

## Bi-Center Drill Out Procedure

### Rotary and PDM Configurations

#### Preparation to Making up Bi-Center to the BHA

- Inspect previous run dulled bit to make sure that it is in gauge and there is no damage to the bit. If the previous run dull bit is under gauge then a reamer run must be made prior to TIH with the Bi-Center bit. Do not ream the hole with a Bi-Center bit as the bit will be un-stabilized in the hole and will result in a damaged Bi-Center bit.
- Agree on BHA to be used with Bi-Center bit based on well trajectory that is required to accomplish the target objectives.
- Perform hydraulic calculations to maximize Bi-Center bit performance for the interval.
- Nozzle the Bi-Center bit so that 60% of flow goes through the pilot bit and 40% passes through the reamer. This is accomplished by changing nozzle sizes in the pilot bit and reamer to meet the percentage requirement. This nozzle configuration is good for almost all drilling conditions. Some harder drilling conditions require a 70% pilot and 30% reamer split. Some washable formations may require a 40% pilot and 60% reamer split to maintain pilot hole anchor effect. Consult your Varel representative for advice if not sure.
- Varel Bi-Center bit spec sheets will have 3 sizes shown across the top of the spec sheet such as 8-1/2" x 9-1/2"x6-3/4". The first dimension is the pass through size of the Bi-Center bit. The second dimensions is the drill size or opened hole size. The last dimension, in the case 6-3/4", is very important because it determines the largest diameter tubular that can be run within 30' of the Bi-Center bit. Make sure that the BHA does not have a tubular that exceeds that diameter within 30' of the Bi-Center bit or damage to the Bi-Center bit could occur while tripping in the hole.
- Stabilizers can be used with a Bi-Center run and must be no larger than pass through size of the Bi-Center being run. They must be run at least 30' above the Bi-Center bit in the string. Check the Varel spec sheet for pass through size of the Bi-Center bit and ask your Varel representative for assistance if you are unsure.



#### Making up the Bi-Center Drill Bit and TIH

- Bi-Center bits should be handled just like a regular PDC bit on the rig floor. Use the bit breaker to make up the bit on the BHA after properly dropping the pin. Make up torque is recommended on the Varel spec sheet for the Bi-Center bit if needed.
- TIH with no rotation to prevent damage to the Bi-Center bit, BOP, wellhead, and casing. This process should not require any WOB. When filling drill pipe, if using a PDM, reduce flow to a minimum to avoid rotation of the Bi-Center bit.
- Trip slowly through casing shoes, liner hangers, doglegs, tight spots, or ledges. While TIGH it may be required to rotate the drill string slowly through casing shoes and liner hangers to prevent the BHA from hanging up. This is especially true if using a PDM with a bent sub for directional work. Use the slowest possible RPM necessary to move the BHA forward.

[www.varelintl.com](http://www.varelintl.com)

## Drill Out Guidelines

- When drilling out of casing, cement will usually be encountered first. Once tagging bottom has been accomplished and drilling ready to commence, begin rotation of the Bi-Center bit at 100 to 140 RPM. WOB should range between 2000 to 8000 pounds. Operating parameters in casing should always be kept to a minimum to prevent bit and casing damage. Pump rate should be 75% of normal to minimize debris collection on the bit face. Never exceed the recommended operating parameters in casing as damage to the casing and Bi-Center bit may occur.
- Problems can occur when drilling out and some of them can be handled by reciprocating the drill string. Continue circulation and rotate the drill string while reciprocating the drill string to eliminate the problem. Sometimes it is necessary to change operating parameters to cure problems. When changing parameters such as flow rate, RPM, and WOB remember to never exceed the recommended operating parameters while in casing.



## Formation Drilling

- When entering the formation after drill out or as a first step to drill with a Bi-Center maintain Drill Out Guidelines operating parameters. The Bi-Center bit will need to drill forward at least one to two lengths of the bit to establish the new hole in formations. This will help stabilize the pilot bit in the formation allowing the reamer wing to open the hole completely. Once the bit is established in the formation, normal drilling parameters can be used to optimize the drilling performance of the Bi-Center bit. Drill off tests are suggested for best operating performance.
- Reaming with a Bi-Center bit is not any different than a conventional PDC bit although attention must be given to WOB and RPM operating parameters to maintain directional control on rotary applications. Excessive WOB and minimized RPM can lead to loss of directional control of a Bi-Center bit in a rotary application. Higher RPM and minimum WOB result in best operating practices for a Bi-Center bit on a rotary application.
- If bit balling is a problem in the application, use normal procedures to minimize the risk with a Bi-Center run. If the normal procedures for eliminating bit balling do not cure the problem, then controlled drilling with the Bi-Center is recommended to reduce the risk of bit balling.