



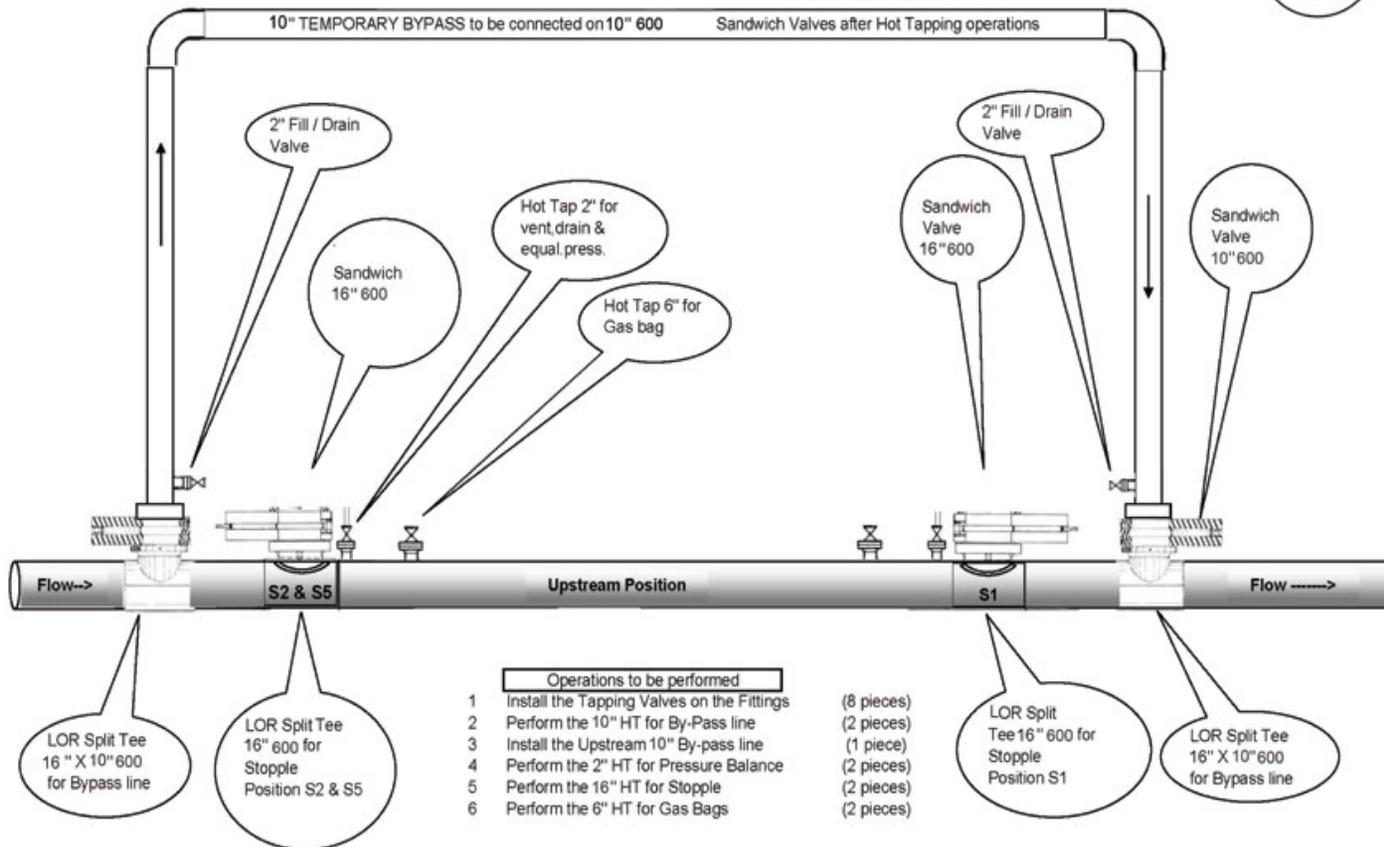
**Hot Tapping
And Line Stopping**

MIRAGE
MACHINES

کردن پاشا زو پیکم صنفت ابزار

By Pass Taps Upstream
Step # 1
Upstream Site

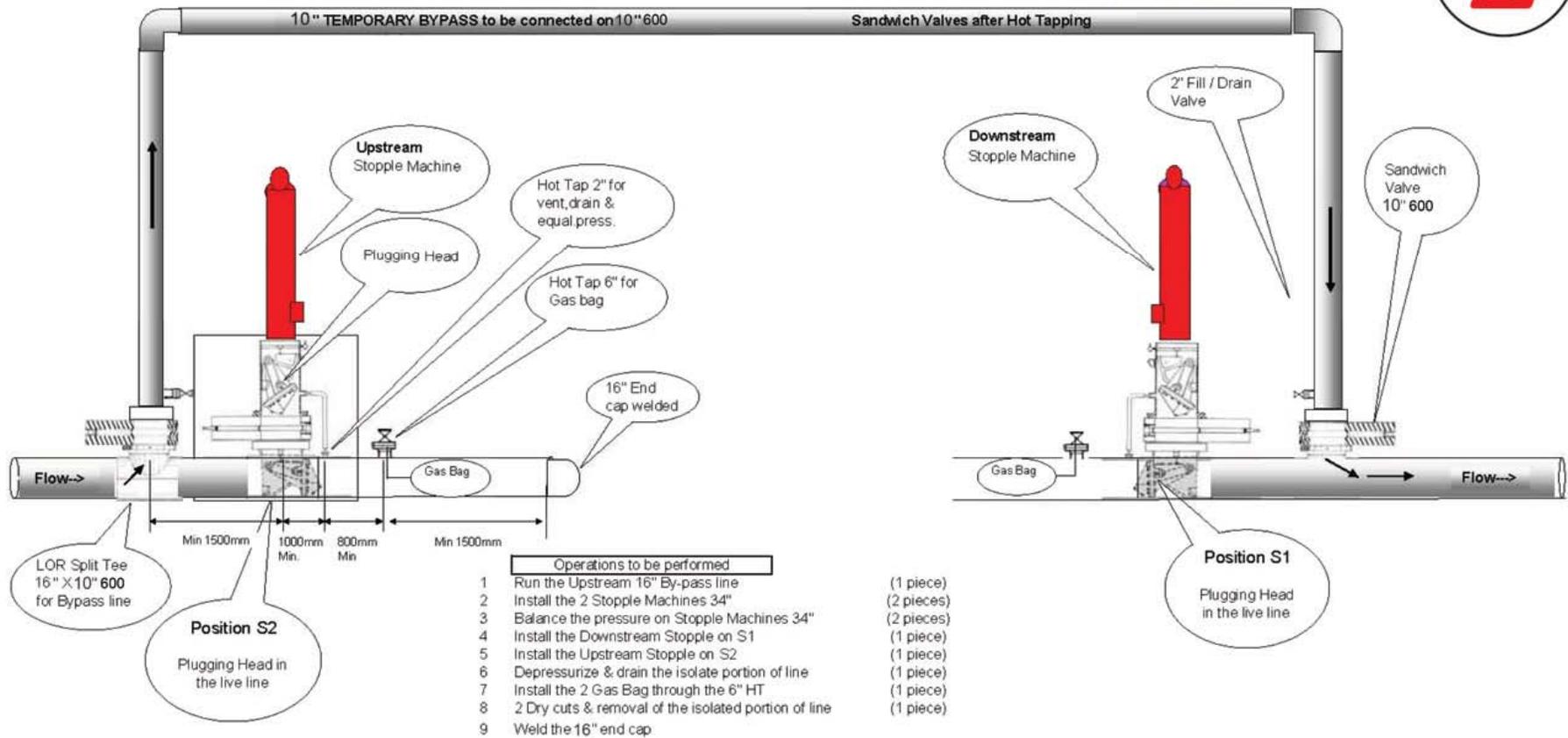
1





Stopples S1-S2
Step # 2
Upstream Site

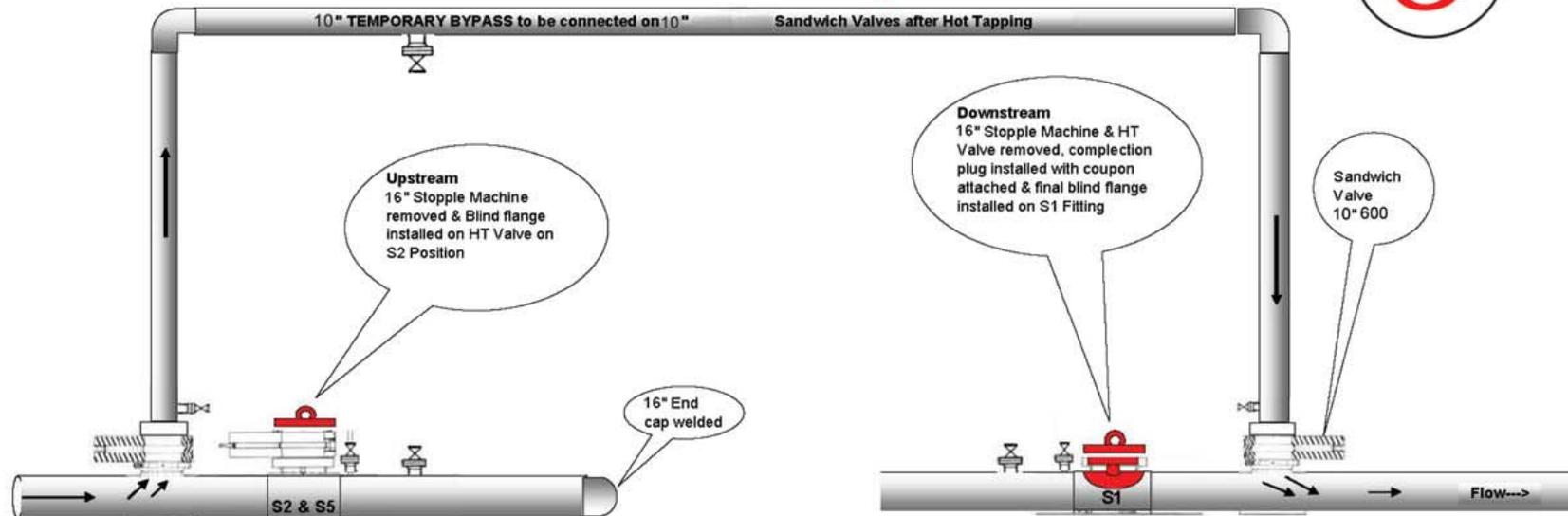
2





Removing Stopple S1-S2 Step # 3 Upstream Site

3



Operations to be performed

- | | | |
|----|--|------------|
| 1 | Remove the Gas bags from 2 isolated lines | (2 pieces) |
| 2 | Fill & pressurize the end cap trunk line | (1 piece) |
| 3 | Retract The Stopple on S2 | (1 piece) |
| 4 | Remove Stopple machine from S2 | (1 piece) |
| 5 | Install the 16" blind flange on Tapping Valve S2 | (1 piece) |
| 6 | Fill & pressurize the Pig Launcher trunk line | (1 piece) |
| 7 | Retract The Stopple on S1 | (1 piece) |
| 8 | Remove Stopple machine from S1 | (1 piece) |
| 9 | Install the 16" LOR plugg with coupon attached on S1 | (1 piece) |
| 10 | Remove the 16" Tapping Valve from S1 | (1 piece) |
| 11 | Install the 16" blind flange on stopple fitting S1 | (1 piece) |
| 12 | Install the 6" LOR plugg on S1 | (1 piece) |
| 13 | Install the 2" TOR plugg on S1 | (1 piece) |

