



**Borais Petroleum Investment Co.**

**SLOT RECOVERY SERVICE  
General Procedures**



# Slot Recovery Procedures:

## Slot Recovery Running Procedures

### 1. Cut And Retrieve Operation:

**Borais's cut and retrieve equipment:**

#### 1. Goliath Guillotine Pipe Saw & Sub Sea dual pin drill.

## **Goliath Guillotine Saw**

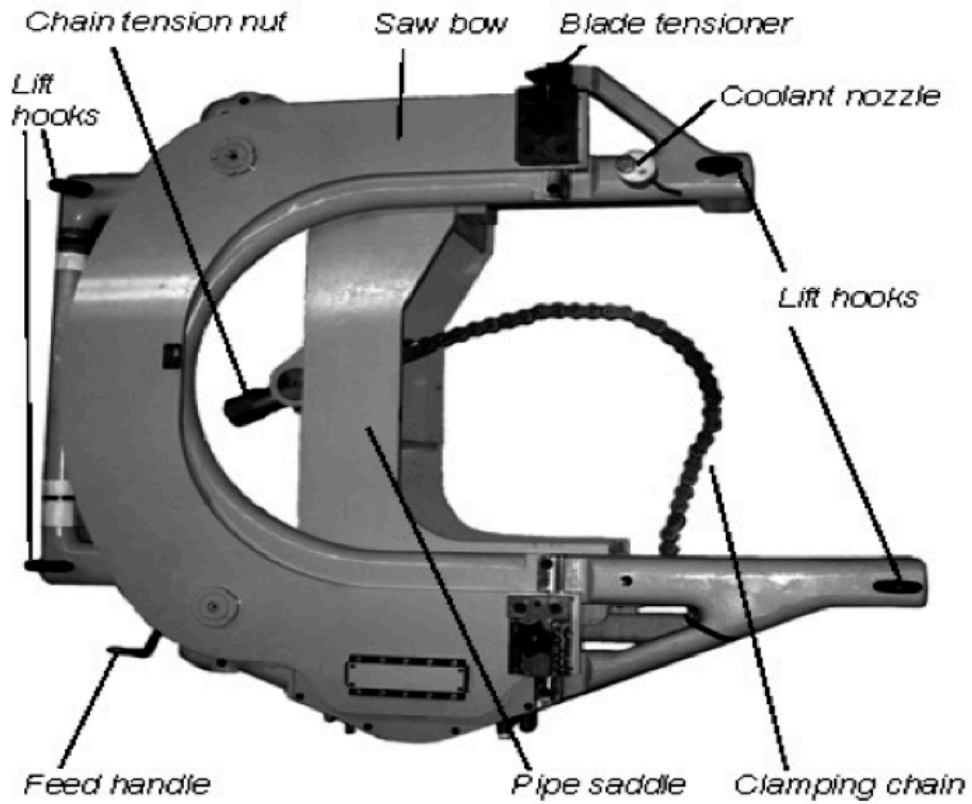
### USAGE AND APPLICATIONS

The Goliath Guillotine is designed to cold-cut pipes, solids, and multi-stranded casing strings from 16" to 32" (41 to 81 cm) in diameter. The Goliath is easy to set up, even sub-sea, and is available with an auto clamp option and topside controls for remote operation.

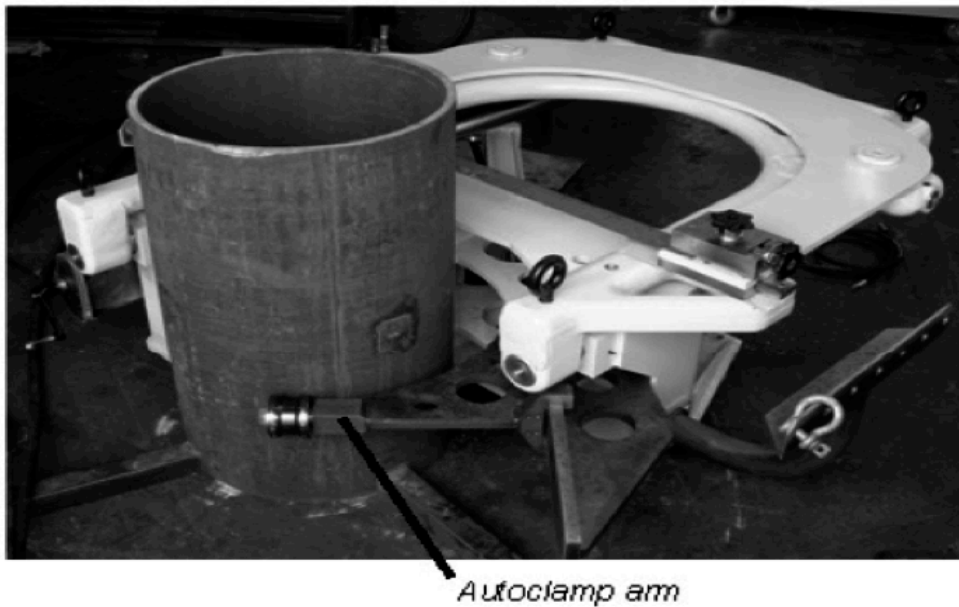
The Goliath Guillotine operates on hydraulic power, with two heavy-duty hydraulic motors requiring a power source with 15 gpm flow at 1500 psi (standard) or 15 gpm @ 2000 psi (autoclamp).

