



STATS GROUP
Managing Pressure, Minimising Risk

OVERCOMING PIPELINE ACCESS CONSTRAINTS

***CREATING OR RESTORING SAFE ACCESS TO PIPELINES
FOR PIG LOADING AND REMOVAL OPERATIONS***

Access Constraints



A common access constraint for pipelines is the inability to safely access pipelines via serviceable pig launching and receiving (PLR) facilities.

Lack of access to pipelines results in essential pigging activities being delayed or conducted less frequently than required - or not at all.





Access Constraints – Causes and Consequences

Pipeline /PLR access constraints can

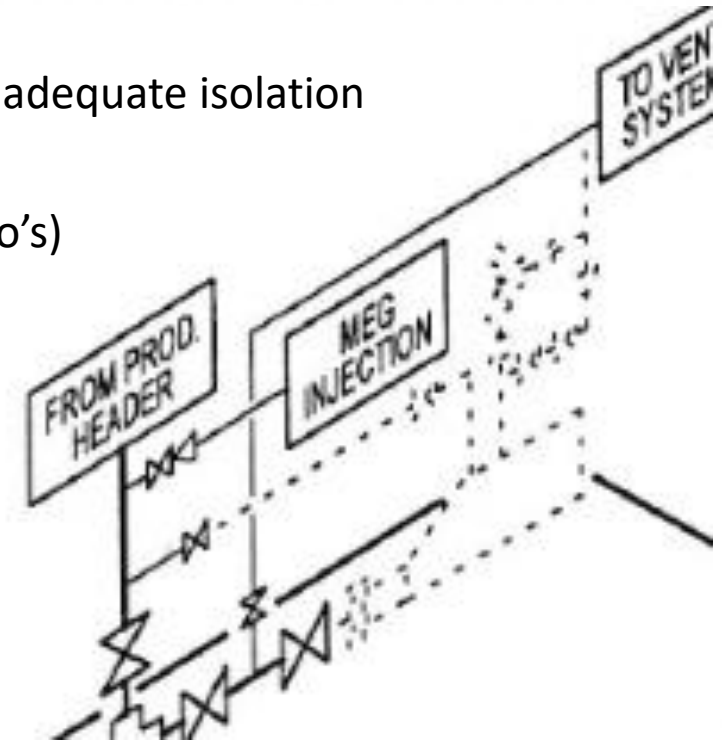
- ❖ Prevent pigging entirely
- ❖ Require production shutdown to install and remove pigs
- ❖ Lead to acceptance of unsafe operations - loading and removing pigs with inadequate isolation

Causes

- ❖ Launchers /receivers (PLRs) not installed (dashed lines on many P&IDs and iso's)
- ❖ The lack of adequate isolation valves for PLR installation
- ❖ Degradation of existing PLR isolation valves (poor valve maintenance)

Consequences

- ❖ Inability to pig the pipeline
- ❖ Essential pigging activities delayed or done less frequently
- ❖ Build up of sand, wax, water or scale
- ❖ Flow assurance challenges, reduced production, corrosion issues
- ❖ Lack of inspection data - increasing integrity risk
- ❖ Exposure to unsafe PLR operations – pressure release or loss of containment safety incident “live gas operations!”

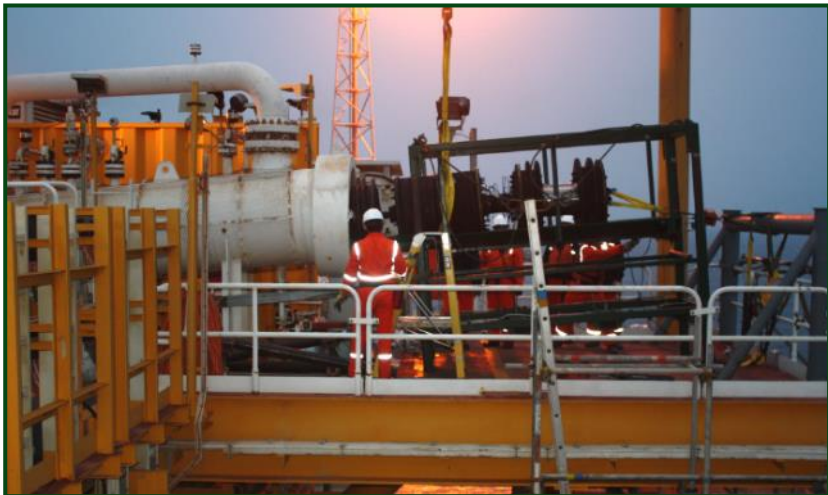


Removing Access Constraints

This presentation will explain how appropriate intervention or isolation methods can be used to create or restore access to pipelines, so pig loading and removal operations can be done regularly and safely.

Restoring or creating safe access typically requires, valve replacement, valve repair or valve installation.

The methods presented show how this can be done; without depressurising the pipeline and often without affecting production.



36" Valve Replacement and Repair – Pipeline Remains Pressurised



Sealant Injection - temporarily restores valve isolation

Temporary Isolation Plugs

- ❖ Double Block and Bleed Inline Isolation Plug (Tecno Plug®)
 - ❖ Umbilical/ Tether controlled
 - ❖ Remote (through wall) controlled

- ❖ Branch Installed DBB Isolation Plug (BISEP®)

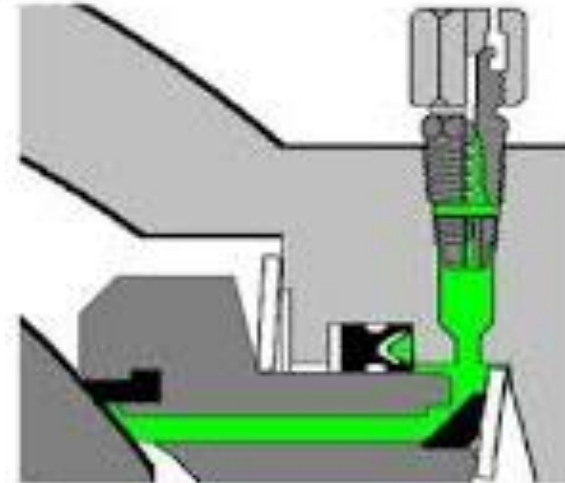
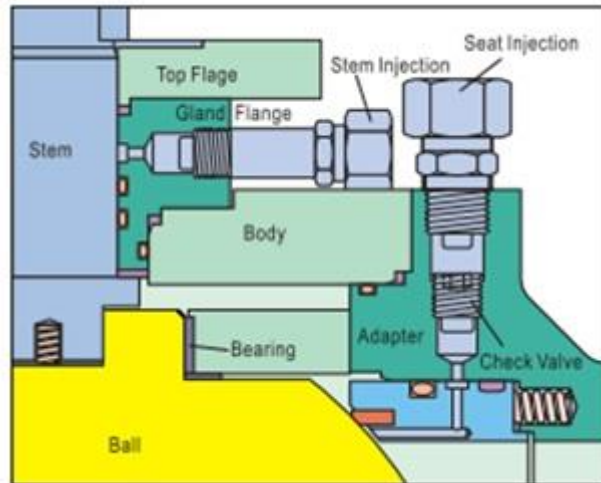
Various Hot Tapping Techniques

- ❖ For sealant injection
- ❖ To facilitate venting and bleeding for isolation valve barrier testing
- ❖ Creating full bore access - for isolation plug installation

Sealant Injection



Injecting sealant into valves can provide sufficient, temporary isolation to enable pig loading and removal



Sealant System Cross Sections

Often the ports required to inject sealant into the correct region of the valves are not available.

Injecting sealant is not a long term fix. The action of injecting sealant grease through sealant injection fittings increases risks of further damage to the valve seats by attracting more debris.