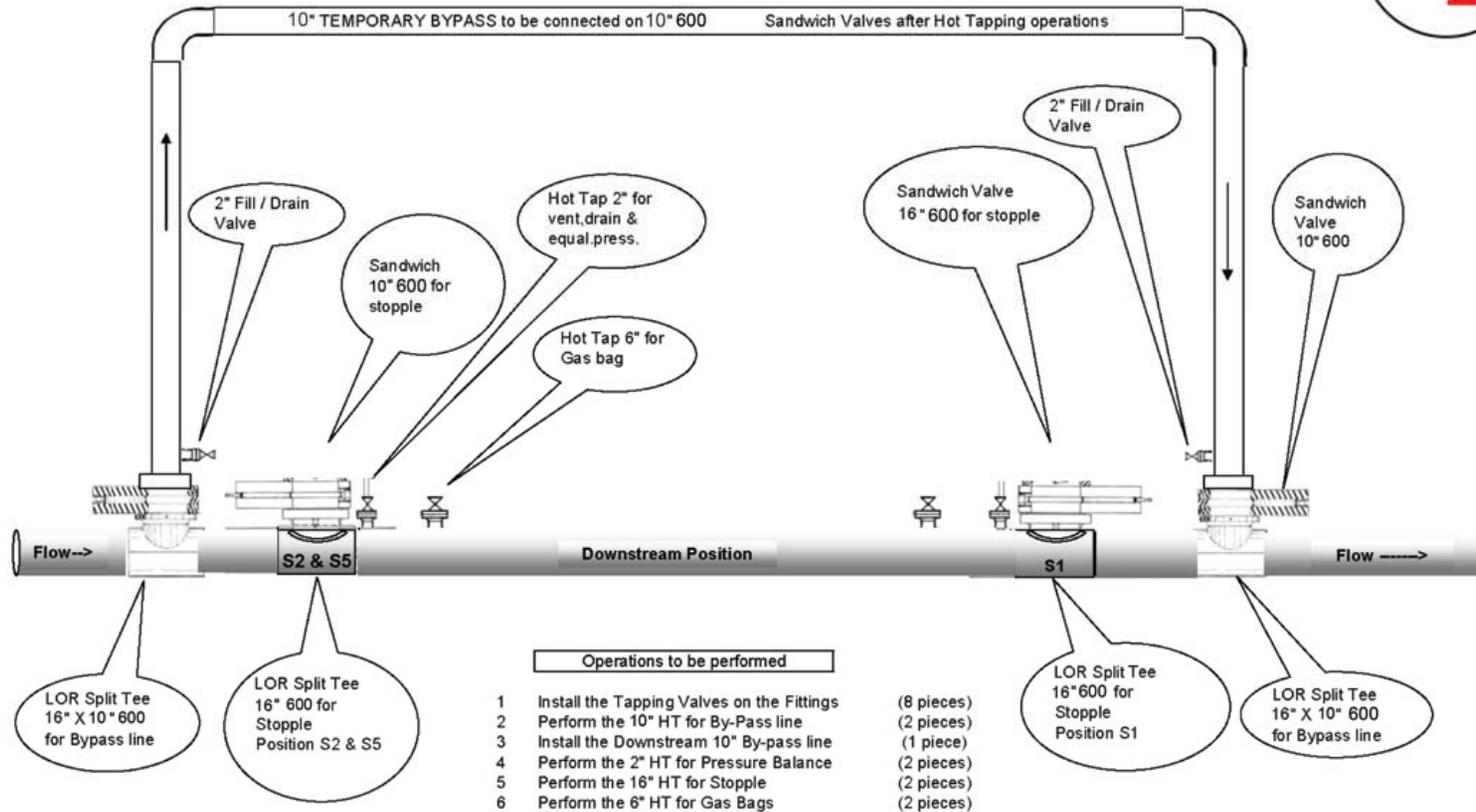






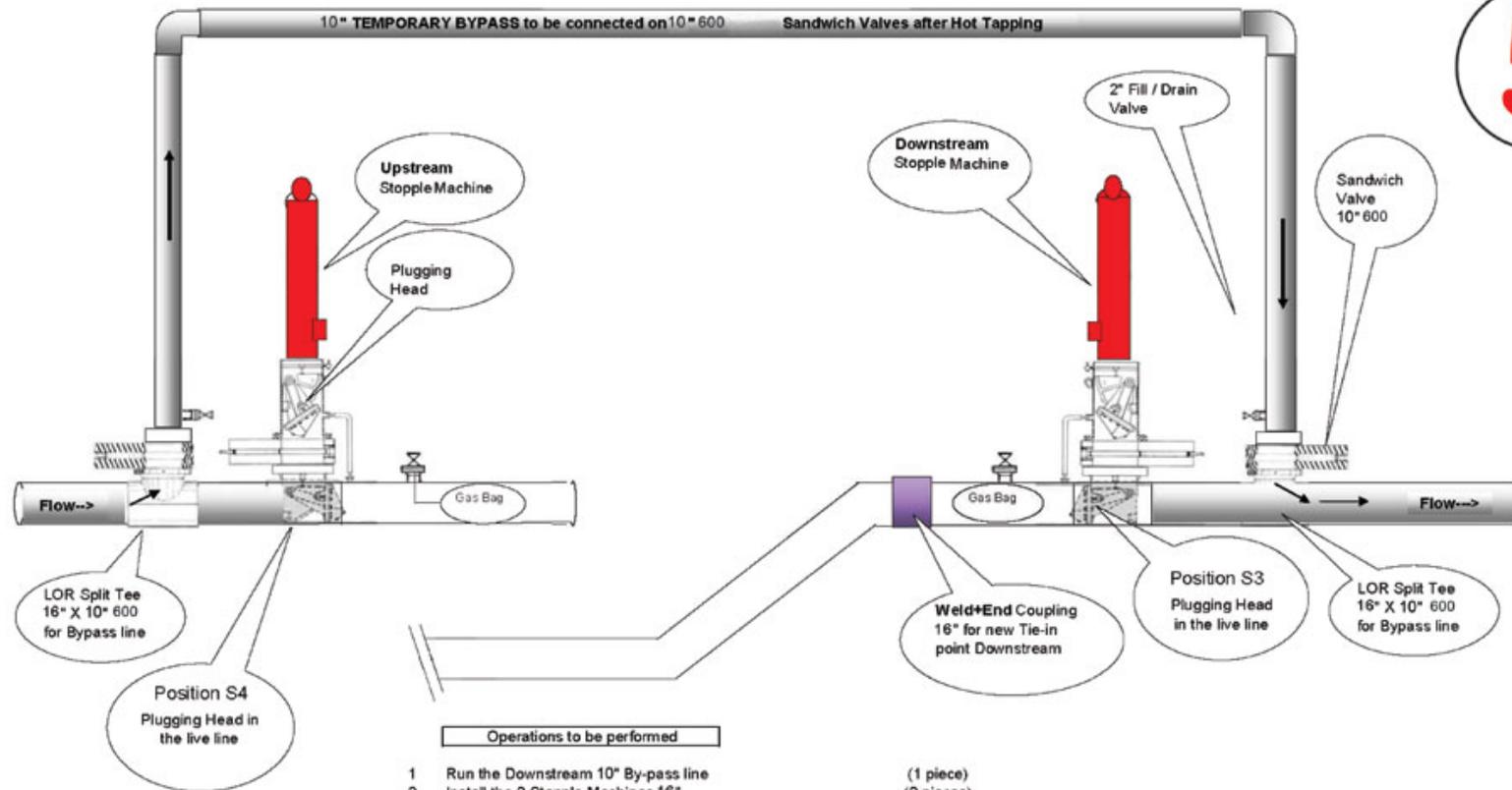
By Pass Taps Upstream Step # 4 Upstream Site

