

Hydra-Valve
Advanced Valve & Pipeline Solutions

POWER
Pipeline Technology



Advanced Pressure Testing Ltd



Part of the Hydra-Valve World Wide Group

**The Hydra-Valve World Wide
Group LLC**

GROUP FORMATION

Since 2010 the company's portfolio of services has been further strengthened with the formation of the group of companies, consisting of Hydra Valve World Wide (Holding Company), Hydra-Valve Advanced Valve and Pipeline Solutions Ltd (HVL), Power Pipeline Technology (PPT), Advanced Pressure Testing (APT), Merlin Precision Engineering, Pipeline Maintenance International (PMI), Sub Surface Vision, Industrial Fasteners, and Richards Valves.

With this group a total service for valve and pipeline solutions is now available, giving truly innovative global services to the oil, gas, and water industries

About The Hydra-Valve Group

At **Hydra-Valve** we pride ourselves on our quality of service and ability to meet the needs of our customers. As the requirements of regulators and financial constraints become more stringent the continuous development of innovative techniques to meet these requirements is brought further into the forefront. Hydra-Valve continues to develop such techniques which bring with them huge benefits.

The Hydra-Valve Team

Our specialist, self sufficient and mobile teams provide on-site support for all your valve, pipeline, hydraulic and surveying needs. The extensive capabilities of the teams allow for quick and cost effective responses to all scenarios. Our teams are highly trained and experienced.

New Services

The Hydra-Valve Group of Companies has been further strengthened by the addition of;

Merlin Precision is a precision engineering and tool making company. With over 30 years engineering experience Merlin design and manufacture components for almost any precision engineering project, including emergency pace, with services including **CNC milling & turning, jigs and fixtures, press & mould tools, prototype work and general fabrication.**

The group has also been strengthened with the addition of a dedicated asset survey division. **Sub Surface Vision** specialize in **GPR, Sonar, Ultrasound, and full topographical surveys.**

Power Pipeline Technology (PPT) are a dedicated designer & manufacturer of live pipeline intervention equipment. Power also provide world wide service delivery specialist teams to the Oil, Gas, Water and Industrial sectors.

Pipeline Maintenance International (PMI) are a specialist pipeline service provider from intervention and repair to complete new installations. PMI also provide a huge array of pipeline, governor, valve & PRS services.

Advanced Pressure Testing (APT) is the most advance pipeline testing equipment & facility available today. Covering all forms of leakage, corrosion, pressure, permanent monitoring, ultra sonic, acoustic, temperature, in all environments including extremes and sub marine.

ABOUT THE HYDRA-VALVE GROUP – POWER PIPELINE TECHNOLOGY (PPT)

Power has been solving no shutdown piping problems since 1996. Power manufacture Hot Tapping equipment, Line Stopping equipment (stoppling) and bespoke fittings and equipment.

Our services include:

Pipe Freezing, Pipe Freezing services, Hot Tapping services, Line Stopping, Inline valves installed under pressure, Coupon Samples, Line Testing, Hydraulic Flow Dynamics, Butt Fusion, Pipe Laying Service, Data Logging, Valve Detection and Mapping, Cold Cutting, Cold tapping, Bolt Tensioning and Valve Turning Services.

Power's products, equipment and field services are designed to keep pipeline systems on stream and to prevent shutdowns. Power designs to domestic and foreign codes/standards and our quality control system assures the highest industry requirements are met and maintained through our ISO 9001/14001 procedures.





THE HYDRA VALVE GROUP – POWER PIPELINE TECHNOLOGY (PPT)

Power's design team have engineered pipeline products beyond our normal field applications including balanced pressure tapping with up to 153 Bar (2220psi) working and line stopping (stoppling) equipment up to CL900 working. Power also offers on-site welding facilities, fully coded pipeline welders and a full turn key operation.

We have worldwide coverage with service centres in the UK, Middle East; manufacturing centres in the UK, Saudi Arabia and Dubai and service partners in South and North America.

Problem solving has become a major part of our workload and the flexibility of Power's organisation enables rapid response to "one off" situations.

Power is on call 24 hours a day, 365 days a year. Our response time is based upon your needs.

Get connected to Power - Our products and services work best UNDER PRESSURE

THE HYDRA VALVE GROUP – RICHARDS VALVES

RICHARDS Valves Europe Ltd is an independent business based and registered in the UK to serve, supply and support all European customers of RICHARDS Manufacturing (Sin) Pte Ltd.