Pressure Controlled Penetration – for Sealant Injection

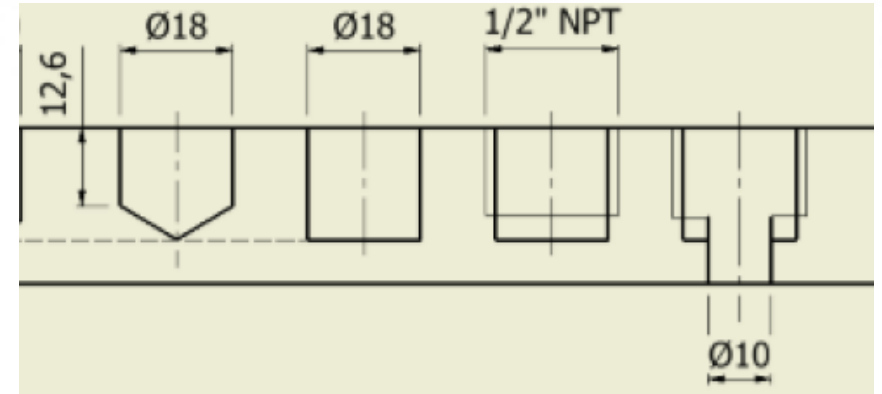


If sealant injection ports are not available, ports can be created by doing a small bore hot tap into the valve body

UT measurement to confirm body thickness and design calculations required.

Stages for safe pressure controlled penetration

1. Drill initial hole to specified depth
2. Drill wider hole
3. Tap hole
4. Fit small bore hot tap machine – leak test all connections
5. Drill through final section of valve body



This method can also be used for venting and bleeding between two barriers



Stage 1



Stage 2



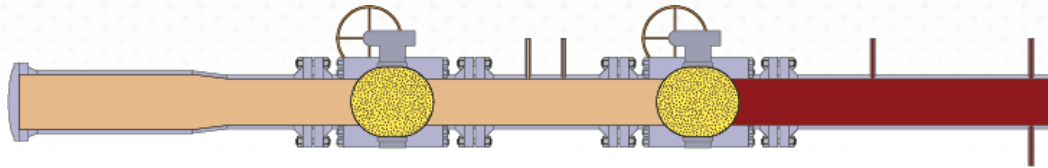
Stage 3



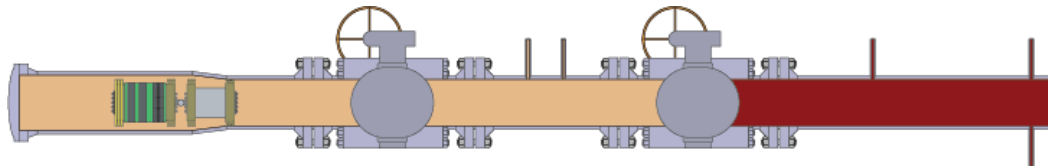
Stage 4 & 5



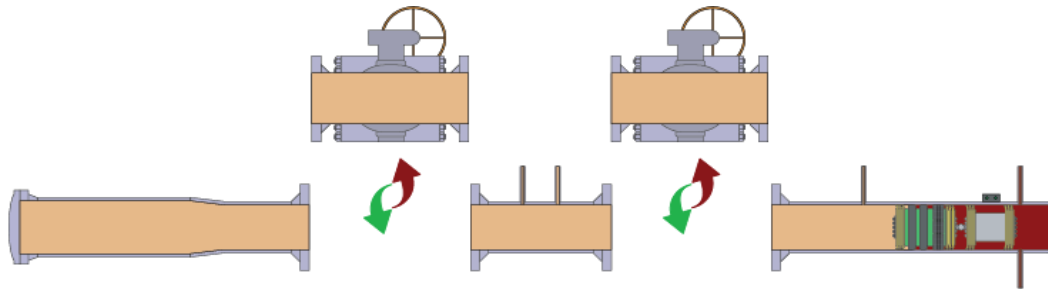
Inline Isolation Plug – Valve Replacement



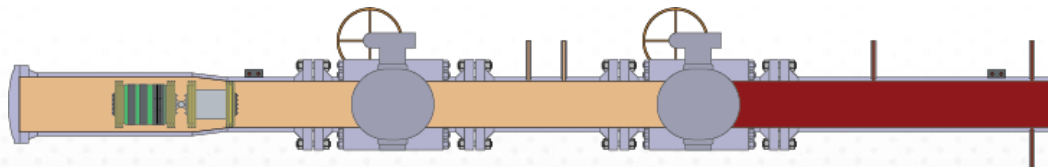
Once the valves are sealing, it is safe to open the launcher door



Isolation plug is then loaded into the PLR



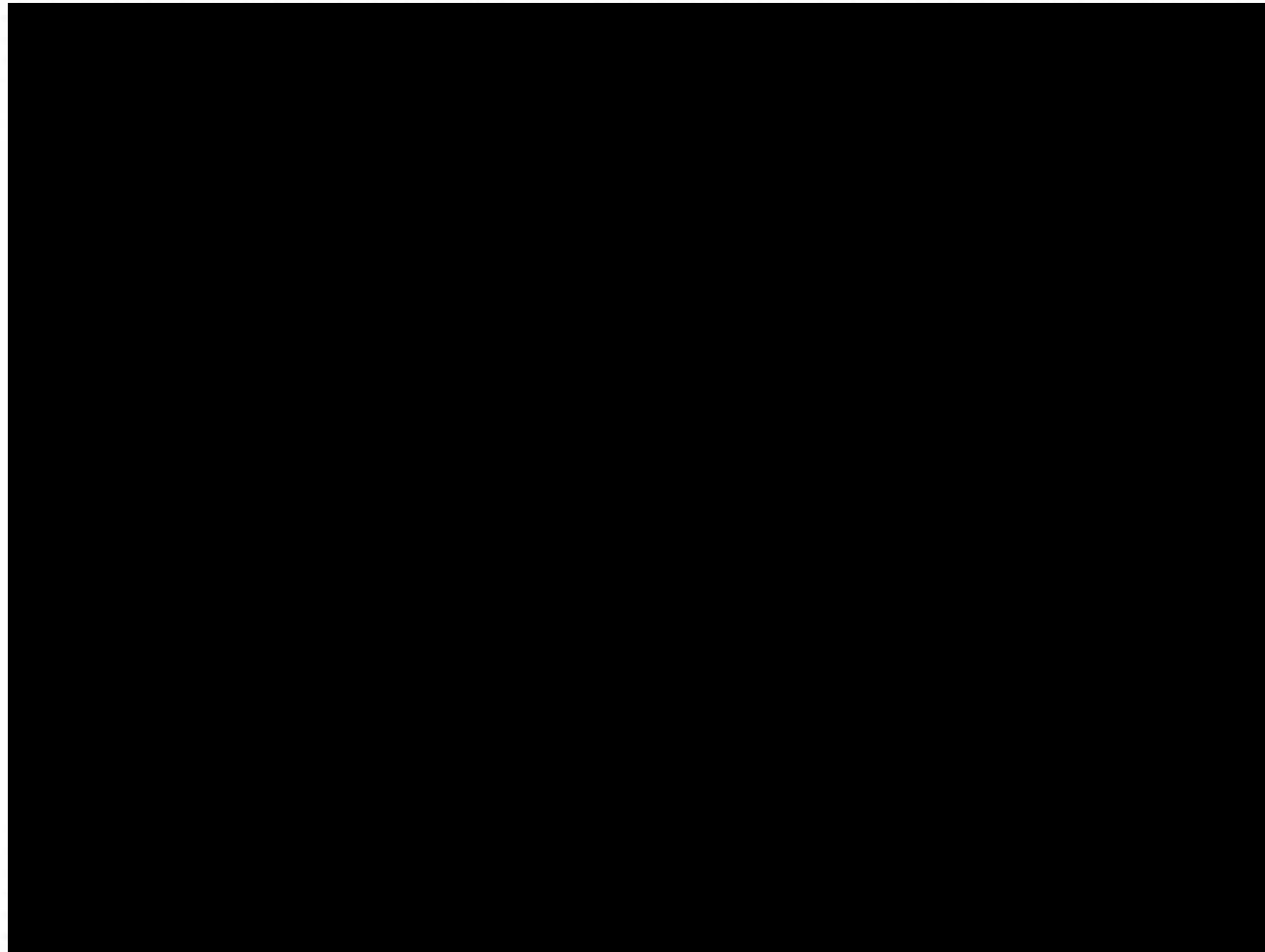
Isolation Plug deployed and Double Block Isolation proved
Damaged valves removed
New valves installed
All new or disturbed flange connections leak tested