Figure 3-1 illustrates the components of the standard Goliath Guillotine. Figure 3-2 shows the saw with the optional auto clamp.

The auto clamp arm closes under hydraulic power and holds the pipe in the pipe saddle during cutting.



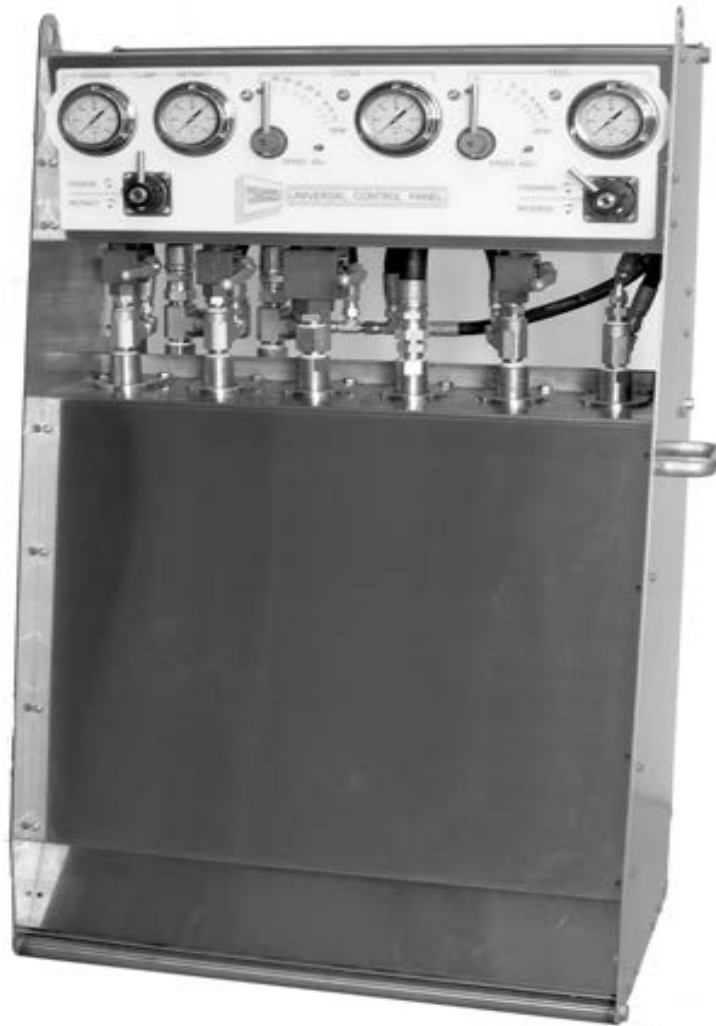
*Figure 3-1. Components of the standard Goliath Guillotine are illustrated.*



*Figure 3-2. Goliath with autoclamp accessory.*

## MACHINE CONTROL

The topside control unit (TCU) provides remote controls for up to three hydraulic drives. On the Goliath Guillotine, one drive controls the saw motion, and two are used for options: the auto clamp mechanism and the hydraulic auto feed.



*Figure 3-3. The topside control unit (TCU) has controls for the cutting and optional clamping and feed drives on the Goliath Guillotine. It has inputs for hydraulic power and separate outputs and controls for up to three drives.*

## HPU 46 Offshore Hydraulic Power Unit



*HPU 46 Offshore Hydraulic Power Unit with Kubota 46 horsepower water cooled diesel engine, air start, disc type spark arrestor, air intake shut down, dual high performance gear pump system for 16 GPM & 8 GPM. Two circuits at maximum pressure of 2800 PSI (190 Bar). Shipped without hydraulic oil.*



## **SPECIFICATIONS**

Capacity	16-32" (41-82 cm) diameter pipe
Hydraulic requirements	Standard: 15 gpm @ 1500 psi (57 l/m @ 103 bar) Autoclamp: 15 gpm @ 2000 psi (57 l/m @ 138 bar)
Feed system	Manual or mechanical autofeed (selectable by operator)
Autofeed rate (per cycle)	Low speed: 0.008" (0.020 cm) High speed: 0.016" (0.041 cm)
Dimensions (standard)	Length: 76.5" (194 cm) Width: 66" (168 cm) Height: 25" (63.5 cm)
Dimensions (with autoclamp)	Length: 82.5" (210 cm) Width: 78" (198 cm) Height: 25.9" (65.8 cm)
Weight	Standard: 1800 lbs (818 kg) Autoclamp: 2100 lbs (955 kg)
Finish	Painted cast surfaces; chrome-plated rods; Other components zinc-nickel iridescent