4



Stopples S1-S2
Step # 5
Downstream Site

5

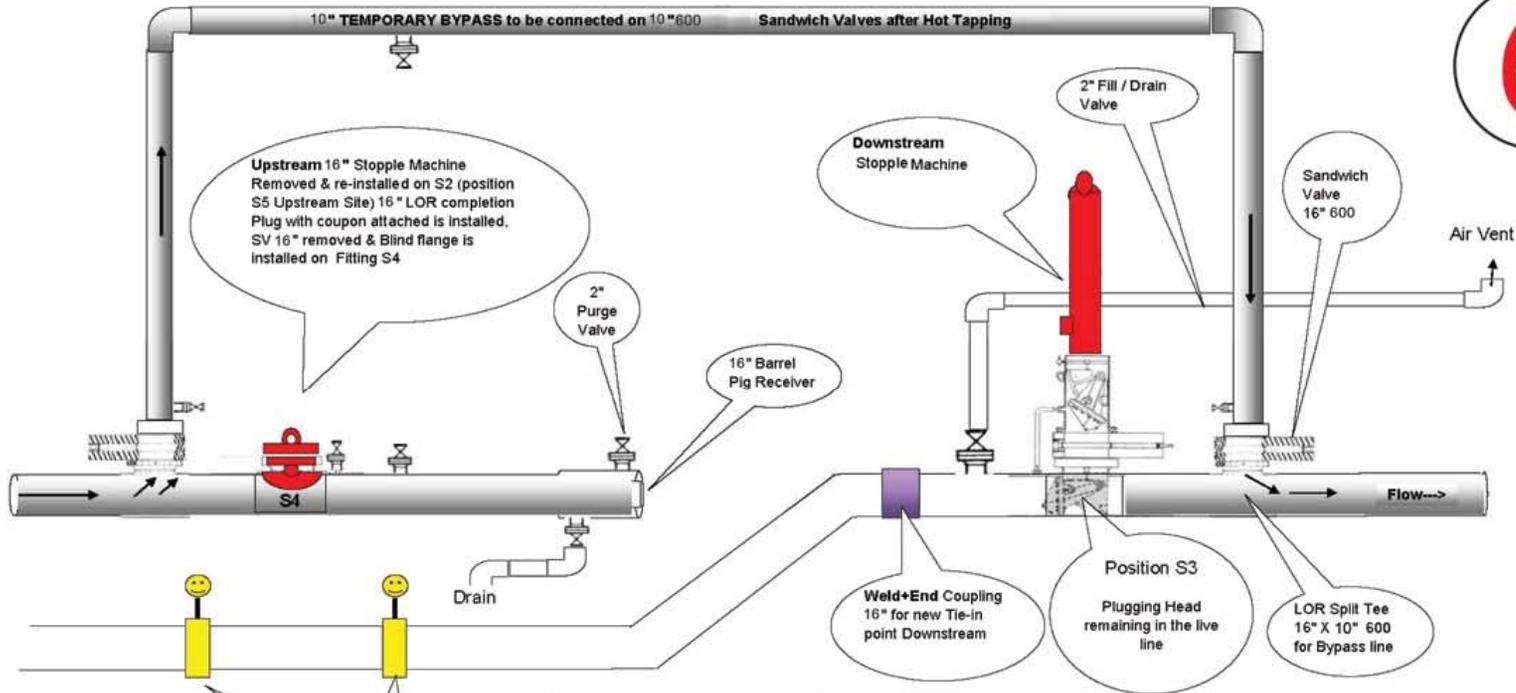


Operations to be performed

- | | | |
|---|--|------------|
| 1 | Run the Downstream 10" By-pass line | (1 piece) |
| 2 | Install the 2 Stopples Machines 16" | (2 pieces) |
| 3 | Balance the pressure on Stopples Machines 16" | (2 pieces) |
| 4 | Install the Downstream Stopples on S3 | (1 piece) |
| 5 | Install the Upstream Stopples on S4 | (1 piece) |
| 6 | Depressurize & drain the isolate portion of line | (1 piece) |
| 7 | Install the Gas Bag through the 6" HT | (2 pieces) |
| 8 | Dry cuts & removal of the isolated portion of line | (2 pieces) |

Removing S4 Step # 6 Downstream Site

6



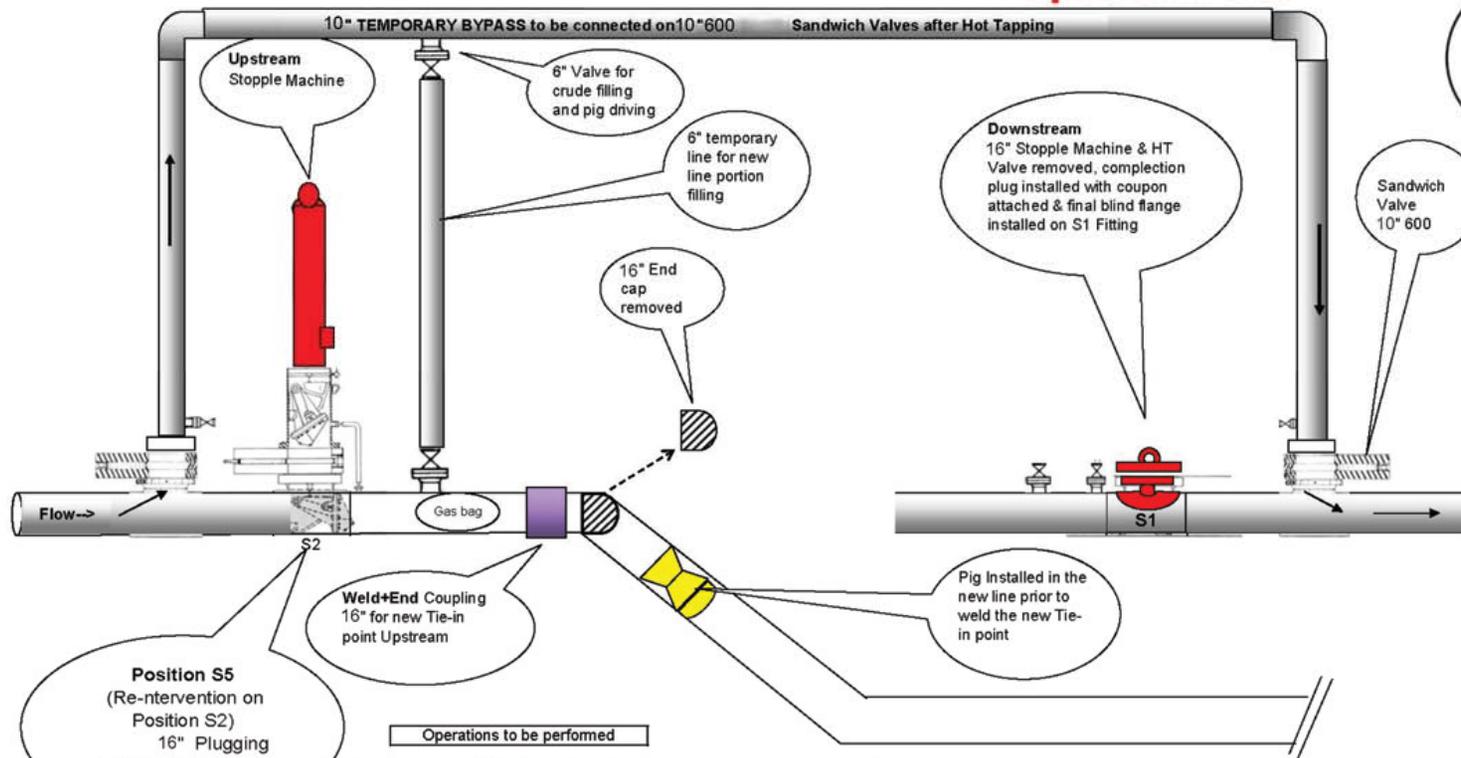
Operations to be performed

- | | | |
|---|---|------------|
| 1 | Remove the Gas bags from 2 isolated lines | (2 pieces) |
| 2 | Fill & pressurize the Pig Receiver trunk line | (1 piece) |
| 3 | Retract The Stopple on S4 | (1 piece) |
| 4 | Remove Stopple machine from S4 | (1 piece) |
| 5 | Install the 16" LOR plug with coupon attached on S4 | (1 piece) |
| 6 | Remove the 16" Tapping Valve from S4 | (1 piece) |
| 7 | Install the 16" blind flange on stopple fitting S4 | (1 piece) |

NI PIG-SIGNALER
To indicate Pig Arrival

Stopple S5-S3 Step # 7 Upstream Site

7



Operations to be performed

- | | | |
|---|--|-----------|
| 1 | Remove 16" blind flange from S2 | (1 piece) |
| 2 | Re-install 16" Stopple Machine on S3 | (1 piece) |
| 3 | Install the 16" Stopple in the Line | (1 piece) |
| 4 | Depressurise & drain the isolate portion of the line | (1 piece) |
| 5 | Install gas bag on isolate portion of line | (1 piece) |
| 6 | Dry cut the 16" Welded end cap | (1 piece) |
| 7 | Install Cleaner Pig in the new 16" line | (1 piece) |
| 8 | Connect and weld the New 16" line | (1 piece) |

Position S5
(Re-intervention on Position S2)
16" Plugging Head in the live line

Weld+End Coupling
16" for new Tie-in point Upstream

Pig Installed in the new line prior to weld the new Tie-in point

Downstream
16" Stopple Machine & HT Valve removed, completion plug installed with coupon attached & final blind flange installed on S1 Fitting

Sandwich Valve 10" 600

Upstream Stopple Machine

6" Valve for crude filling and pig driving

6" temporary line for new line portion filling

16" End cap removed

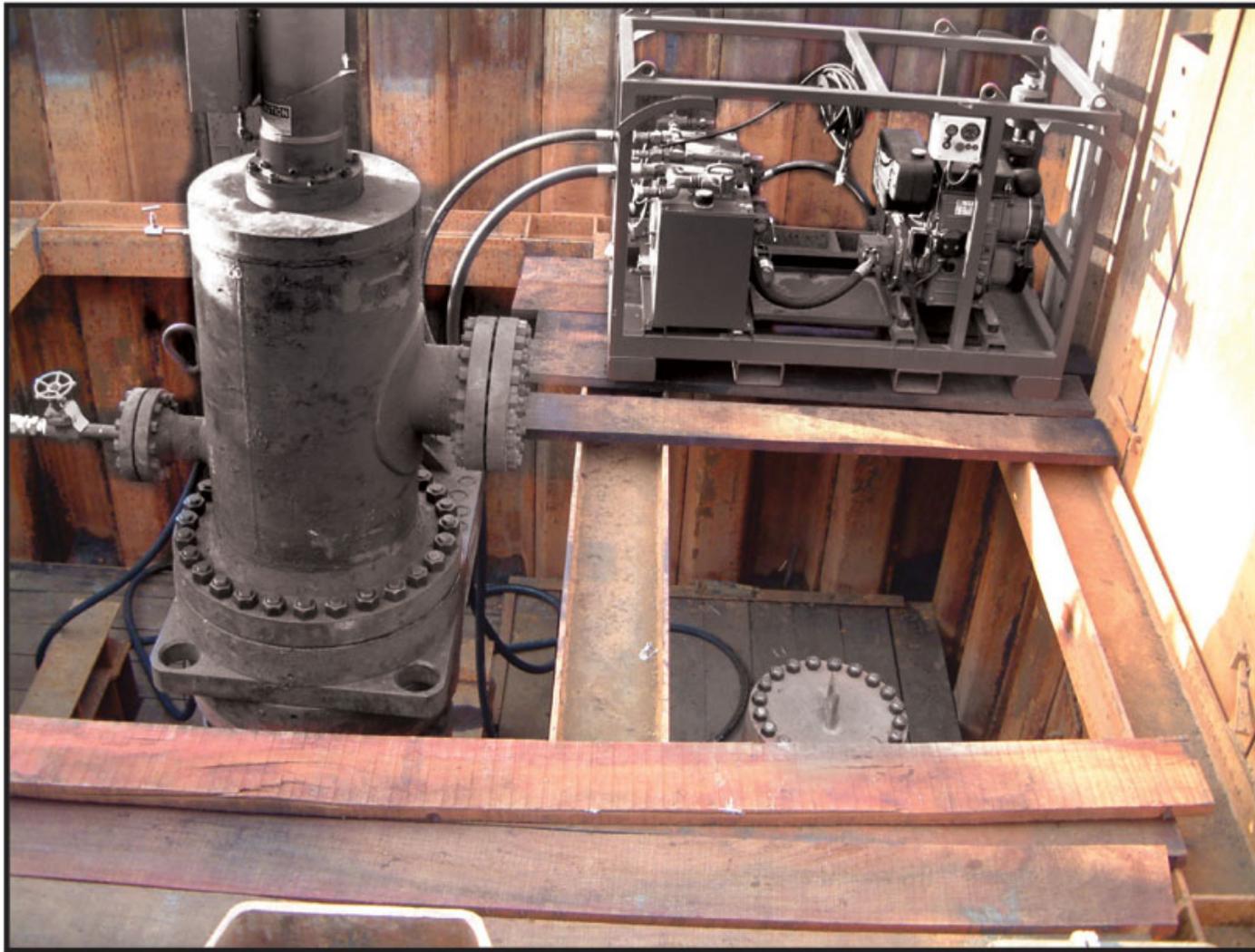
Gas bag

10" TEMPORARY BYPASS to be connected on 10" 600 Sandwich Valves after Hot Tapping