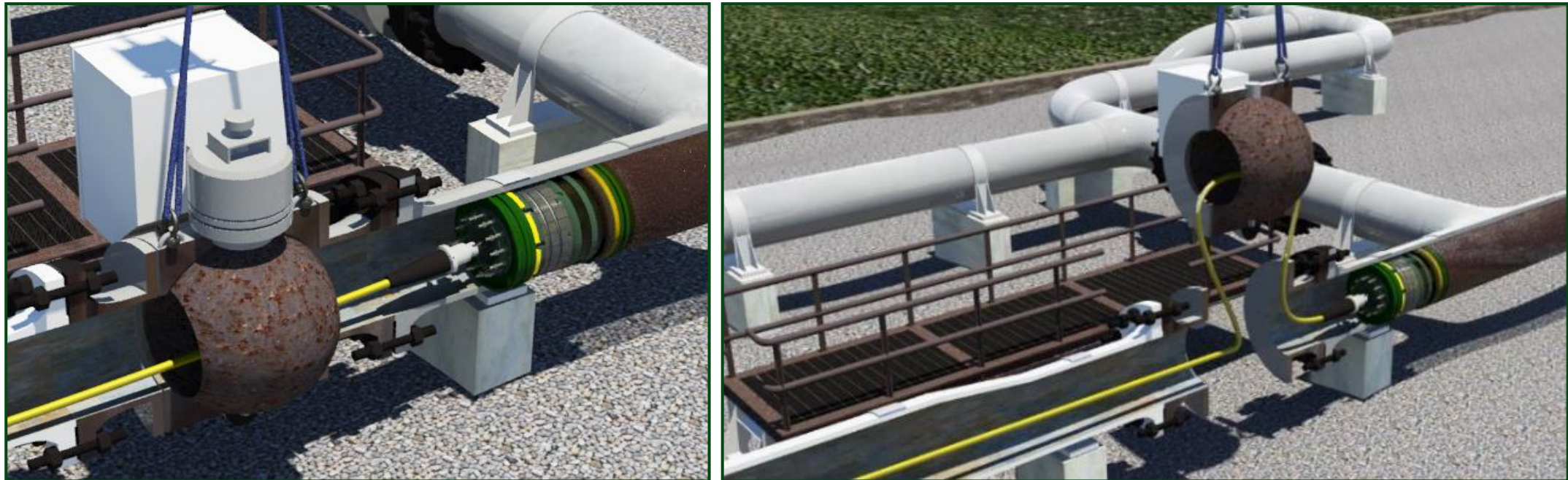
Isolation Plug Unset and recovered
New valves isolating PLR

**Valve Replacement
Using a Remote controlled DBB Tecno Plug**

Remote Tecno Plug Valve Replacement Animation



Inline Isolation Plug – Valve In-Situ Repair

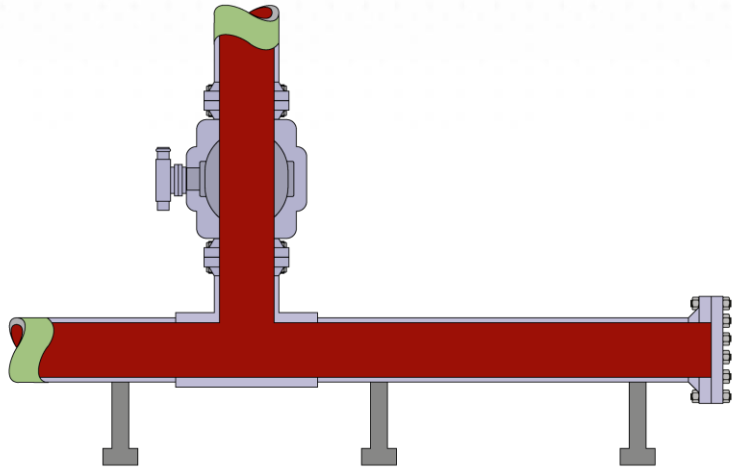


In-Situ Repair Using a Tethered DBB Tecno Plug

Production Unaffected



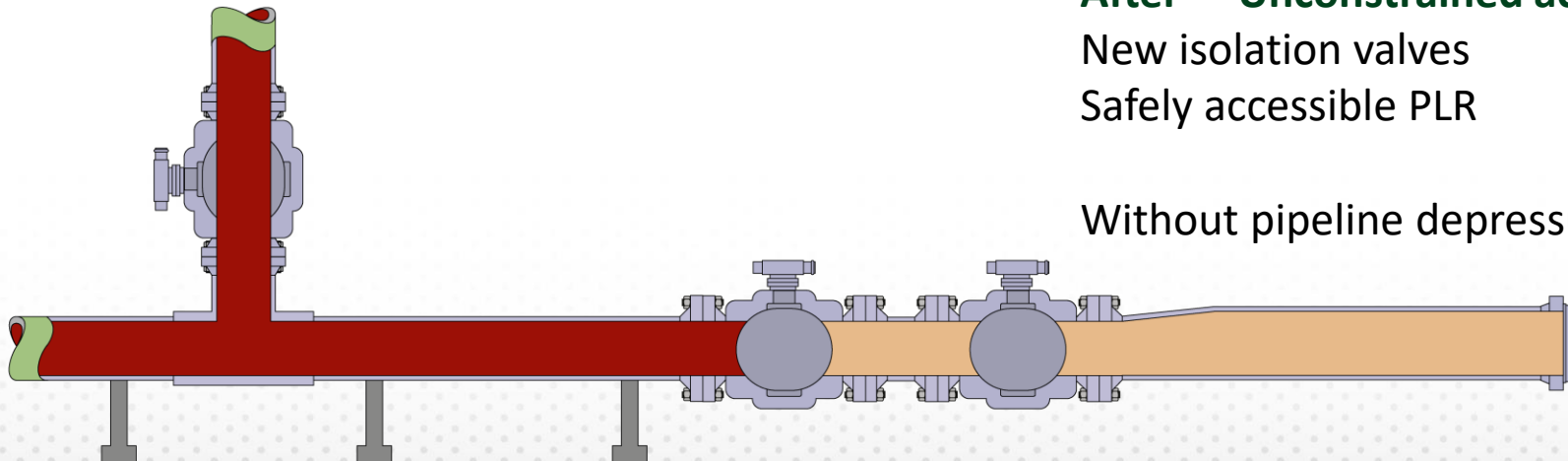
Constraint: No Valves - Just a Blind



Before - Constrained access

No isolation valves or PLR

Just a blind flange – dotted *future* install, never done.



