Drilling with Xs F system

Preparing the equipment

• Insert the welded shoe to the end of the casing. Care most be taking to align the shoe to the squared edge of the casing. Tack weld in three places to hold the shoe in position, and then weld around the casing in the chamfer created between the casing and the shoe using an electrode approx 3/32" in diameter. Grind the weld down afterwards to minimise interference between the welding and the drilled hole. In cold weather, it is recommended that the components to be welded be preheated. Insert the Driver/Bit into the DTH Hammer in the conventional manner, and if a short starter tube is to be used, attach it to the DTH hammer at this time.

Starter Casing

• The crown and first casing assembly should be cut to match the length of the DTH Hammer (or DTH Hammer and starter tube) minus 8". This should put the top of the casing to approximately 2"- 3" below the top wrench flats. This will allow access to the wrench flats and facilitate the adding and removal of drill tubes as drilling progresses.

Casing length

• Ideally, subsequent casing should match the length of each drill pipe. However many casings are of random lengths, and care should be taken when adding random casings not to cover the top wrench flats of the drill pipe, or be too low for the reach of the diverter. It is desirable to measure each casing and record the length on it so that it is known before adding to the column. Occasionally a casing can be cut to offset these discrepancies.

Assembling the Driver and floating ring

• Locate the Diverter into the raised position by raising the control handle. With the winch, raise the driver/bit, the DTH hammer and starter tube assembly and attach it to the thread of the saver sub on the rotation head. Raise the assembly and rotation head high into the drill mast to allow the casing to be positioned. With the winch, lift the starter casing with the crown onto the drill table, and secure. Slowly guide the driver bit into the starter casing and feed it all the way down to the crown.

Insert the driver through the welded shoe until it stops against its shoulder. Install the floating ring over the driver by its locking ways and turn by hand clockwise. The floating ring is now installed and ready to drill. For security reasons, it is not recommended at this point to lift the drill string and casing only by the floating ring. Care most be taken to secure the casing with the winch cable

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Starting to Drill

• Drilling is started by lowering the starter casing with the driver to the ground whilst slowly rotating with the hammer air supply partially on. As the driver bit closes into the DTH hammer, it will start to drill. (Note, it is easier to start a casing hole with an air pressure of less than 200psi) It is imperative that the operator monitors the discharge pipe to ensure a good flow of debris. Once the casing starts penetrating the ground, it is advisable to commence water and/or foam injection. When the casing is level with the drill table, drilling is stopped and the hammer air turned off. The diverter is raised (if using Xs air diverter) to expose the flats on the top of the starter tube which can then be secured in the table with the drill tube wrench. The rotation head can then be unscrewed and travelled to the top of the mast.

Adding Casing

• The length of casing should match the length of the drill pipe. Many casings are of random length, and care should be taken when adding casings not to cover the top wrench flats of the drill pipe. It is desirable to measure each casing and record the length on it so that occasionally a casing can be cut to offset any discrepancies. Drill tubes need to be inserted into the casings whilst in the horizontal position, preferably on the ground. This can be done manually or with a draw cable.

To lift the assembly into the drill mast, it is recommended that a proper double hook and chain be attached to the winch. The drill tube/casing assembly is then raised into the mast, the upper drill tube thread aligned into the saver sub and the two screwed together. The winch with the casing still engaged can then be lowered until the hook sits on the drill table leaving the drill tube hanging from the rotation head. The winch rope can now be loosened, allowing the top loop to run down the casing.

A sling can now be attached to the casing, and then the casing lifted enough to allow the hook to be disengaged. At this point, the drill tube is to be engaged and tightened onto the tube held by the wrench below. The casing is then lowered onto the previously drilled casing, clamped into position and tack welded in three places. The casing joint should then be welded all around using an electrode approx 3/32”in diameter not forgetting to grind the weld down afterwards to minimise interference between the crown and the drilled hole. In cold weather, it is recommended that the components to be welded be preheated.
The sling can now be removed from the casing.

Continuing to Drill

• Lower the Diverter onto the casing with the control handle if using Xs air diverter. Drilling can now recommence by slowly rotating with the hammer air supply on, and water and/or foam injection engaged. As the driver bit closes into the DTH hammer, it will start to drill. With the addition of each casing, only sufficient down thrust should be applied to make the DTH hammer run smoothly. Again, it is important that the operator monitors the discharge pipe to ensure a good flow of debris.
Drilling can continue in this manner until the top of casing is level with the drill table where the whole process starts over again.

Retrieving the driver bit

• When the casing is drilled to the desired depth, it is recommended to thoroughly flush the driver bit with air, water and foam (if available). This will help in the disengagement process. The driver/bit can be disengaged from the casing crown by reversing the rotation. This can be done with the DTH hammer in the lifted position to allow the hammer to go into the by-pass mode, which allows more flushing air and fluids to pass. The driver should then be rotated in reverse approximately 1/8 of a turn and then lifted. If the driver is disengaged, the drill tubes will rise leaving the casing in the hole. If the driver bit does not disengage on the first attempt, rotate it back and for into and out of the locked position with the rotation motor. After the driver/bit is disengaged, pull all the drill tubes out of the casing in the conventional manner, with the hammer air on and slowly rotating in the drilling direction.