus and annular will be secondary.

This however will not be the case if full bore landing string is utilised.

Note 2:
For surface BOPs the maximum exposure will be while casing is on bottom - Annular will be the only means to close the annulus. Casing rams need to be considered in BOP configuration

Note - While running casing - Water bushing can be made up with casing and run past Annular. The pipe ram will be primary means to close on annulus and annular will be secondary.

Note 3:
Dependant upon the casing size and the type of annular preventer the working pressure of the annular may be significantly reduced

Toolpusher must be aware of the maximum rating of the annular preventer(s) when closing on each size of casing to be run into the well

Note 4:
Considerations for TRA/TSTP:
Reservoir knowledge and experience
Problems when drilling the section (losses, kick etc)
Ability to move off location - Floaters
Ability to drop the casing
Run on Drillpipe or fullbore landing string - Floaters
Liner (length of liner vs water depth) - Floaters
What is across the BOP at the various stages of the operation (running, landing, cementing etc.)
Amount of work the annular has completed since last inspection
Ability to shear the casing
Collapse rating of the casing to be run

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Figure 5.3.2, Shut-In Procedures