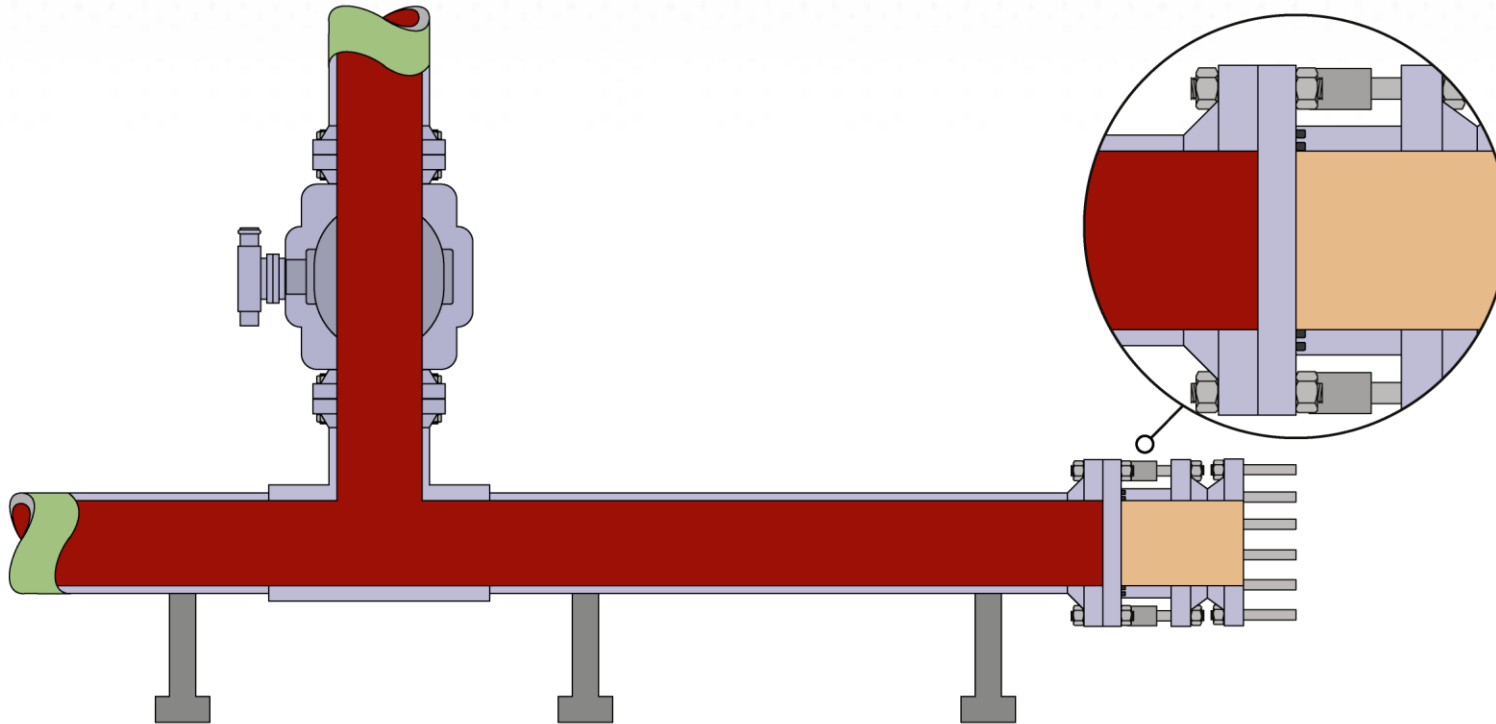
After - Unconstrained access

New isolation valves

Safely accessible PLR

Without pipeline depressurisation or stopping production

Dual Seal Blind Flange Adaptor



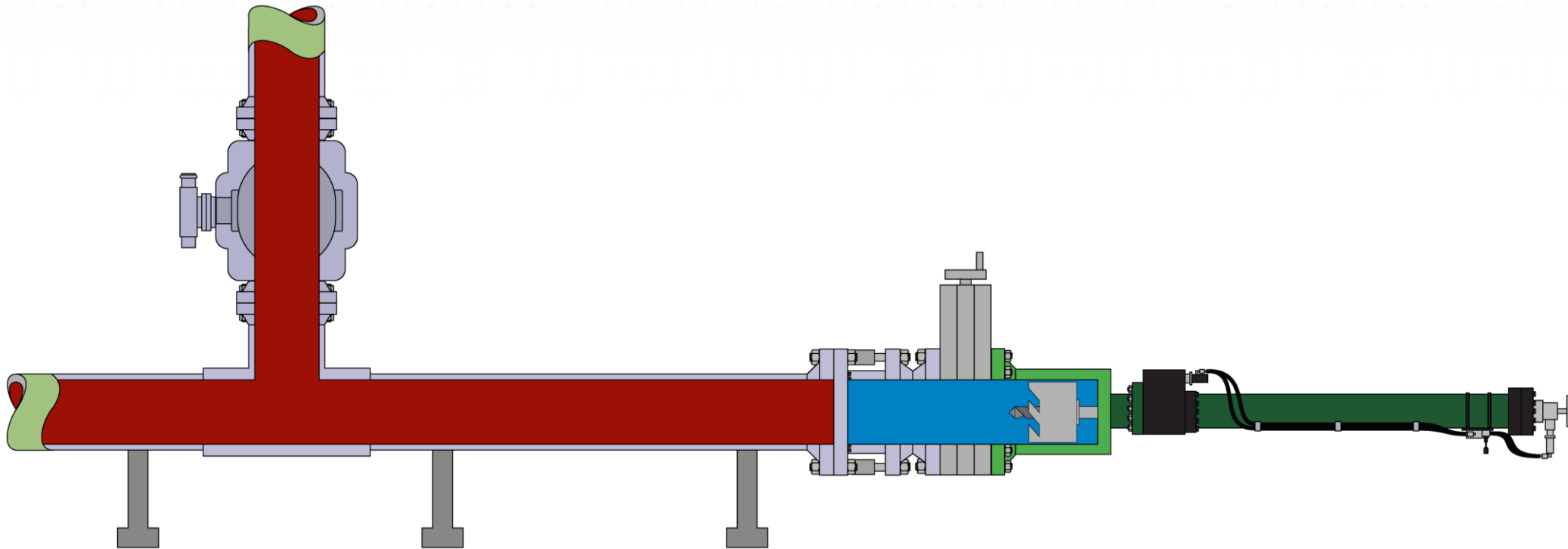
Install dual sealed flange adaptor on to blind flange

May need to hot bolt to replace studs with longer ones or add additional studding with barrel nuts

Use test port to test face seals

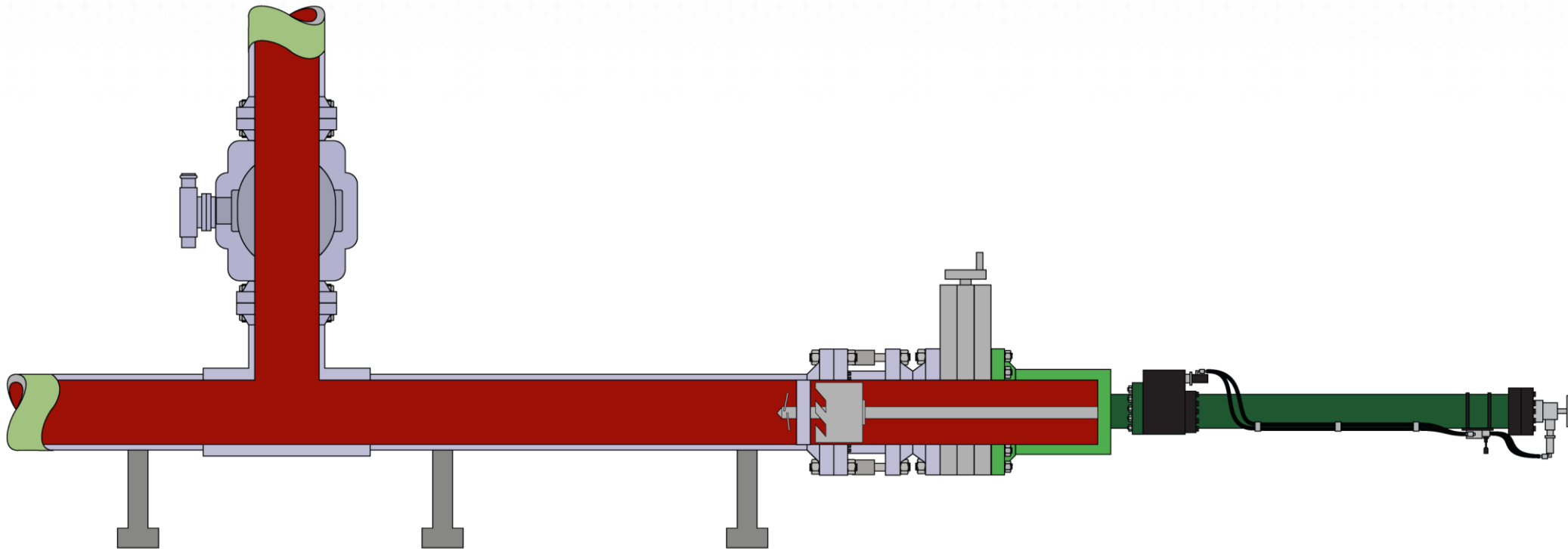
Proving the outer seal at 1.1x design pressure in the correct direction