RICHARDS is a highly successful company with a wide range of quality industrial valves and associated products. Our range includes iron and steel valves and high quality fittings, all produced to ISO / BS / DIN / API standards. We supply worldwide into the WATER, MARINE, OIL & GAS and PETRO-CHEMICAL industries.



Advanced Pressure Testing (APT)

OUTLINE

Pipeline Maintenance International, (PMI), part of the Hydra Valve Group of companies, (HVL), jointly with Advantica and British Gas and National Grid, developed a very advanced form of pipeline testing. We found that there was no testing system currently available anywhere in the world that could accurately measure and detect pipeline leaks on major pipeline installations very accurately and in an acceptable time frame resulting in major cost savings to each project.

PROBLEMS FACED

It is extremely difficult to accurately measure leakage on large pipeline volumes during pre-commissioning and pressure testing. Particularly in polyethylene pipes, a period of time must elapse to avoid creep, (pipe expansion due to pressure). This affects the measured pressure. Even small fluctuations in temperature can also mask the pressure changes due to leakage. All forms of plastic pipeline caused problems as the creep/growth/shrinkage rates of plastic pipelines in widely varying external atmospheric pressures, internal differential pressures and temperatures could vary dramatically. No system could identify these parameters quickly enough so the world wide industry relied on very old forms of testing including hydro-testing, (hydrostatic). Although accepted within the industry as the norm, these prehistoric methods were very costly, took huge resource and a long time to perform. Often testing of costly new pipelines would take weeks to perform. This cost the EPC's and the pipeline owners a huge amount of time and money. In all, very inefficient.

SOLUTION

To develop a revolutionary new type of pipeline testing method that eliminated much of the downtime and massive costs associated with the old and traditional methodology of pipeline testing. A huge reduction in manpower and in equipment resources resulting in the most advanced and efficient testing procedure available today. Major costs have now been eliminated but the savings don't end there. Due to the vastly improved testing time, (average 95% quicker), the pipelines can be re-packed and commissioned into use far quicker meaning advanced revenue acquirement by the owners. Bringing the pipeline into commission far more quickly means immediate on-stream revenue reducing the huge overheads related to pipeline commissioning, rehabilitation, repair or new installations.

The APT system uses state of the art computer systems and software to make all of the intricate but necessary calculations/computations while delivering an immediate result for the user. No longer is there a need to wait for time consuming bleed off pressure or hydro tests before commissioning the pipeline. We then studied in great detail the same parameters on all forms of metal pipelines, classified as, (hard), pipelines. We found that a whole different set of parameters were found so we then had to go thru the same time consuming test procedures to evaluate a measuring procedure that would work as effectively as with the plastic pipeline systems. We found that different expansion and contraction parameters occurred in each different type of hard pipeline depending on the construction metal used, e.g. steel, iron, ductile, spiral, seamless, seamed etc.

Our pressure testing software has built in creep compensation algorithms, based on known knowledge of all pipeline material behaviour.

Our Advanced Pressure Testing system uses state of the art technology. It uses a combination of techniques to analyse the change in temperature of all air within the pipeline. By also using acoustics, highly sensitive microphones and speakers we can generate an extremely accurate measurement using known factors. By placing the speaker and two way microphone in the pipeline, a complex pulse and echo technique is used to measure the sound speed.

The speed of sound varies with temperature changes. We can use this to accurately determine average changes down to an accuracy of 0.0001°C. Our system then uses this information to accurately compensate for pressure readings. These readings are calculated at the rate of only 30 milliseconds.

Pressure variations identified are mapped against temperature and time compensation factors to deliver the most accurate leak detection method ever.

INVESTMENT

Major investment was made. This investment totalled over £6m and was on-going.

PMI's roll was to fund and test the equipment both in house and on live pipeline projects.

Labour, materials, equipment and expenses totalled an additional £1.8m over the 5 years.

RESULT

The Advanced Pipeline Testing, (APT), was designed, developed, tested, and manufactured. This development took more than 5 years and we endured thousands of hours of design and testing to be able to make the necessary modifications and revisions to both the hard and software. Typical time savings are easily provable using many case studies conducted over this time period. We also use each current project as an example of cost and time savings to give us a lifetime saving per project.

As an example the standard pressure leak test for a small 10" gas main of 3km pipeline we completed for British Gas was as follows;

Normal test procedure:

Standard Hydro test for this installation indicated a conditioning time (to allow for pipeline creep), that was over 100 hours. There was then a test time of 188 hours. Current International standards demanded conditioning plus test time of 288 hours. This gives a total test time of 2 weeks at 24 hour days!