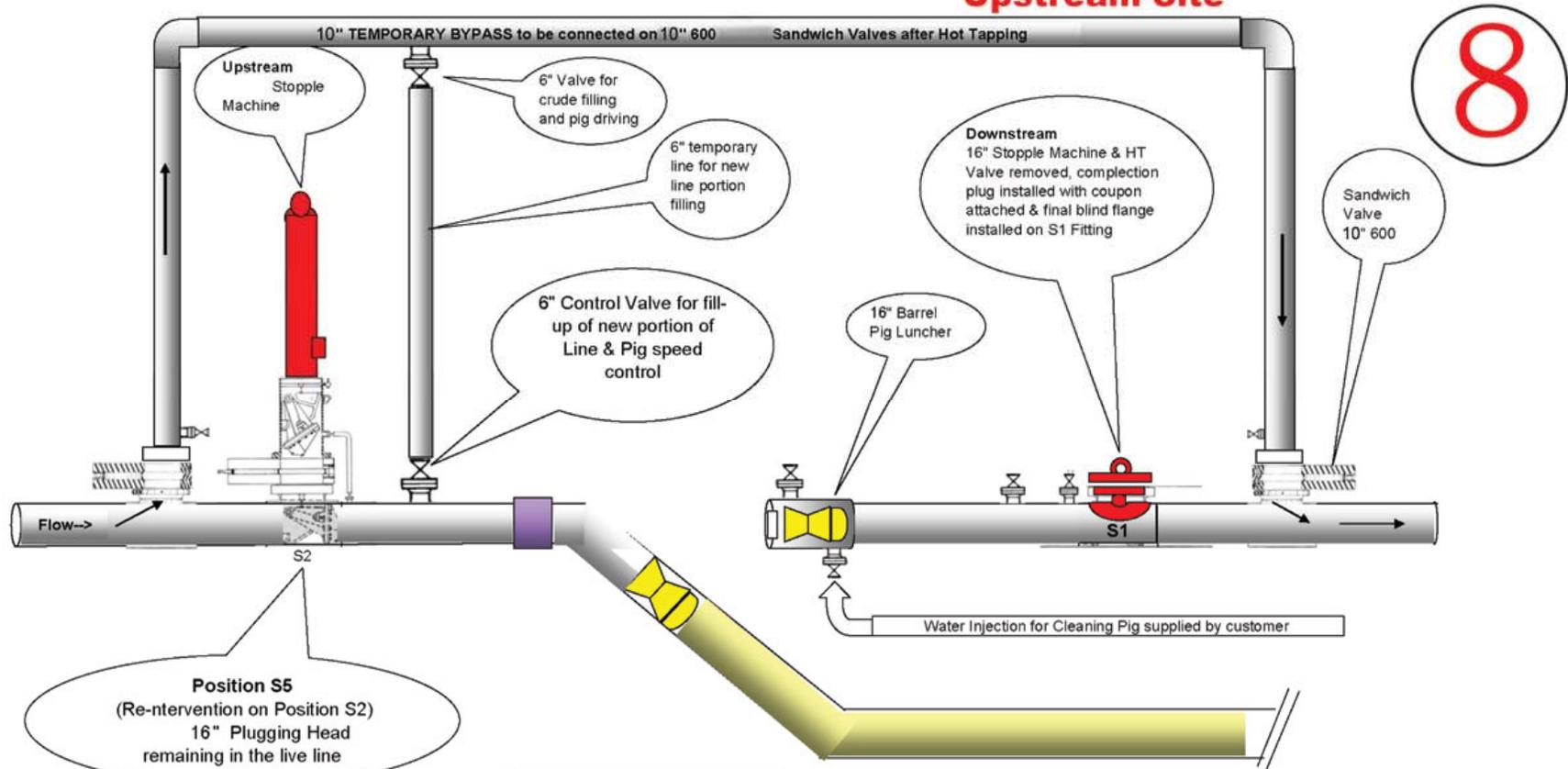
Flow-->

S2

S1

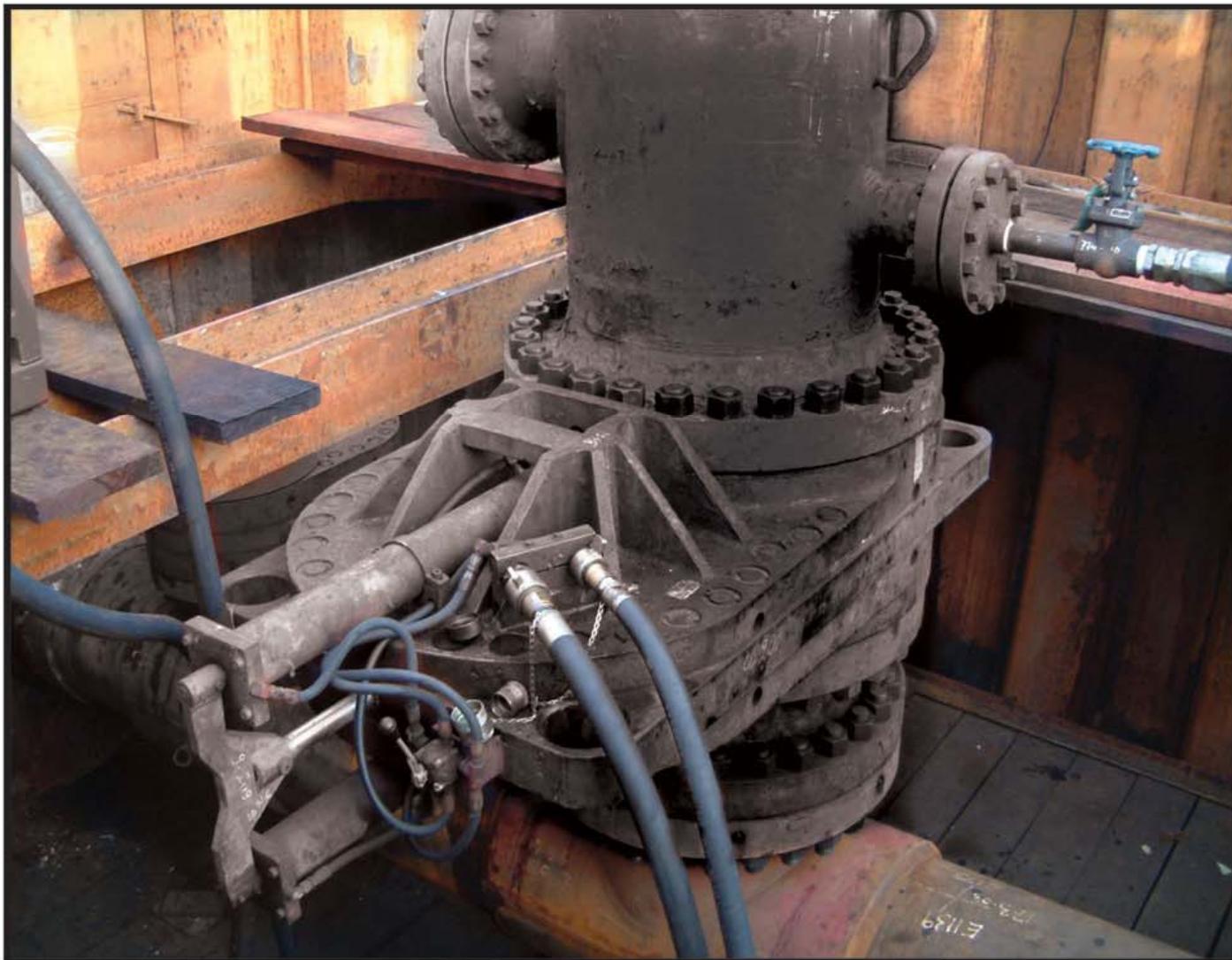


Filling New Line Step # 8 Upstream Site



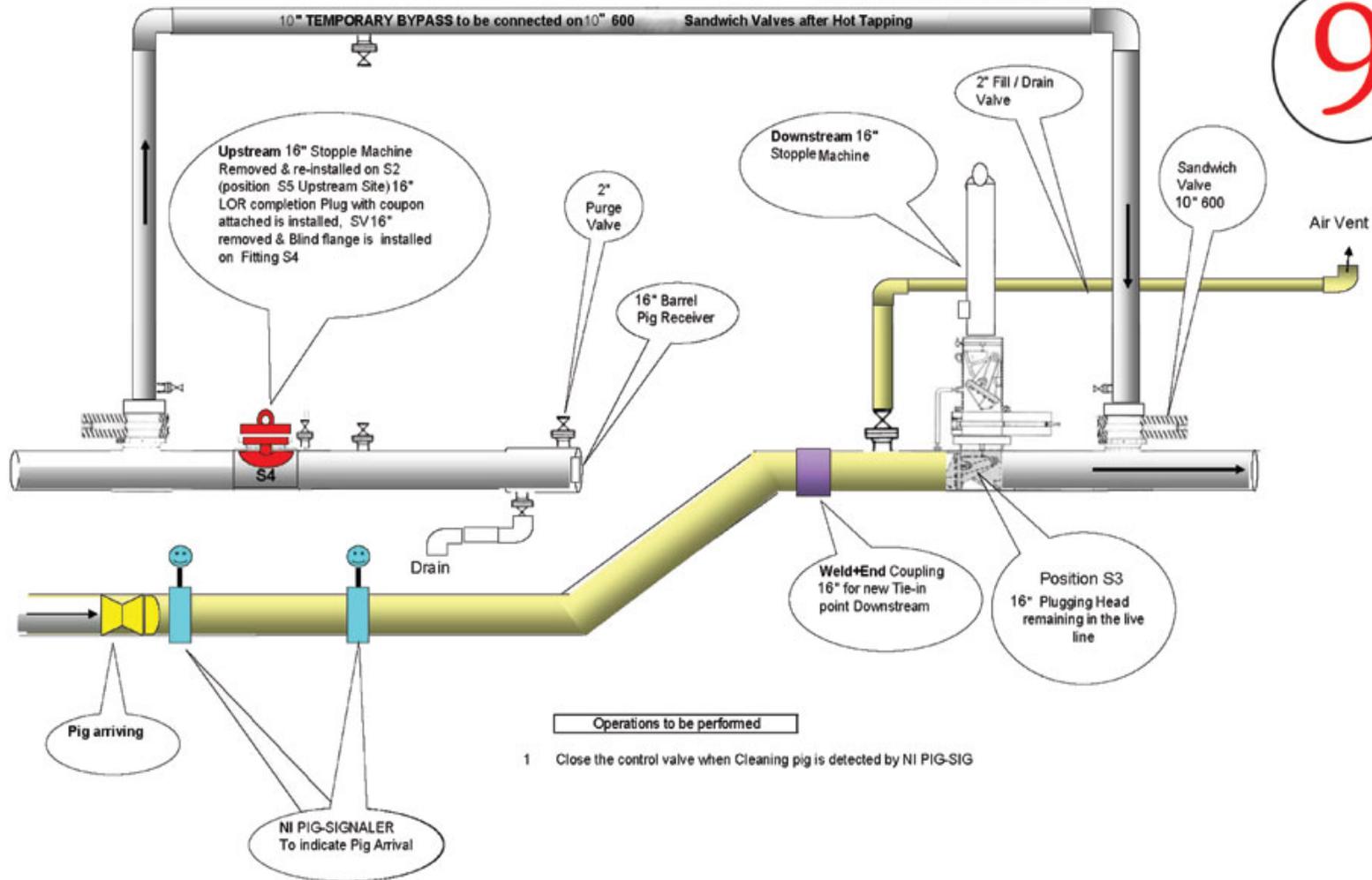
Operations to be performed

- 1 Open gradually the 6" control valve to fill the new line with crude oil
- 2 Open the bleeder valve downstream to bleed out Air from the new line
- 3 Control the speed of the Cleaning Pig into the line