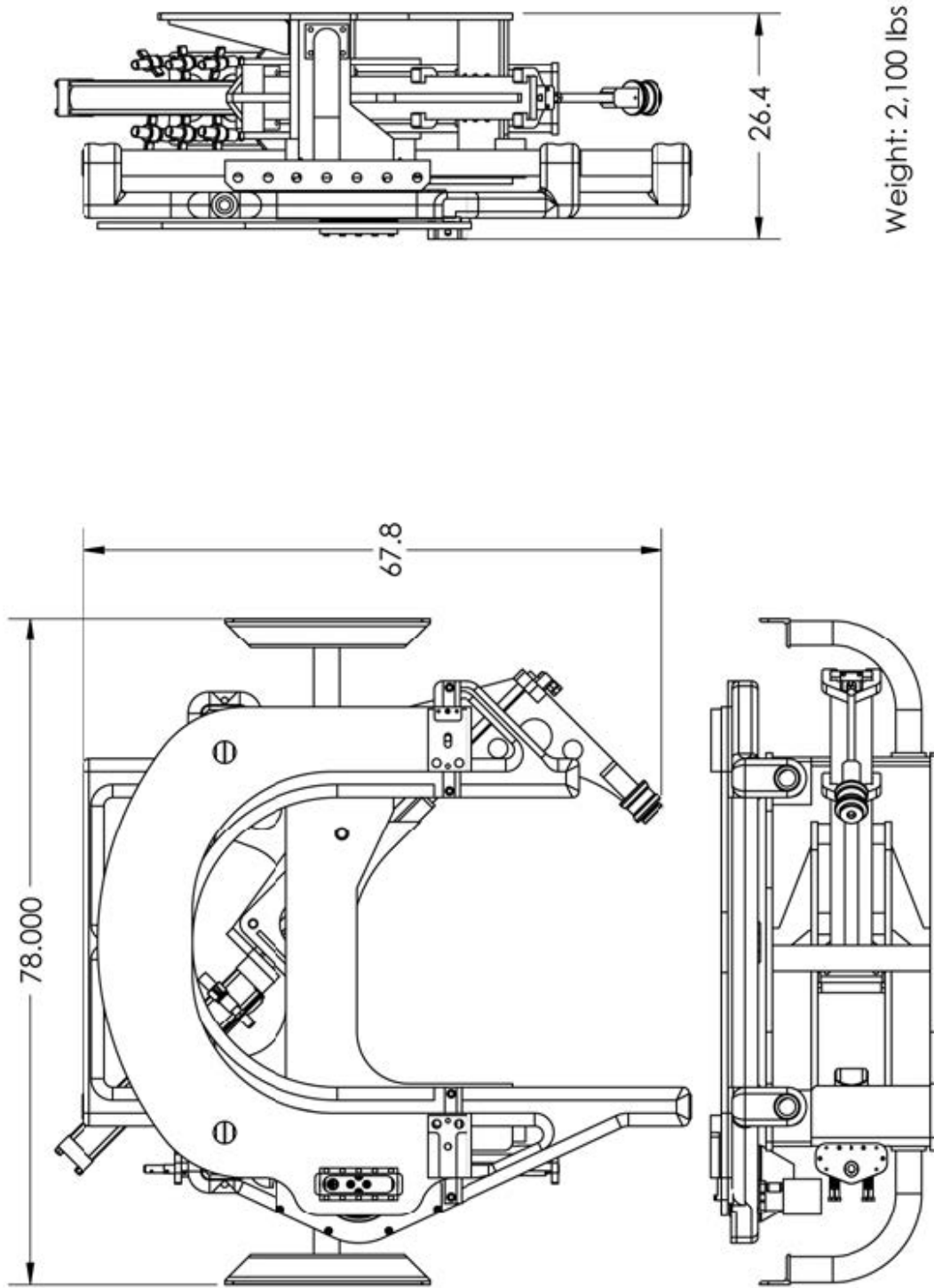


Figure 3-4. The drawing shows the operating envelope for the Goliath.



## **Cut and retrieve procedures:**

1. Drill a hole about 4.25" OD through all CP and casings in order to insert lifting bar which will secure all casings and CP together.
2. Insert lifting bar.
3. Apply tension to the casing string equal to casing and CP weight plus 10% of weight of casing and CP.
4. Use Rig hoist line to lower Borais Multi String Cutter (BMSC) to seabed, with diver assistance.
5. Lower the second rig hoist line in the slot and next to the CP that needed to be cut at the required cutting depth.
6. Divers should install pulley at the required cutting depth (5 ft. above the funnel guides at sea bed level) and pass the second line through it(90 degrees angle).
7. Hook BMSC to the second line and start to slowly slack off first line and retrieve second line till the saw is set around the CP.
8. Divers will confirm that saw is in place.
9. Borais operator will use surface control panel to auto clamp the saw around the CP.
10. Borais operator will start the cutting operation.
11. Lifting bar will be insert to secure all casing inside the 30" CP through a hole drilled through 30" CP and all casing inside it.
12. Apply 5% over tension of all CP and casings weight on the lifting bar.
13. Clamp the BMSC around the 30" CP.