APT PMI test procedure:

- The APT system was used on day one of pipeline completion. It detected a 0.28scmh, (10 scfh), leak which was then immediately repaired. After the repair, the test proved that there was no leak and the pipeline was put into commission straight away.
- No second test was required.
- Time saving was calculated at 278 hours. This included the pipeline repair! In all we saved almost all of the original two week test time.

Benefits

- Huge cost savings, typically testing procedures can amount up to 10% of the value of the pipeline, for a major pipeline this can be many \$m's/£m's. APT will offer cost savings of 90%+ over these traditional methods and costs.
- Up to 95% saving on test time. Instant results and certification means major time savings
- Huge savings on resource means savings per test of 95%+ on manpower and equipment
- Environmentally friendly (no water or additional chemicals or energy generation needed)
- Eliminates logistical and transportation problems associated with hydrostatic testing in remote locations
- Incredibly fast and accurate testing of all pipelines
- Elimination of long pipeline conditioning times
- User friendly windows based software which can be pc, laptop or tablet based operation and sent directly via sim/gps to a central operation or control

- Simple hardware installation fully ATEX approved and intrinsically safe for all environments. Can also be provided fully waterproof.
- Automatic test certificate generation
- Instant leak discrimination
- Truly non-destructive
- Very easily transportable in suitcase sized carrying container, (truly modular)
- Very robust using tough site performance components and Toughbook type laptop or dedicated hardware
- Conventional tests mean that two or even three tests may be necessary causing severe downtime delays, this is eliminated using our system
- Improved reliability over conventional methods

Current Situation

Hydra Valve AVPS Ltd. acquired the worldwide IP, copyright and license for APT and are now the sole owners. We are funding huge developments of this testing equipment to explore even more options including Tanks and storage facilities.

Marketing and Business Development.

Every pipeline operator worldwide. Every pipeline contractor, repairer, pipeline designers, manufacturers and more. Particularly useful for testing and approval houses. The demand will be incredible. The benefits are huge, and this system will easily become the world's leading pipeline testing solution. The opportunities for this equipment are huge.

We will have worldwide service centres either owned or contracted under an additional license agreement. This is truly future proof and will provide instant and future benefits to all users. As the system continually develops, so does our ability to market this into new sectors. Particularly interesting will be pressure vessels, tank systems and containers. Anywhere we find containment can be a new market for this equipment. We have already tested the market for interest however we have not started our marketing plan yet.

A recent merger between DNV and GL Noble Denton has formed one of the world's largest Testing and Approvals Company's. They contacted HVL after several very successful tests of our APT equipment. They quickly noticed the advantages of using the APT equipment over all others available.

Balfour Beatty, the largest UK civil engineering company have just won a £1.4bn contract for British Gas and have appointed Hydra Valve AVPS as their strategic business partner. We have major interests from most of the world's leading oil companies and pipeline operators. Particular importance should be placed on pipeline designers and installers.

ADVANCED ACOUSTIC PRESSURE TESTING

- Technology to ensure integrity of new pipelines
- Traditional technique is to allow a settlement time for expansion of the pipeline (creep) and cooling of the test air, resulting in long extensive test periods
- Small fluctuations in temperature and barometric pressure can introduce further inaccuracies to the test
- All the above can mask pressure changes resulting from leakage