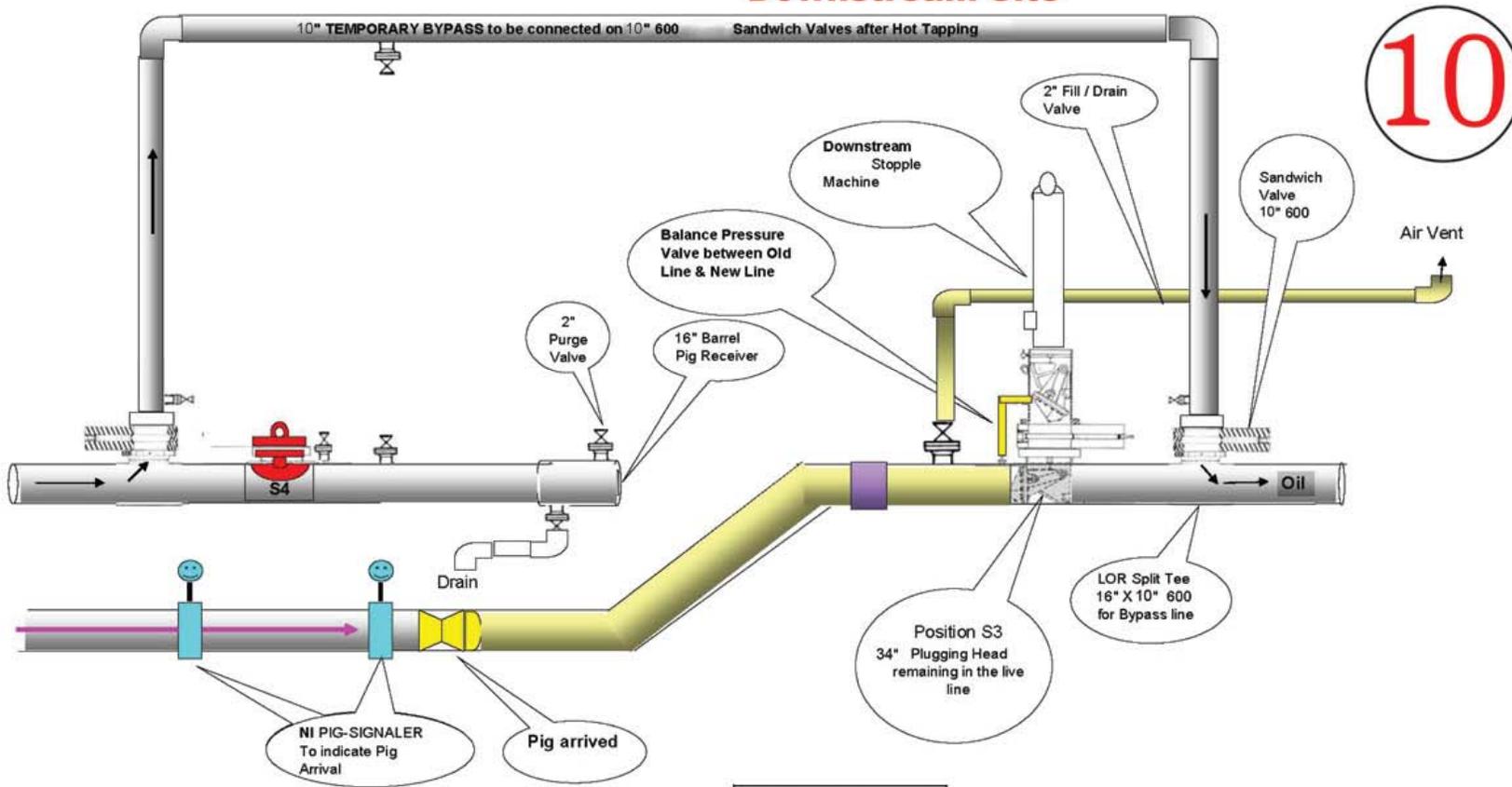


Pig Reception Step # 9 Downstream Site

9



Balancing the Pressure Step # 10 Downstream Site

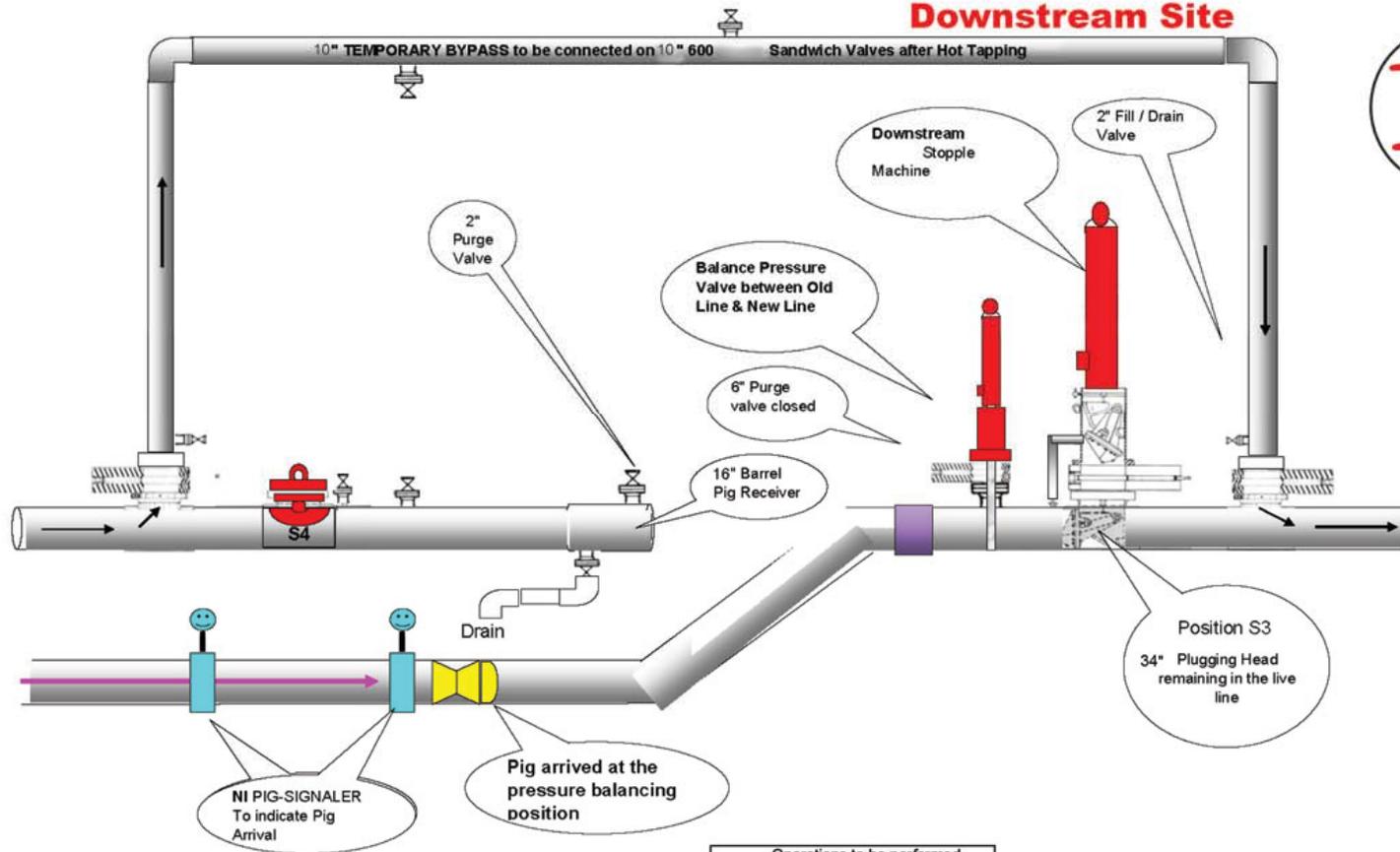


Operations to be performed

- 1 Position the cleaning pig after the second NI PIG-SIG

**Pressure Balanced
Step # 11