14. Start cutting operation as per below image.



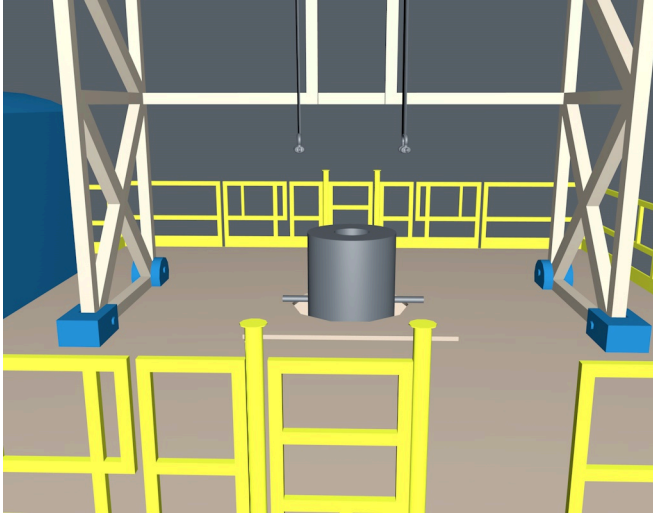
15. MBSC will cut 30" CP and all casings inside in 1.5 hr.

16. While cutting CP, when cutting blade half way through cutting CP, divers should install wedges to prevent the CP from breaking the blade.

17. When cut is finished, retrieve BMSC to surface.

18. Start to retrieve the casing and CP.

19. When the 30" CP reaches the rotary table, drill a hole to place a longer lifting bar to secure the 30" CP and slips and safety clamp rotary table as per below images.

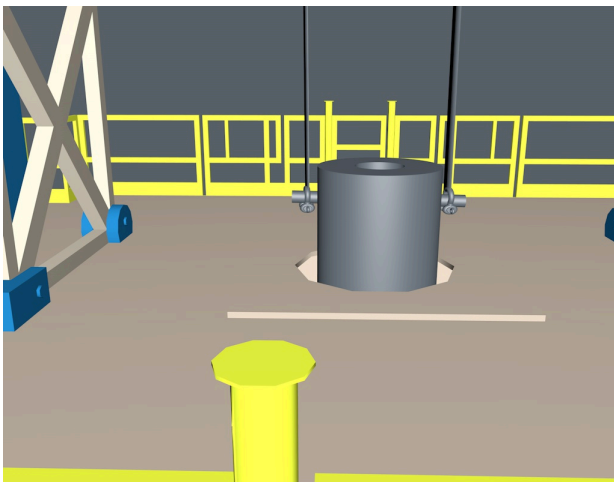


20. Hook slings to lifting bar and start pulling the CP 10-15 ft. up as per below image.

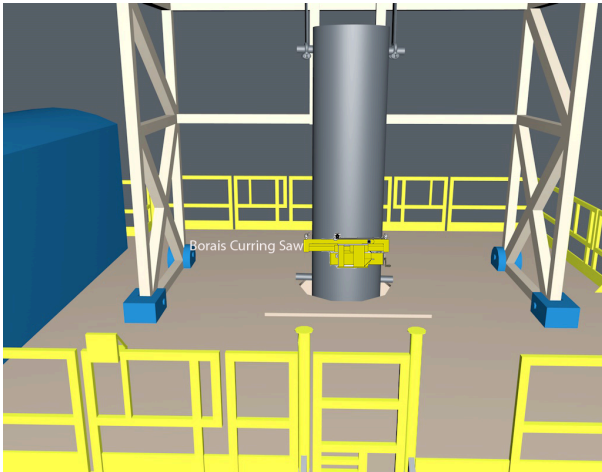
21. Put the CP in slips and secure all casing inside by lifting bar.

22. Set the CP on slips at rotary table.

23. Drill a hole above the slips, and insert another bar to secure the casing.



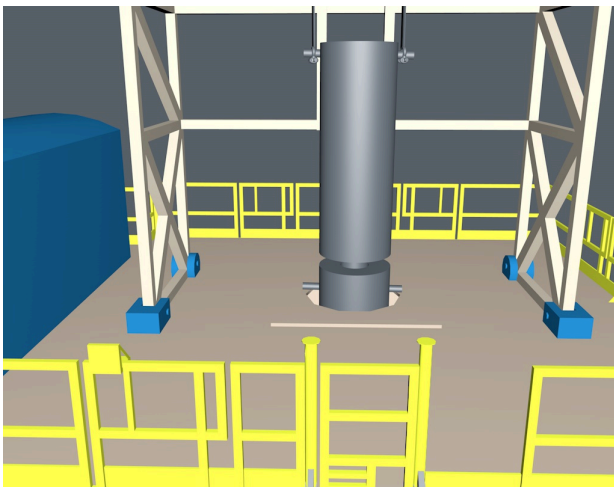
24. Start cutting the 30" CP 1-2 ft. above the lifting bar as per below image.