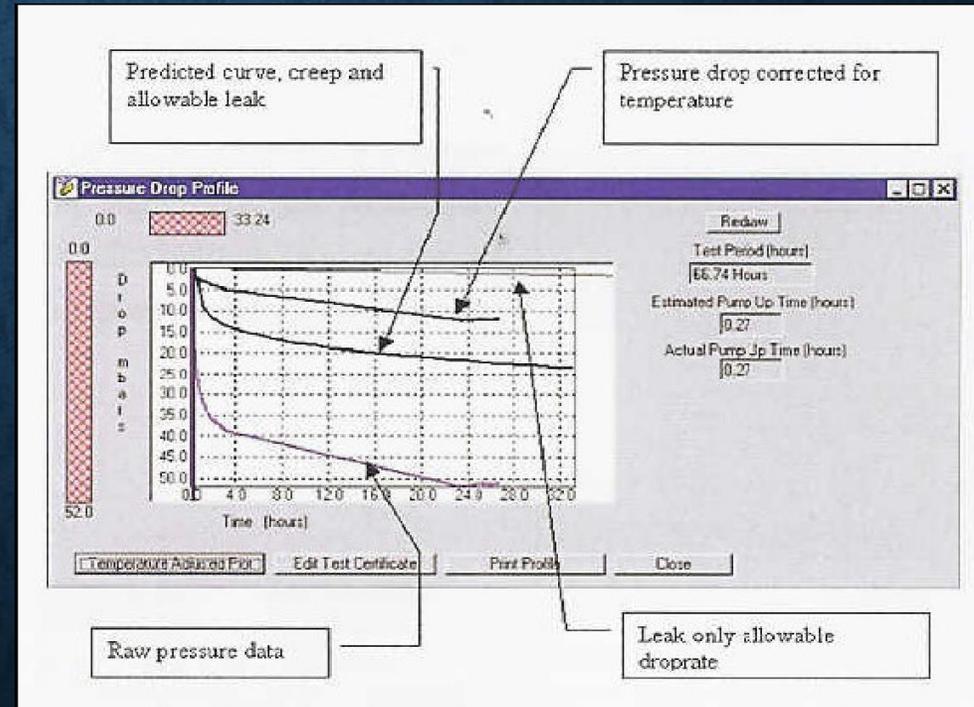


SOLUTION – ADVANCED ACOUSTIC PRESSURE TESTING

AAPT system operated by PMI measures the temperature change inside of the pipe using acoustics

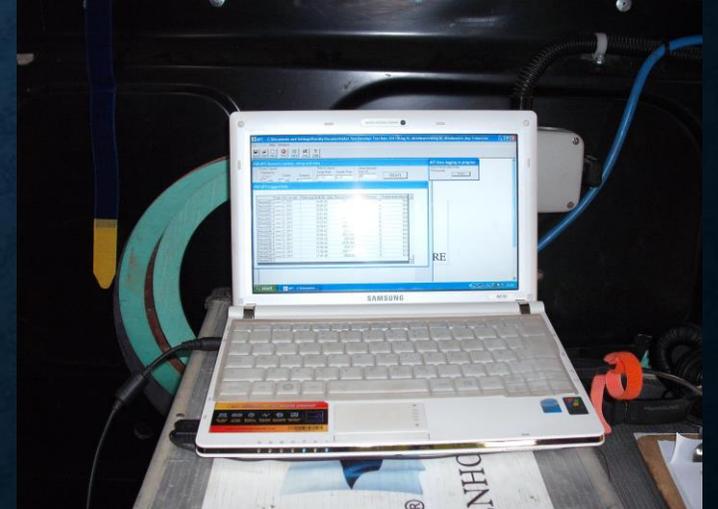
An easily installed loudspeaker & microphone utilises a pulse echo technique to measure sound speed (speed of sound varies with temperature)

Pressure test software has built in creep compensation algorithms based on sound knowledge of polyethylene behaviour



BENEFITS

- Fast Accurate testing
- Automatic test certificate generation
- Up to 75% saving on test time
- Earlier leak detection
- Can easily detect blockages such as stoppers or water ingress
- If sectorising to find the location of a leak, the use of AAPT makes the process much quicker
- Digital auditable records



HISTORY

- **2003 - PMI formed by former 'British Gas' Management team**
- **Experienced staff**
- **Strategic Alliances with key partners**
- **Extensive client list**
- **Expanding capability profile**
- **April 2006 - Acquisition by Denholm**
- **Jan 09 - Denholm Pipecare – Part of Denholm MacNamee**
- **February 2013 – Acquisition by Hydra Valve AVPS**
- **March 2013 – becomes part of The Hydra Valve Group**



PMI CAPABILITIES

The following capabilities apply to Gas, Oil, Petrochemicals, and Water etc. operating at high pressures, or specialist operations and medium or low pressures.