Downstream Site**

11

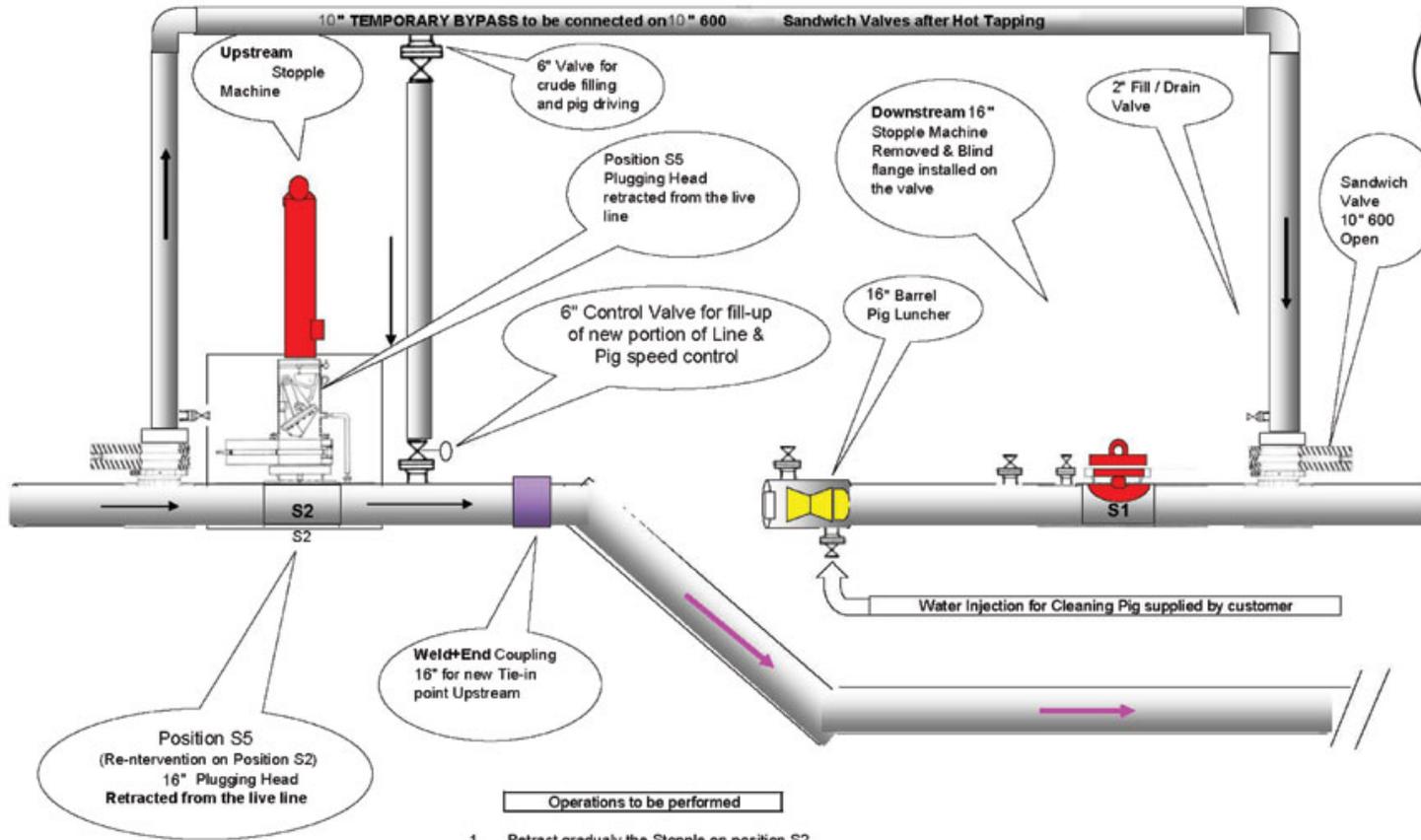


Operations to be performed

- 1 Balance the pressure in the new line
- 2 Install The TDW's Actuator cylinder on 6" SV to hold the Cleaning Pig

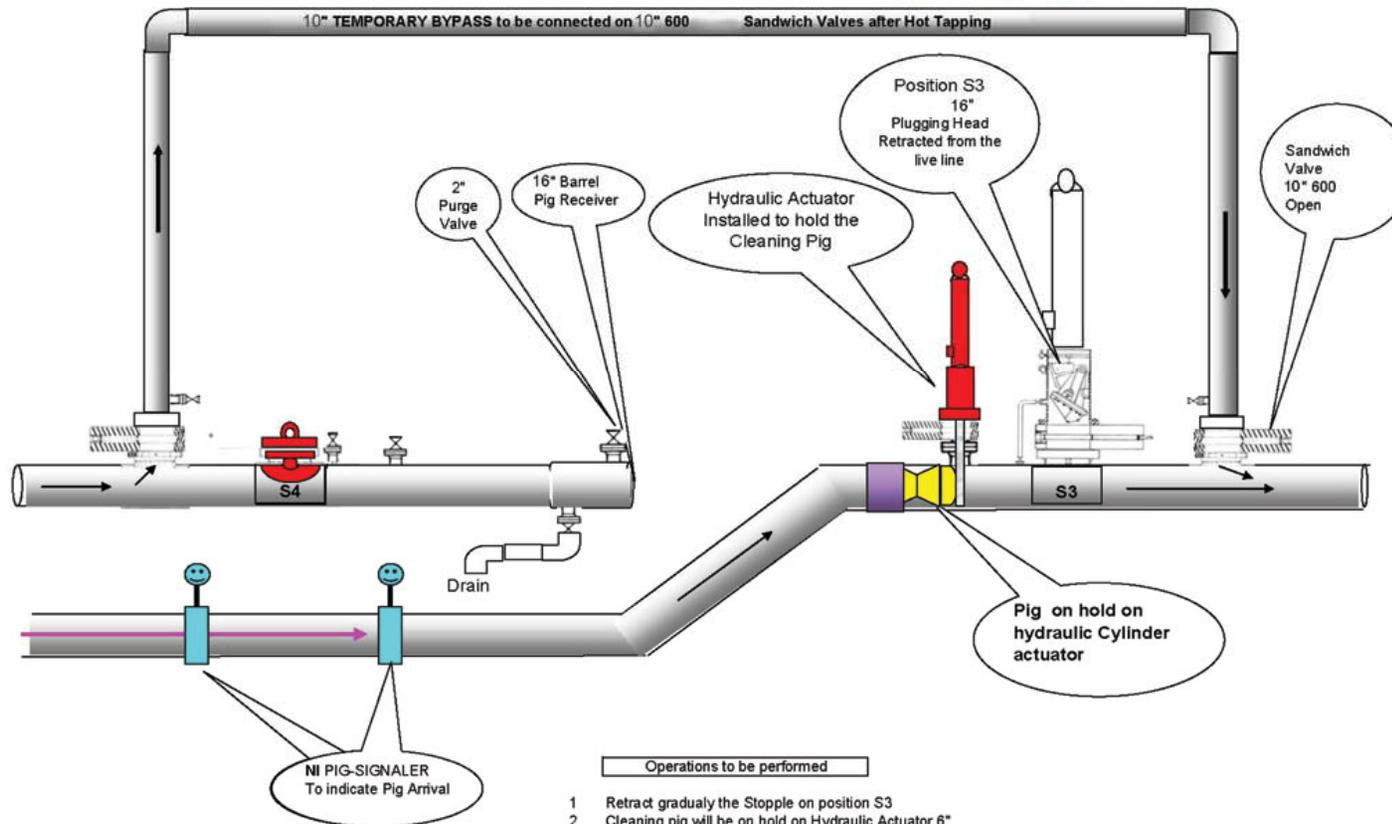
**S5 Retracted
Step # 12
Downstream Site**