25. Place BDPD around CP at rotary table.

26. Start drilling hole.

27. Place another lifting bar in the drilled hole as per below image.



28. Rest CP in slips on rotary table while the lifting bar is inserted.

29. Place BMSC 1-2 feet above the lifting bar.

30. Start cutting the 30" CP.

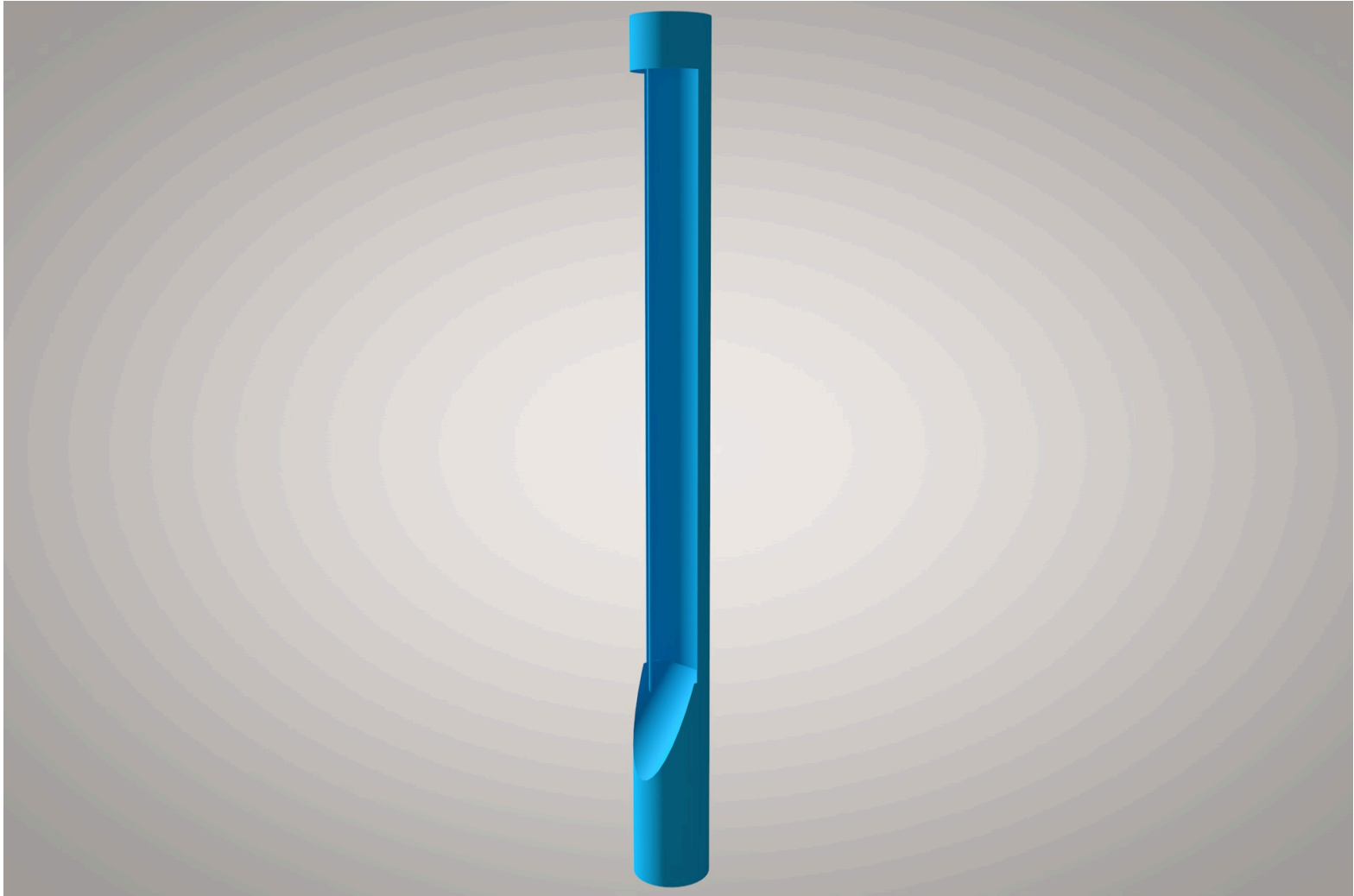
31. L/D the cut piece.