Hot Tap Assembly



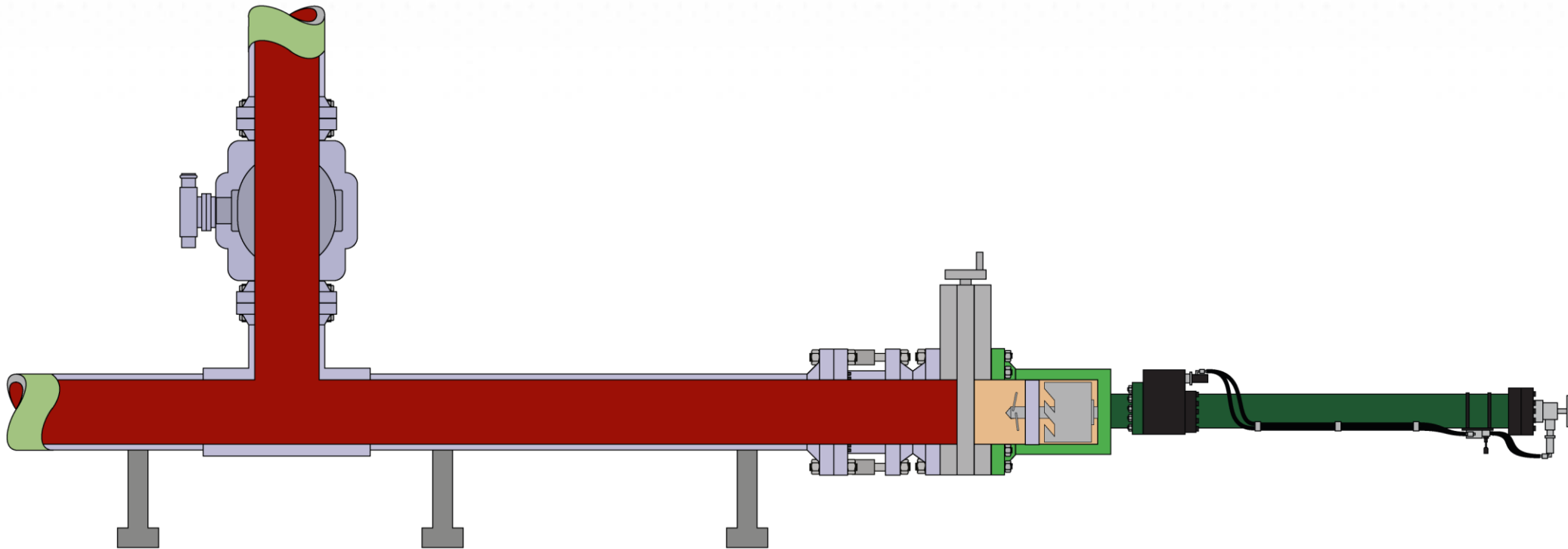
Fit Hot tapping valve and hot tap machine
Leak test assembly

Blind Trepanned



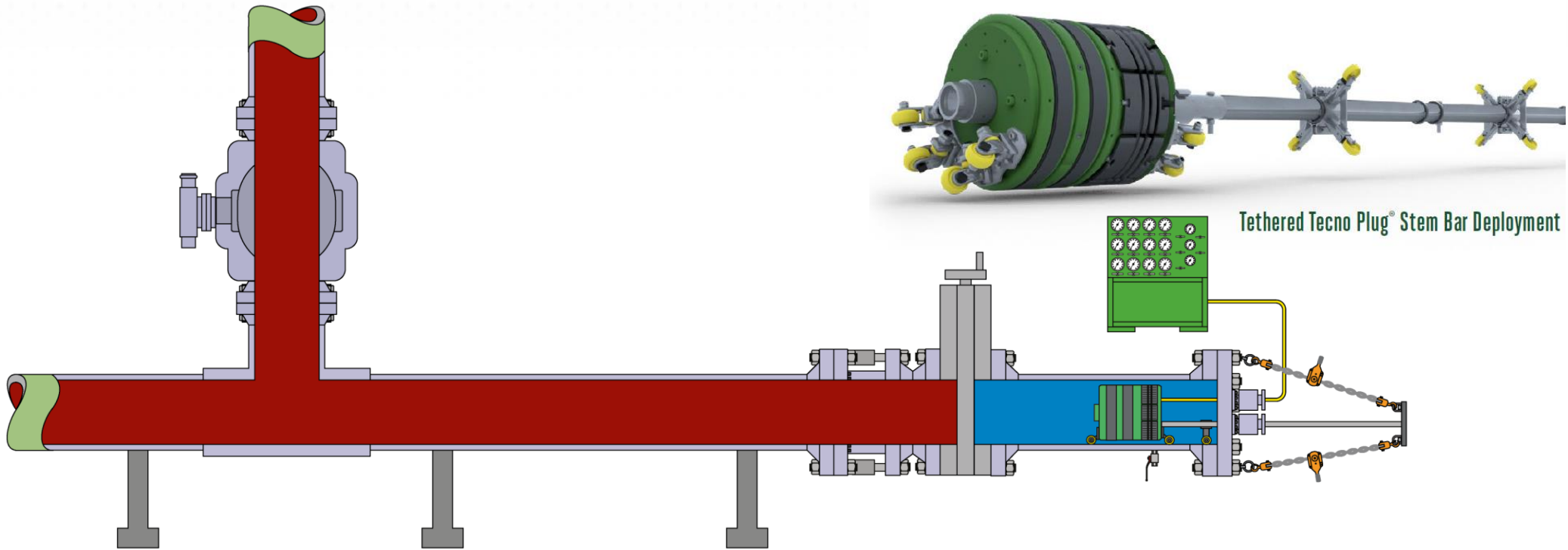
Perform hot tap through blind flange
The cutter is specially designed for trepanning through the blind

Coupon Recovered



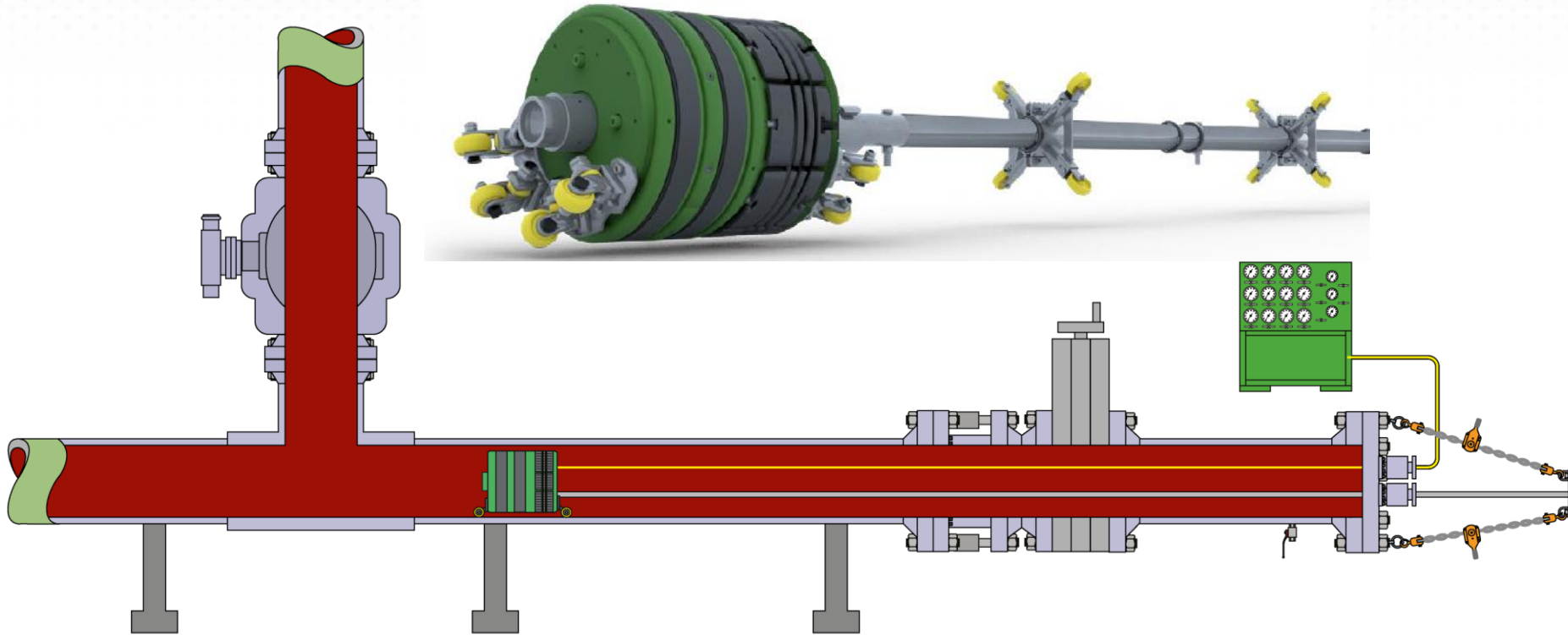
Retract hot tap cutter - and cut out coupon
Close hot tapping valve, Perform DBB valve isolation tests
Flush and purge hot tap machine, Remove hot tap machine