12



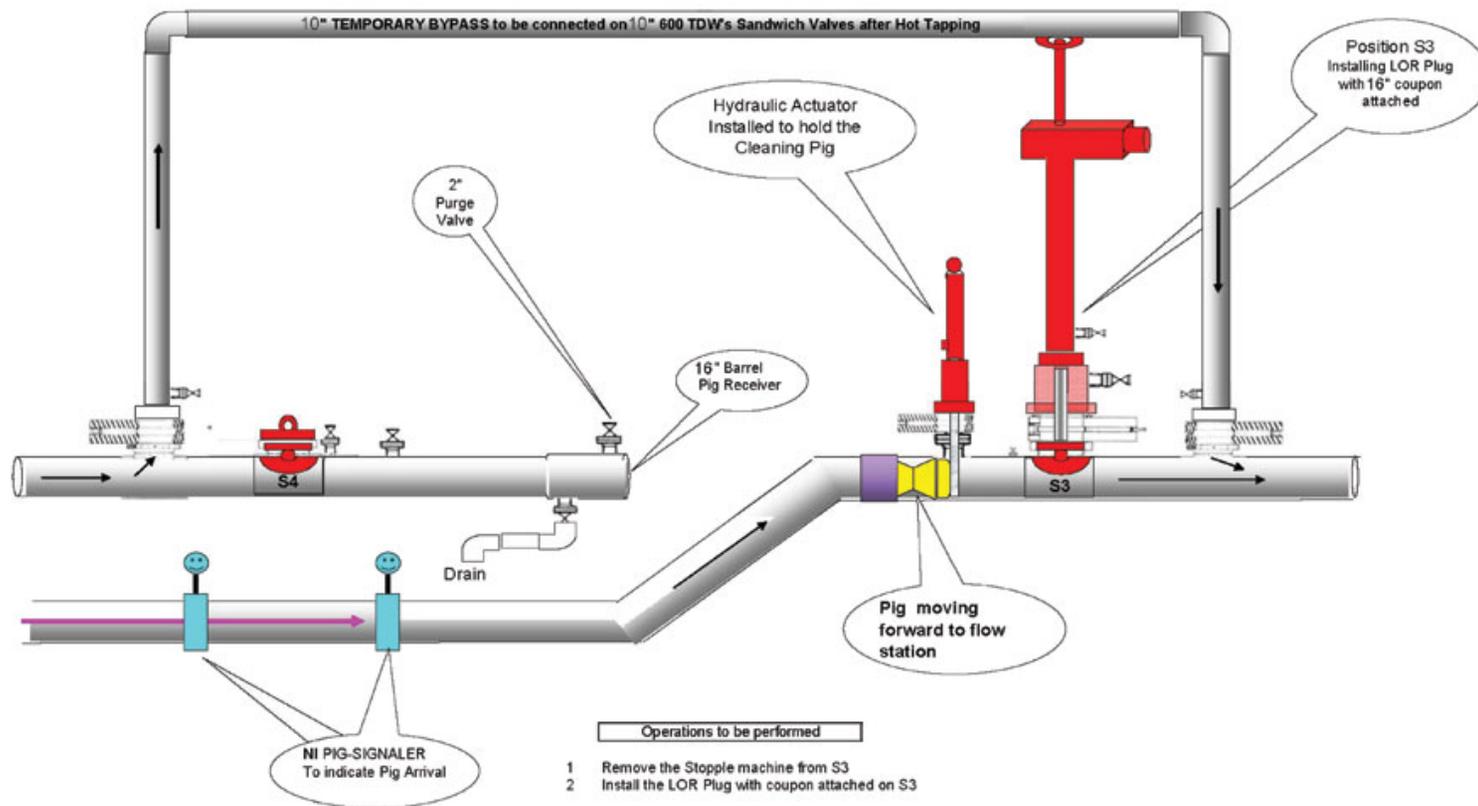
S3 Retracted
Step # 13
Downstream Site

13

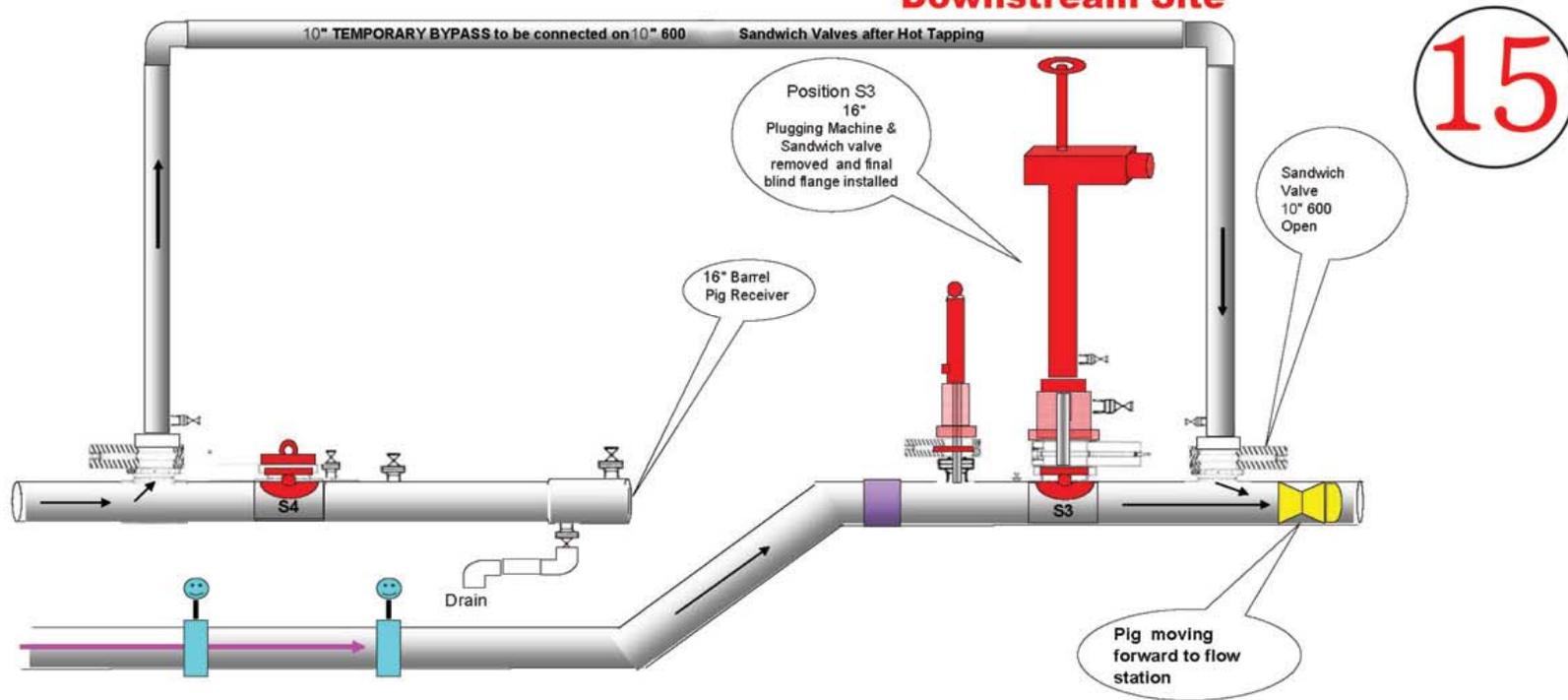


LOR Plug on S3
Step # 14
Downstream Site

14



Releasing the Pig Step # 15 Downstream Site

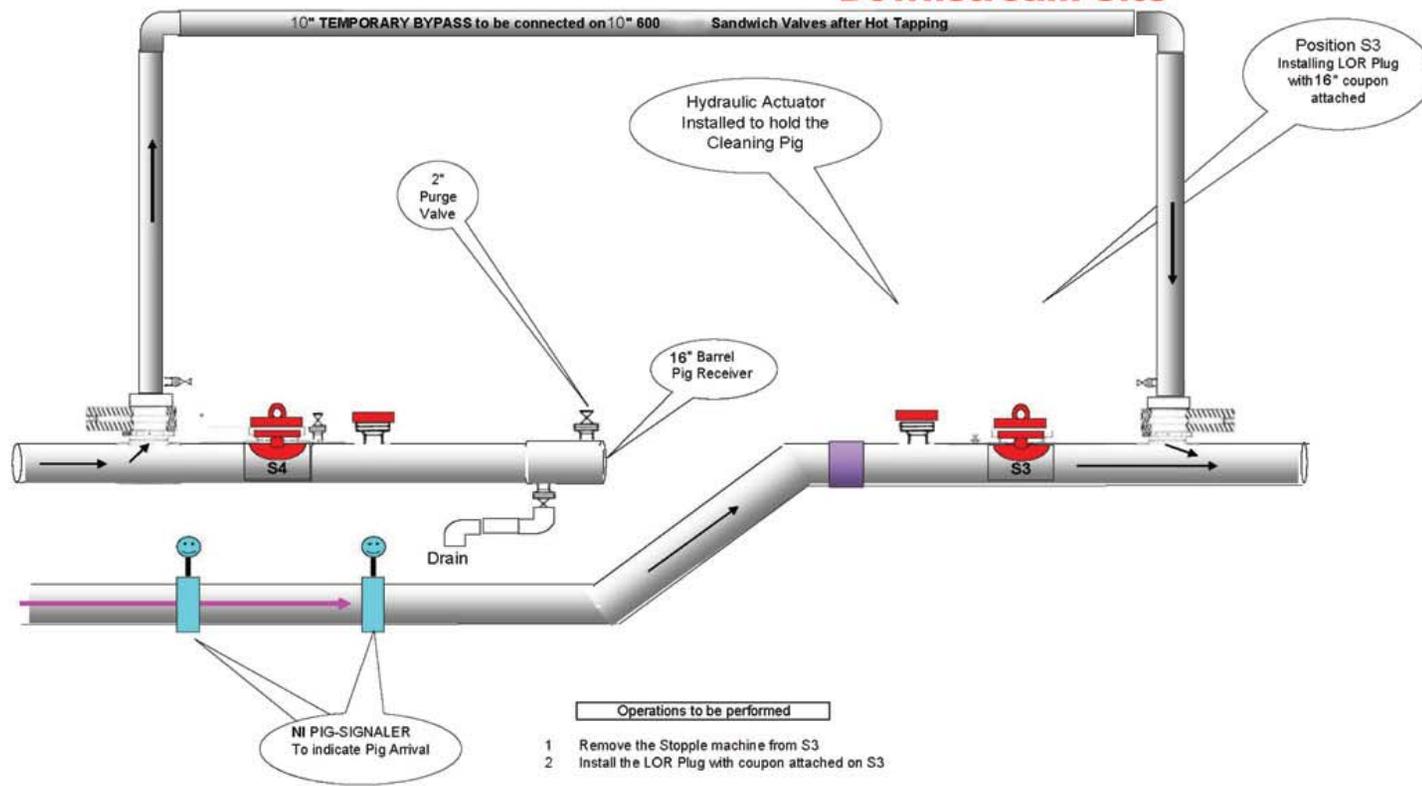


Operations to be performed

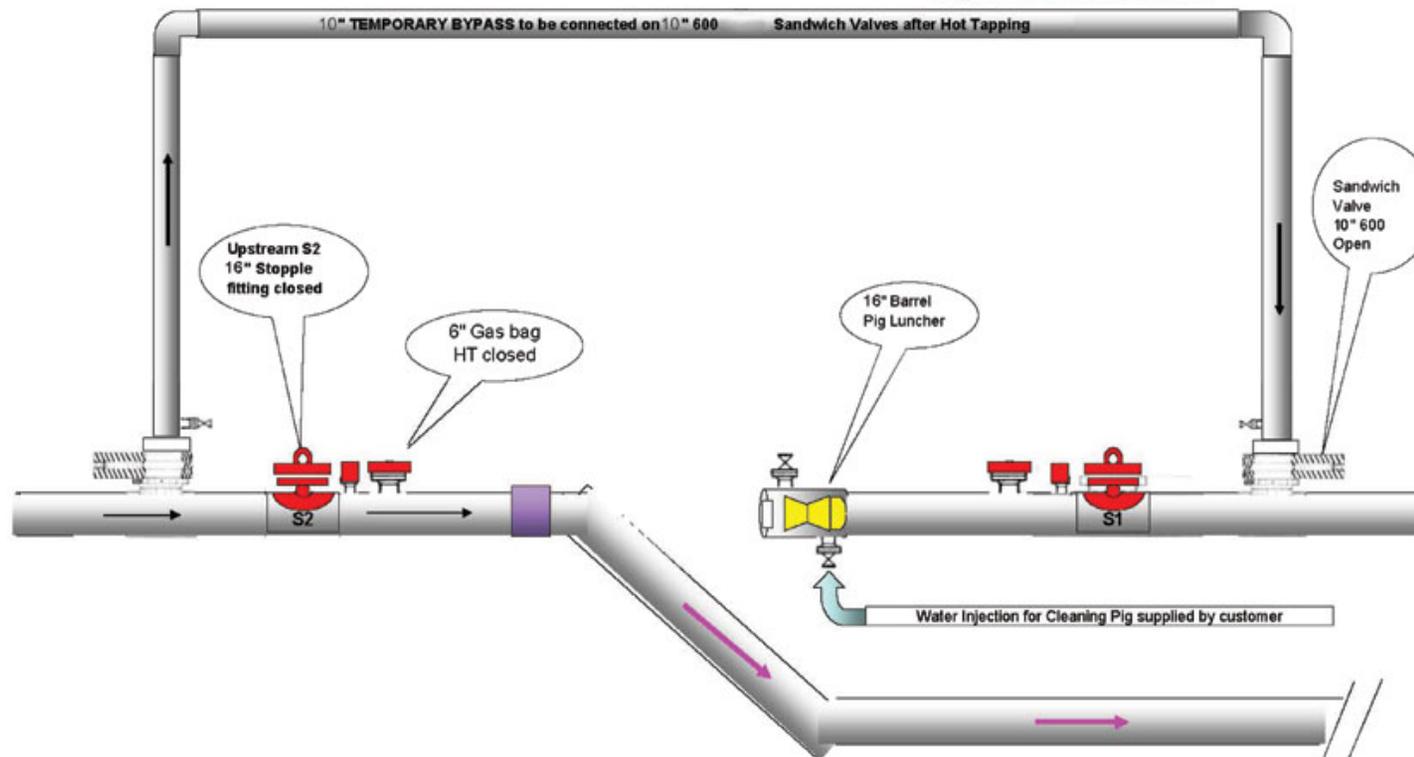
- 1 Retract the Hydraulic Actuator to Release the cleaning Pig