32. Repeat steps 21 through 33 till the CP is full retrieved.



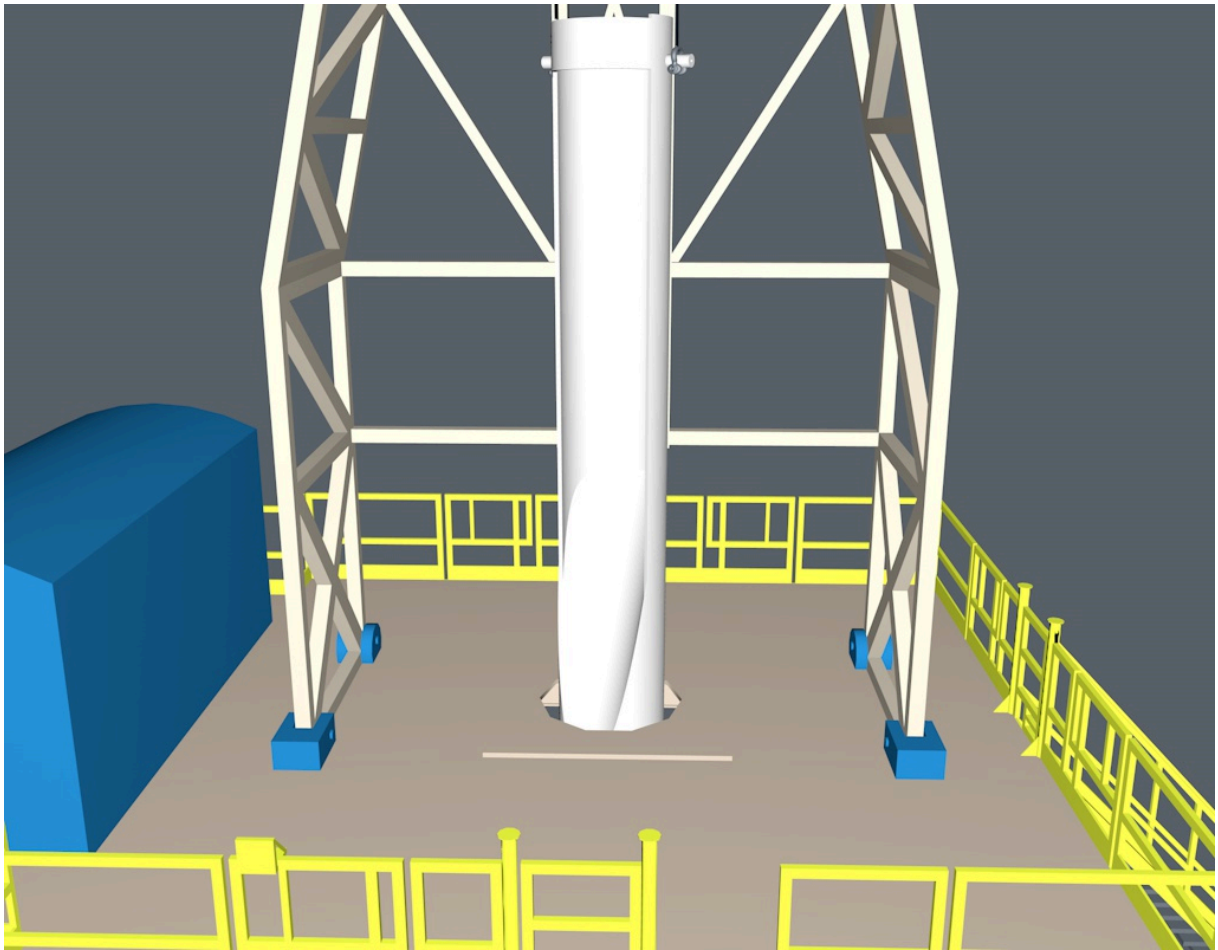
**Borais OS-DCS tool :**

The tool is designed especially to over come the problems of gas bubbles during SR operations:

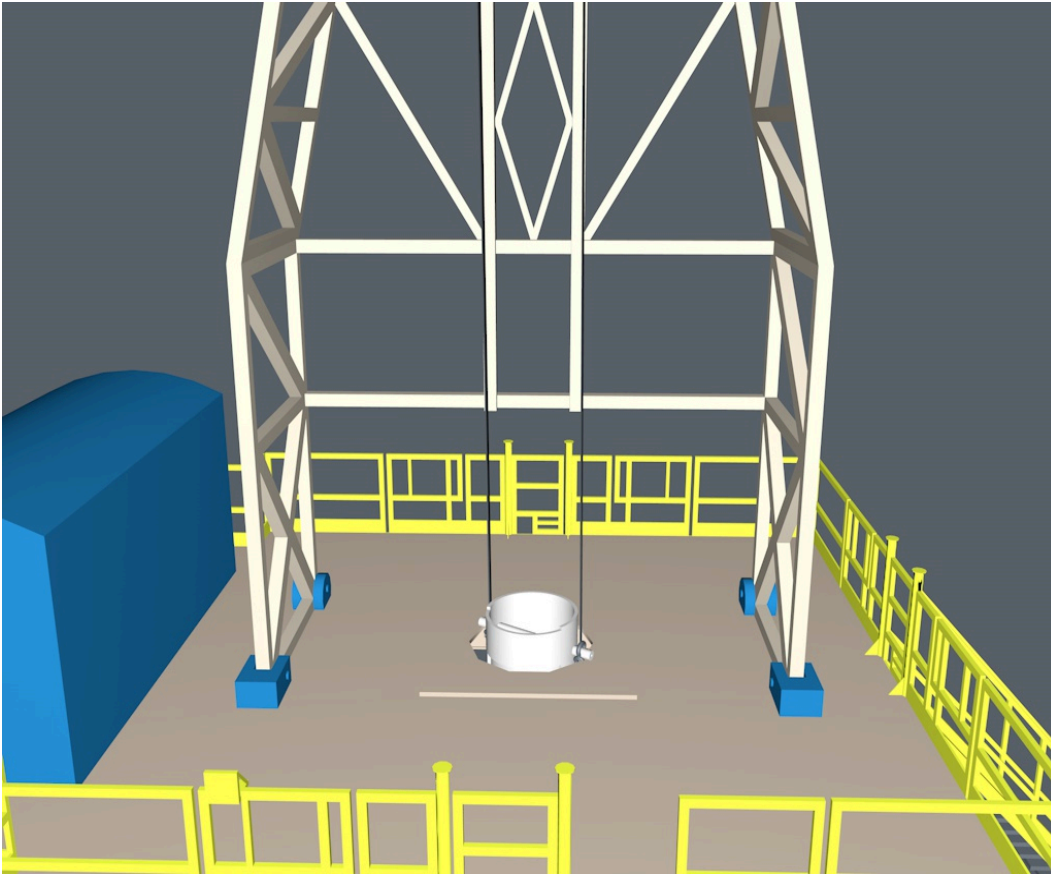


### **Borais DCS Running Procedures:**

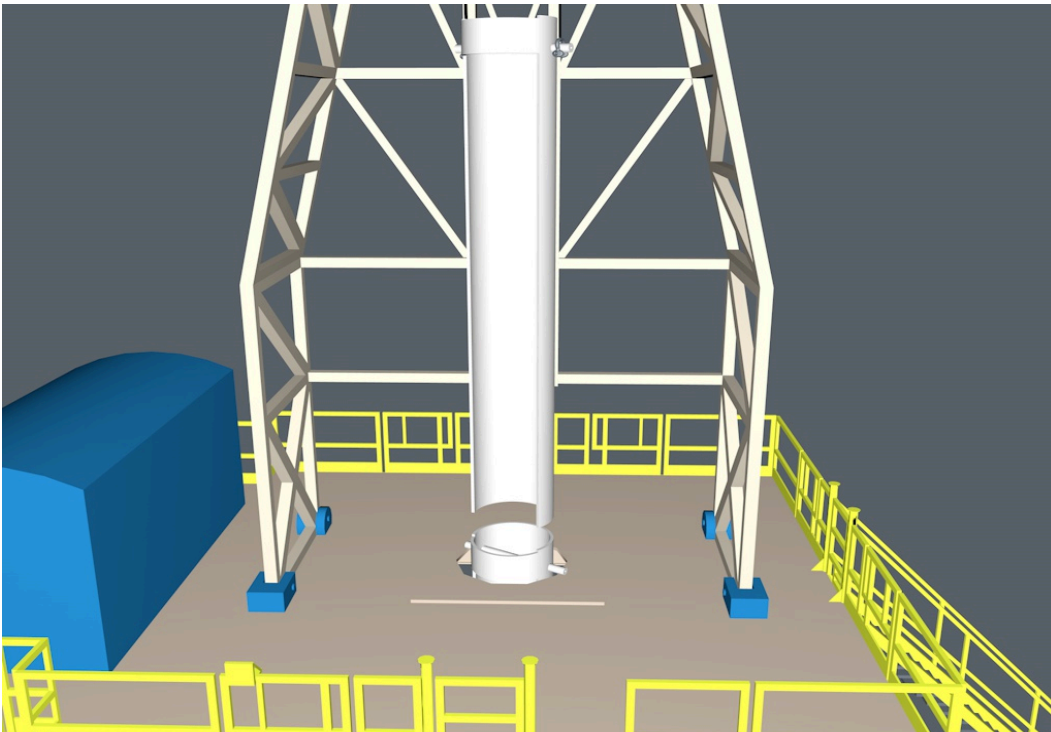
- 1- Commence hot tapping operations to determine if there is any trapped gas in the annuals.
- 2- Weld pad eyes on top of DCS joints and the rest of the joints that will be connected to the DCS till rotary table.
- 3- New Direction Deg.
- 4- P/UP first DCS joint by using pad eyes