Temporary Launcher with Isolation Plug



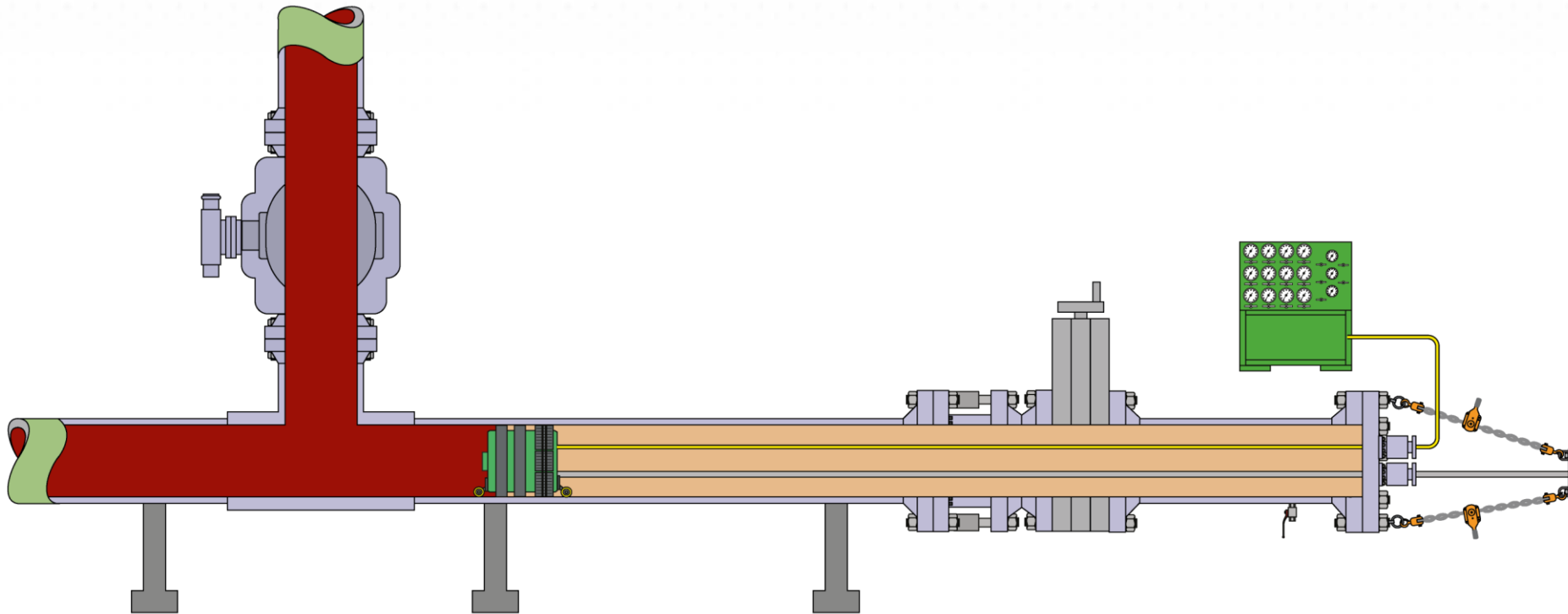
Fit Temporary launcher with Tethered Tecno Plug
Leak test joints

Isolation Plug Deployed



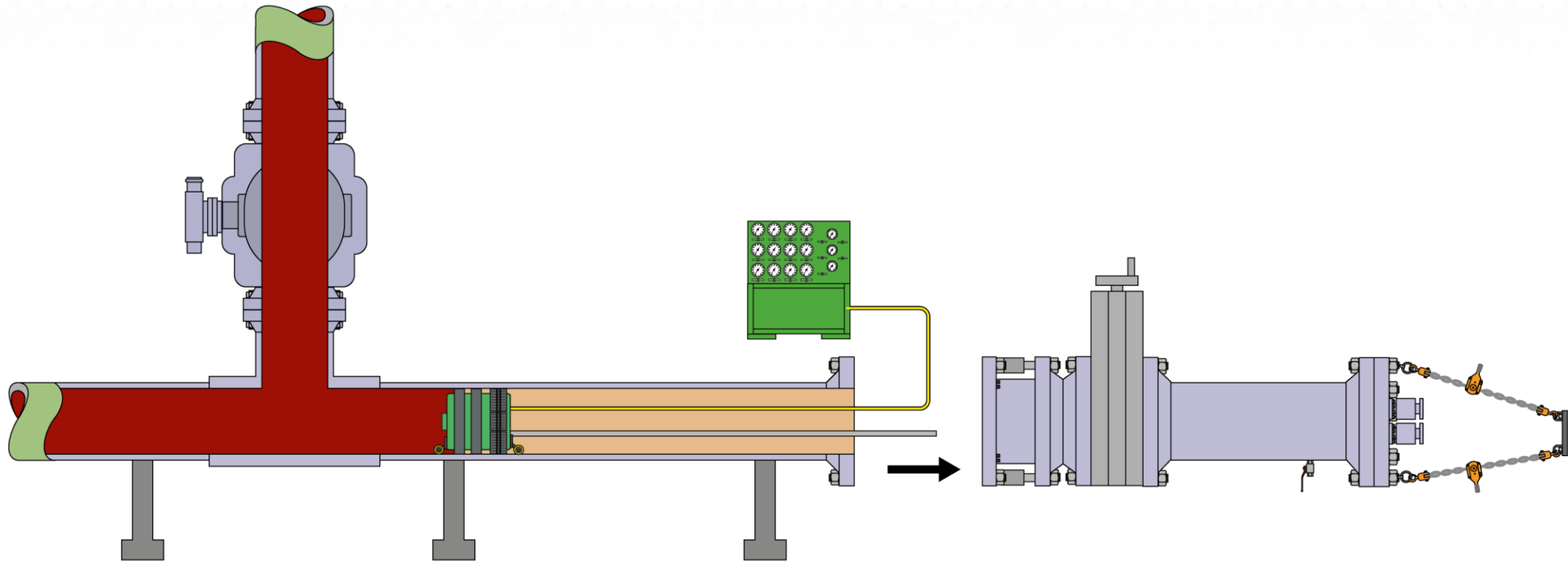
Open slab valve
Deploy TTP to isolation location

Double Block and Bleed Isolation Proved



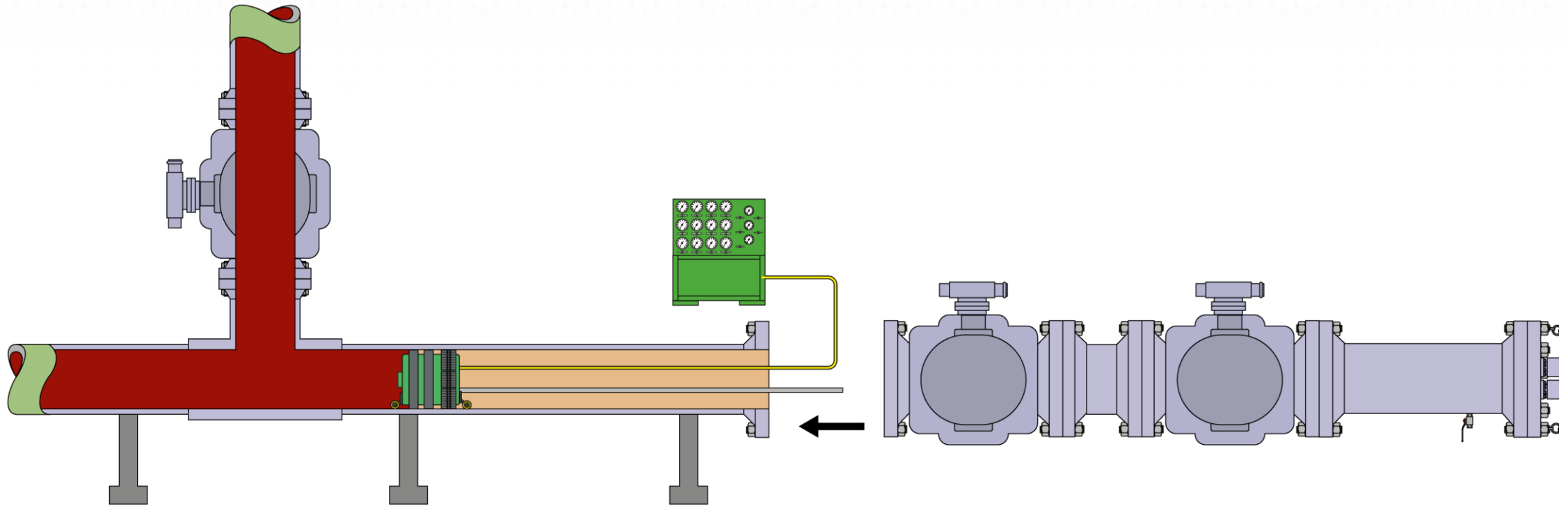
Set plug and prove Double Block isolation
Testing both seals with full pipeline pressure