Closing S3
Step # 16
Downstream Site

16



Closing S5
Step # 17
Upstream Site

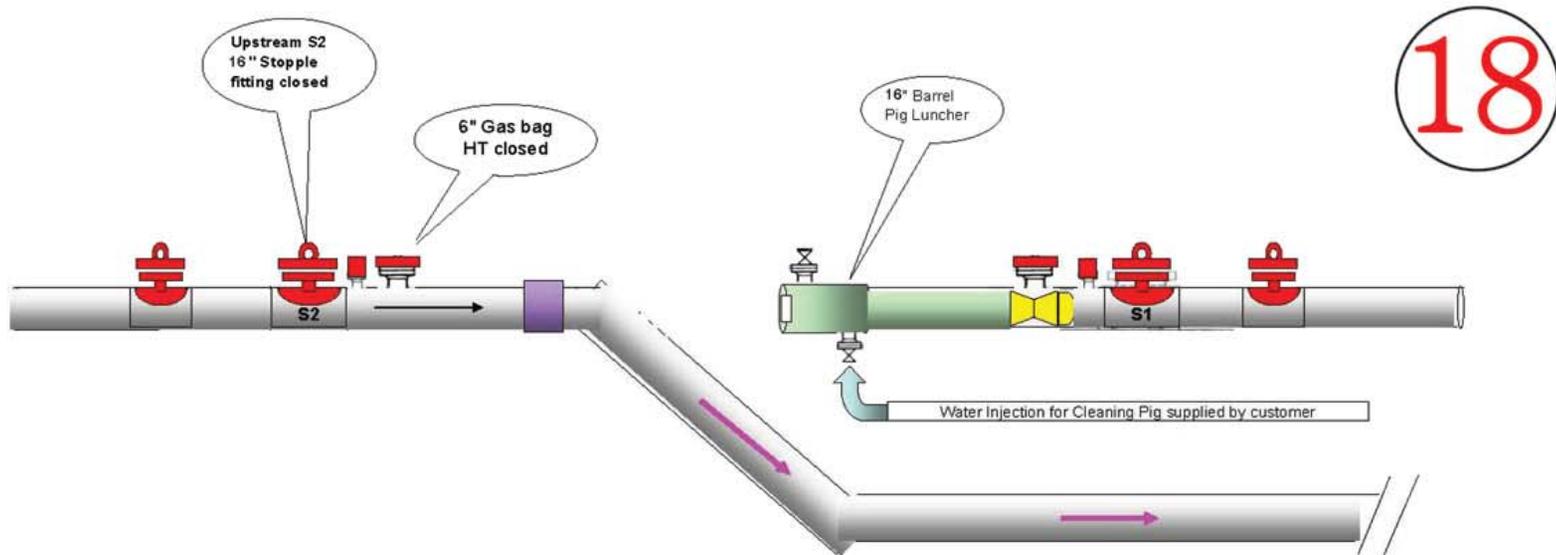


17

Operations to be performed

- 1 Removing stopple Machine on S2
- 2 Installing LOR Plug with coupon attached
- 3 Removing 34" Tapping Valve from S2
- 4 Installing 34" Blind flange on S2
- 5 Installing 2" TOR Plug on S2 Drain Fitting
- 6 Installing 6" Blind flange on S2 Gas Bag fitting

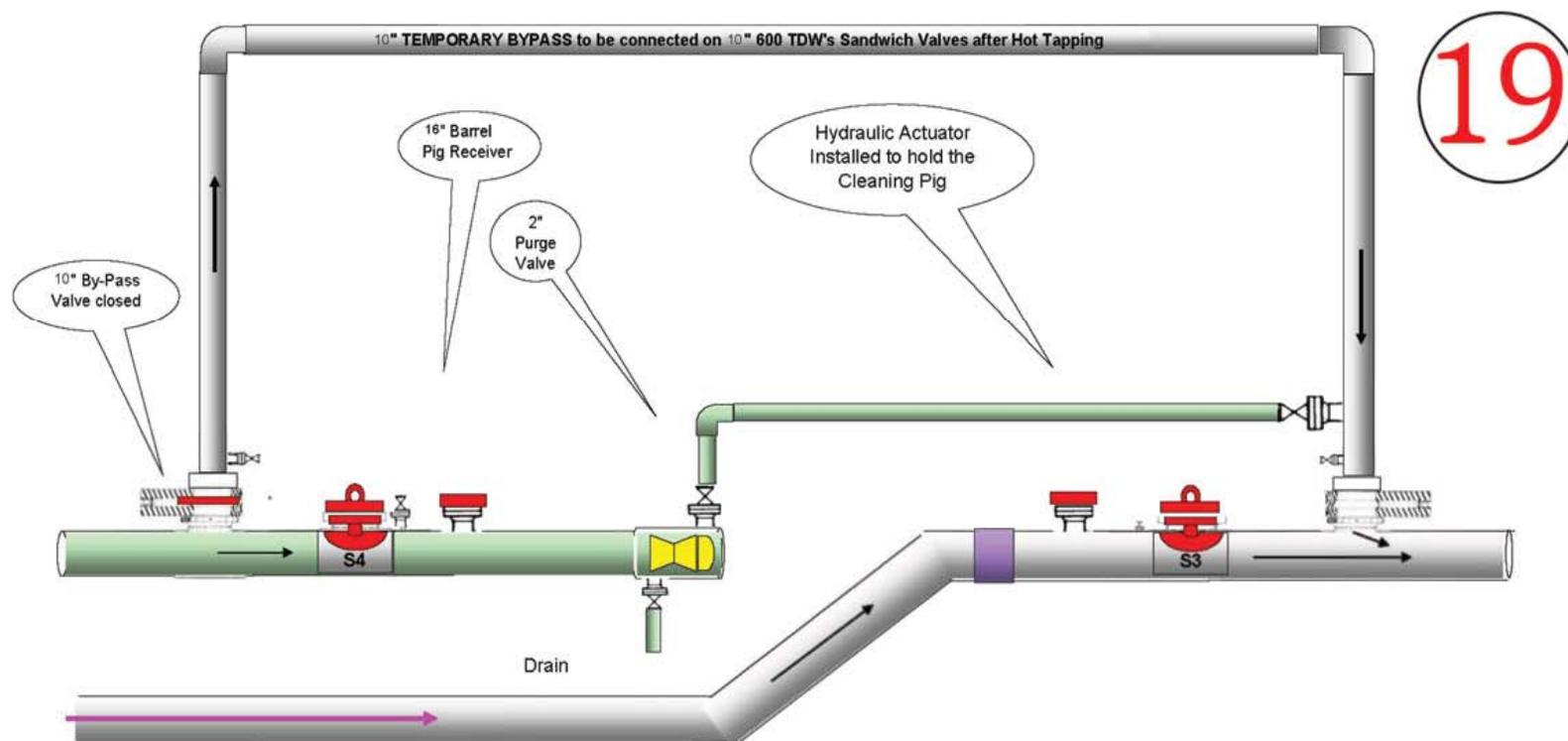
Removing upstream By-pass Step # 18 Upstream Site



Operations to be performed

- 1 Removing 10" By-pass Line Upstream
- 2 Installing LOR Plug with coupon attached
- 3 Removing 10" By-pass valves from the 16" Fitting
- 4 Installing 16" Blind flange on the 2 By-pass fittings 10"
- 5 Inject water in the Pig launcher barrel to send the cleaning pig in the old line

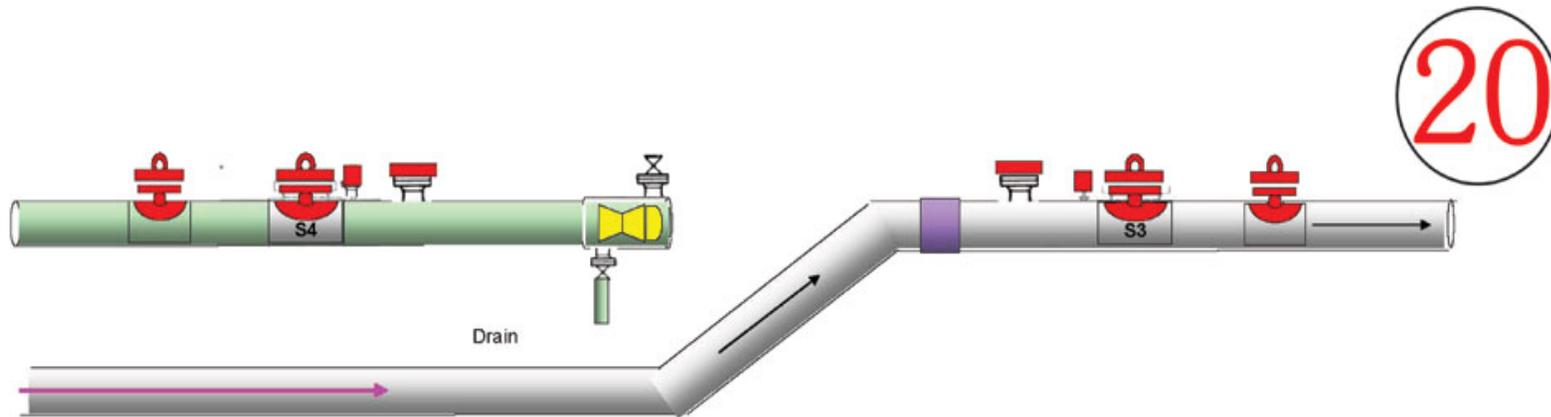
Draining the old line
Step # 19
Upstream Site



Operations to be performed

- 1 Remove the Stopple machine from S3
- 2 Install the LOR Plug with coupon attached on S3

Removing Downstream Step # 20 Downstream Site



Operations to be performed

- 1 Removing 10" By-pass Line Downstream
- 2 Installing LOR Plug with coupon attached
- 3 Removing 10" By-pass valves from the 10" Fitting
- 4 Installing 10" Blind flange on the 2 By-pass fittings 16"
- 5 Decommission the Old Line