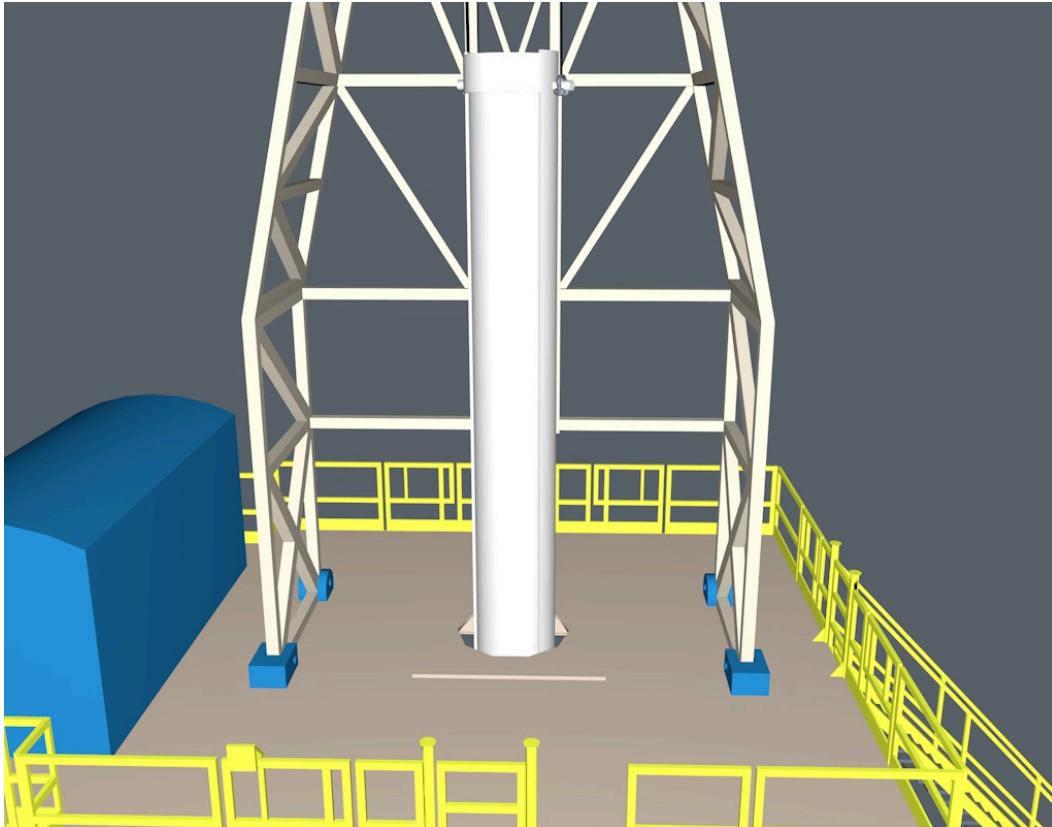
5- RIH the first joint.



6- P/UP the second DCS joint and weld it to the top of first joint at rotary table.



7- RIH the 2 welded Joint.

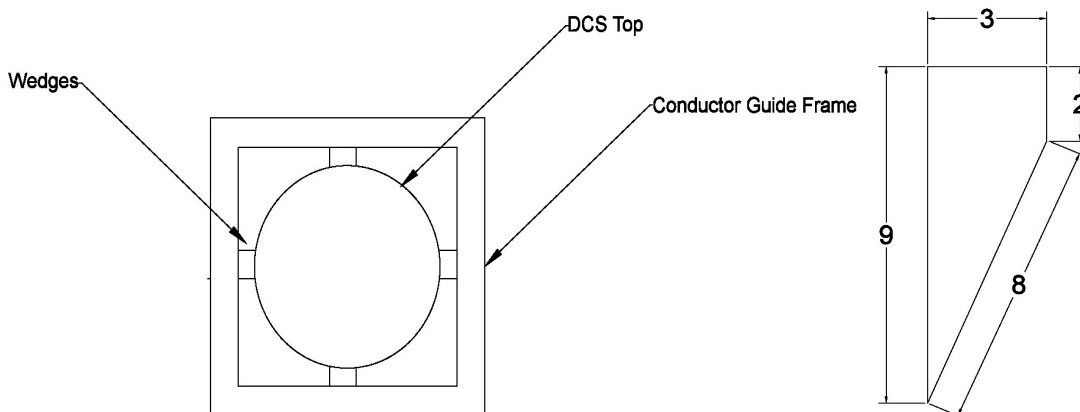


8- Please repeat till Borais DCS bottom swallow old stub.

9- After swallowing old stub, start pumping cement from the side pipe in the DCS to fill the bottom of DCS with cement.

10- Wait on cement.

11- Secure DCS at production Level by welding wedges between DCS and the CP Frame at production level.



12- Start running new Conductor.