Isolation Monitored – Breaking Containment Activity



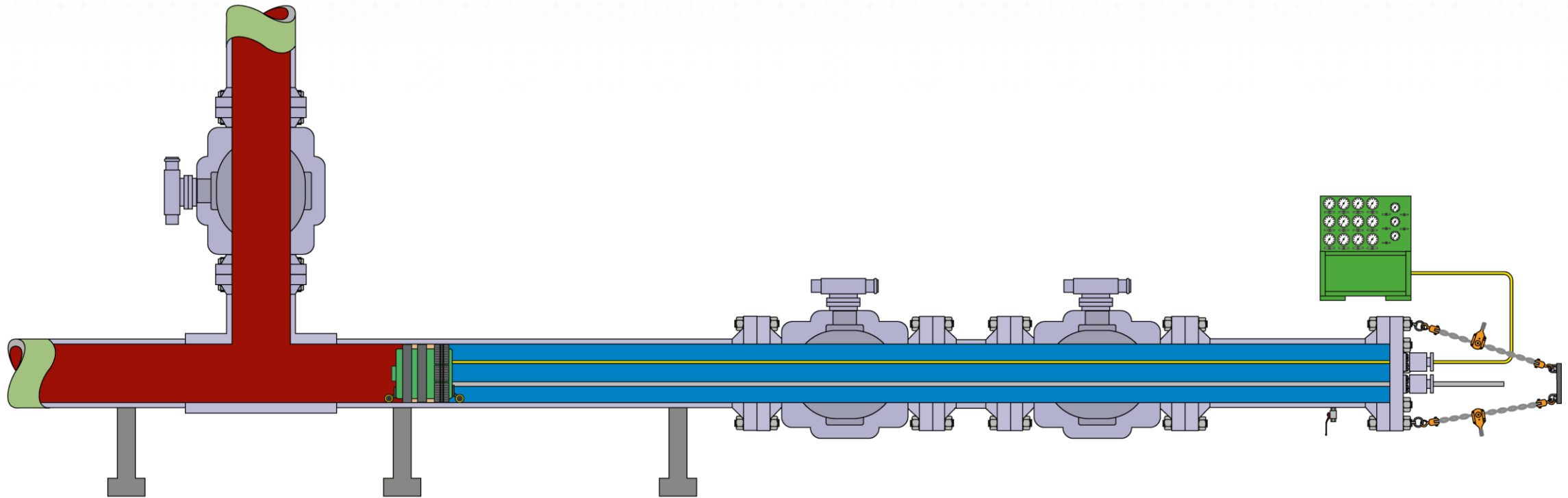
Disconnect and remove; blind ring, adaptor flange, slab valve and temporary launcher
Isolation is continuously monitored – by proceduralised tether management

New Valve Installation



New PLR isolation valves manoeuvred into position

New Valves Connected to Pipeline and Commissioned

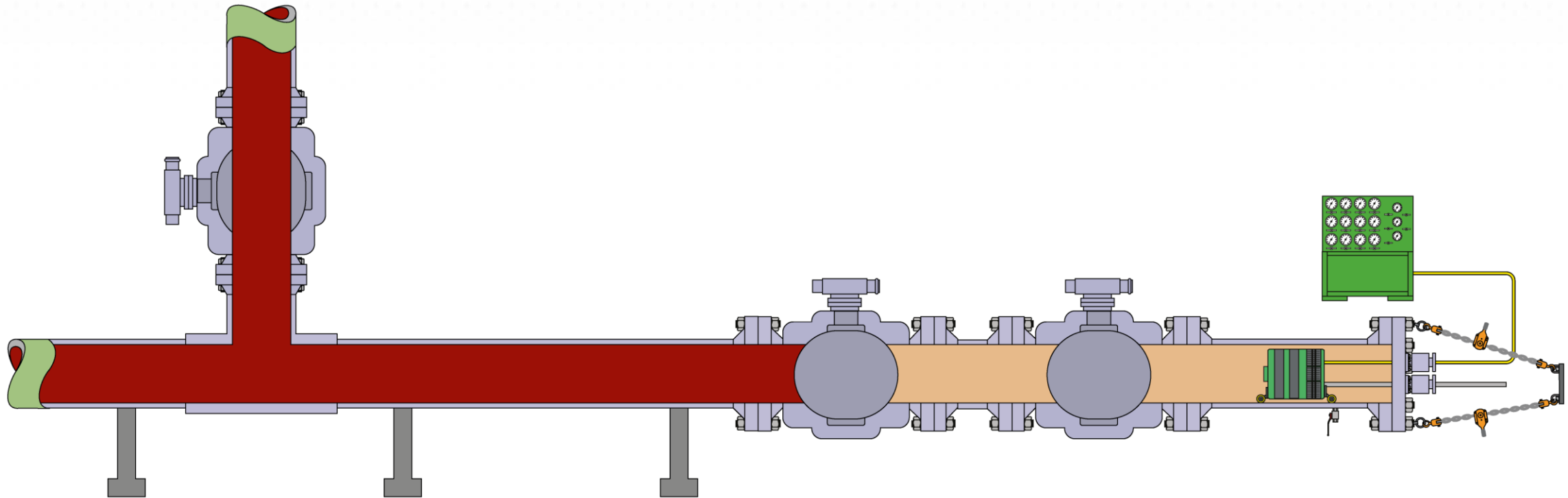


Install PLR isolation valves

- *Outboard valve is connected directly to pipeline termination flange*

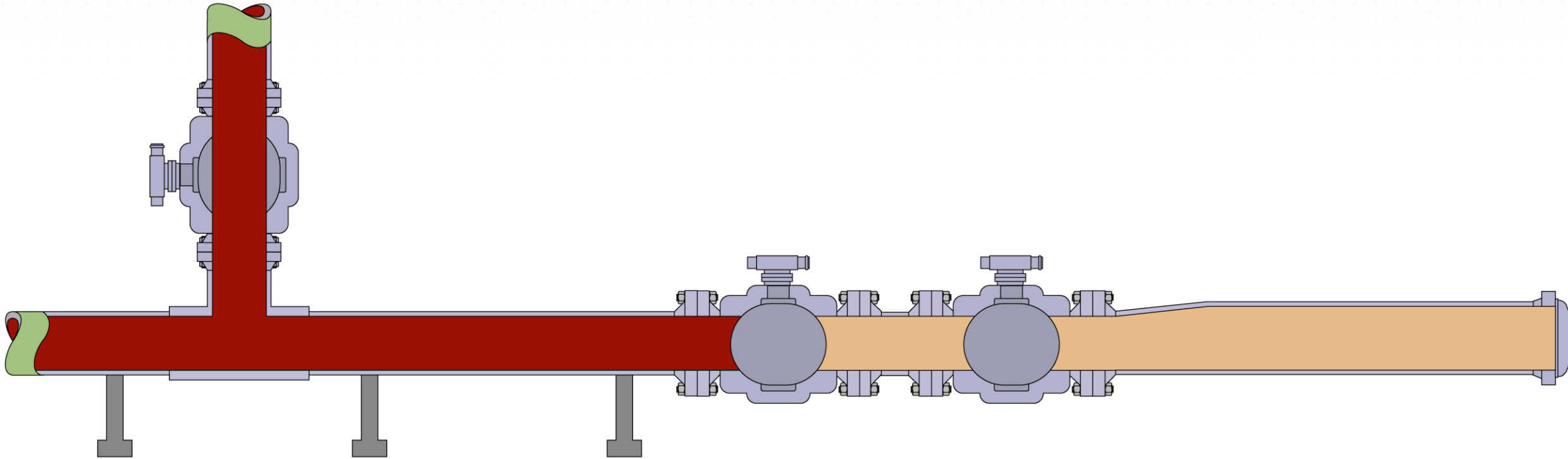
Leak test new joints

Isolation Plug Unset and Recovered



Equalise and unset tethered Tecno Plug
Recover plug into temporary launcher
Close new PLR isolation valve and prove DBB isolation

Pipeline Accessible for Pigging



Remove temporary launcher

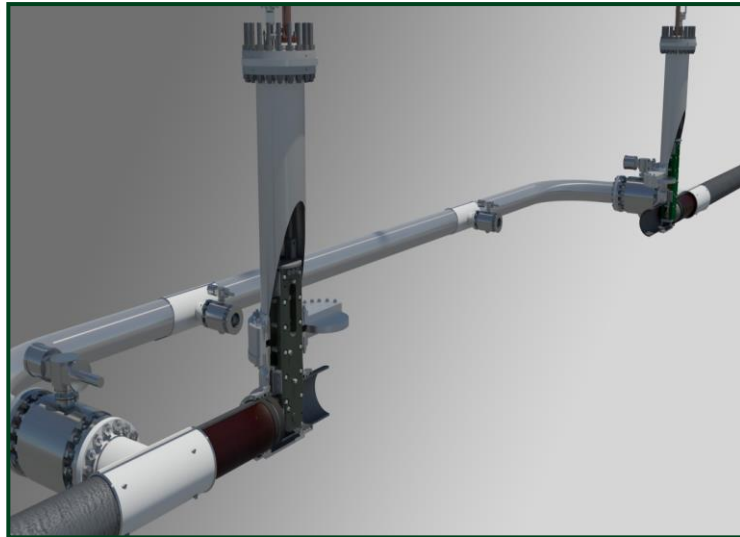
Install new permanent PLR

- ***Regular and Safe pigging operations enabled***

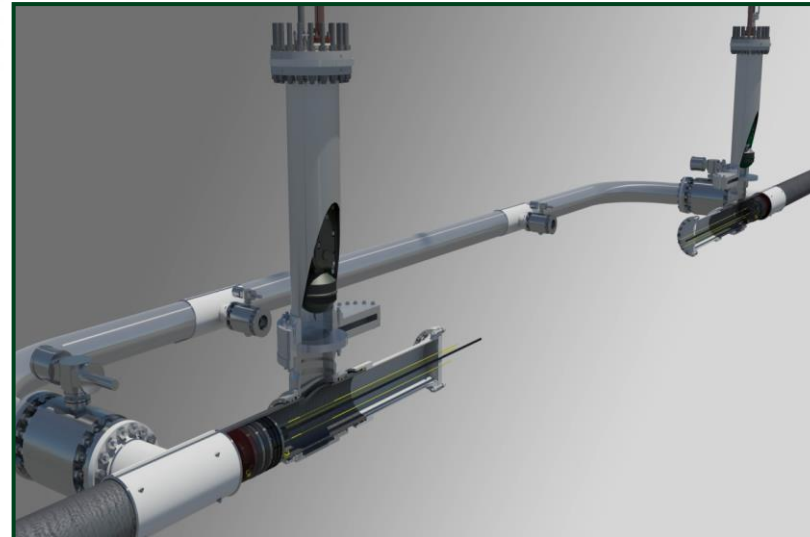
Installing PLRs Midline



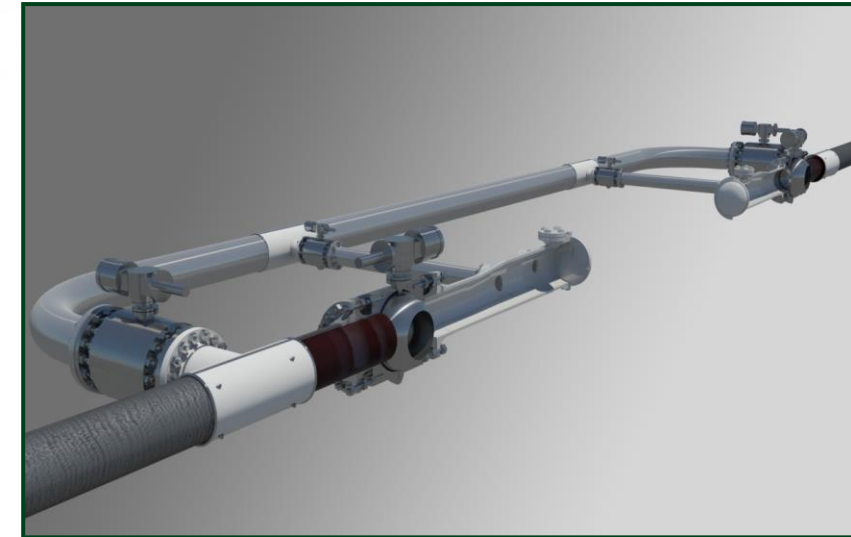
Type Approved: Fully Proved Double Block And Bleed Isolation Plugs – without shut down



Stage 1



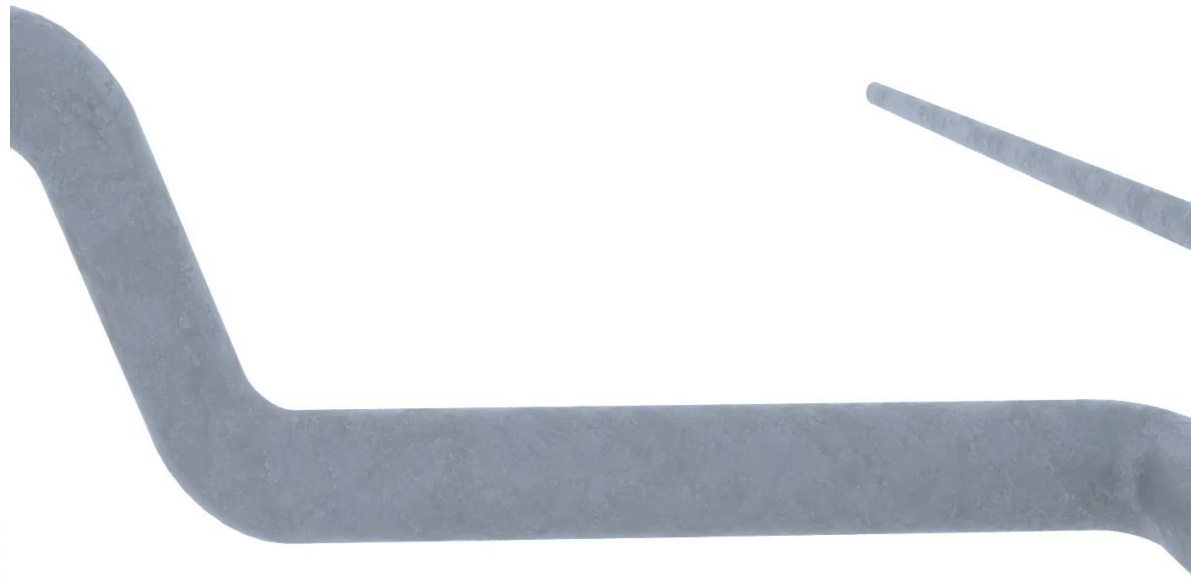
Stage 2



Stage 3

- 1) Fit hot tap tees for bypass and BISEPS , install bypass/kicker line, set BISEP isolation plugs, remove section between
- 2) Install temporary launcher with Tethered Tecno Plugs, Recover BISEPs, deploy Tethered Tecno Plugs
- 3) Install valves, fit temporary launcher, unset and remove Tecno Plugs, install PLRs and tie in kicker line.

BISEP Valve Installation Animation





**Thank You For Your Attention
Questions?**



Contact

Dale Millward

dale.millward@statsgroup.com

www.statsgroup.com



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