PMI CAPABILITIES

- Pipeline Damage Response
- Pipeline Inspection & Repair
- Pipeline Replacement & Rehabilitation
- Specialist Pipe laying
- Pipeline Maintenance
- Pipeline Intervention
- Specialist Connections
- Pressure Testing
- Technical Consultancy



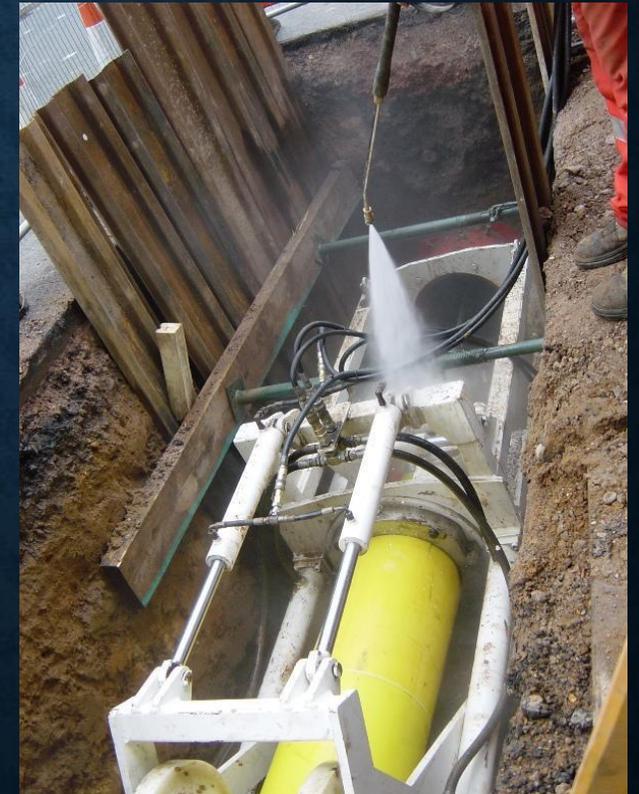
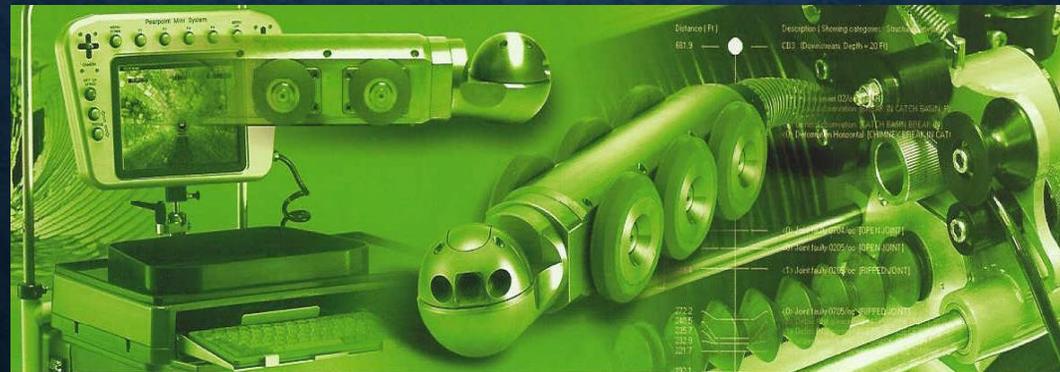
PIPELINE DAMAGE RESPONSE

- 24 Hour, 365 Day service
- Emergency response covering high pressure and specialist pipelines
- Bespoke System Design
 - Levels of response
- Pipeline damage assessment & repair
- PLIDCO® Repair Clamps
- Epoxy Shells
- Clockspring
- Composite Repairs
- Full stopple & Bypass operation



PIPELINE REPLACEMENT & REHABILITATION

- **Swagelining & CCTV**
 - - Creates a barrier – leaks/aggressive product etc
 - - Renewal
- **Swagelining of specialist plastics**
- **Pipe bursting**
- **Grundoram**



SPECIALIST PIPE LAY

- Large Diameter couplers
- First of its type in the UK
- Capability – potential up to 1.4m



PIPELINE MAINTENANCE

Online Inspection Work

Pig Tracking

Pig Track Maintenance/Fitting

Pipeline inspection & cleaning

Long Range Ultrasonics (GUL, PIMS, T Scan)

Corrosion monitoring Systems

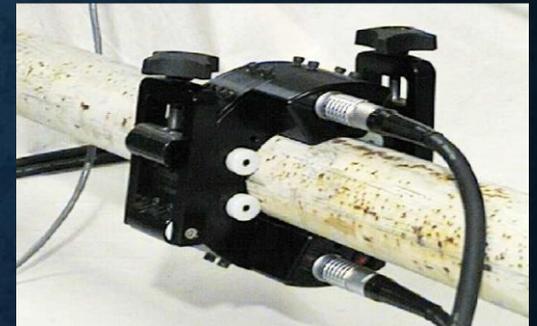
Pipeline Damage Assessment & Repair

PLIDCO® Repair Clamps – Exclusive UK Agent

Composite Repairs including 3X

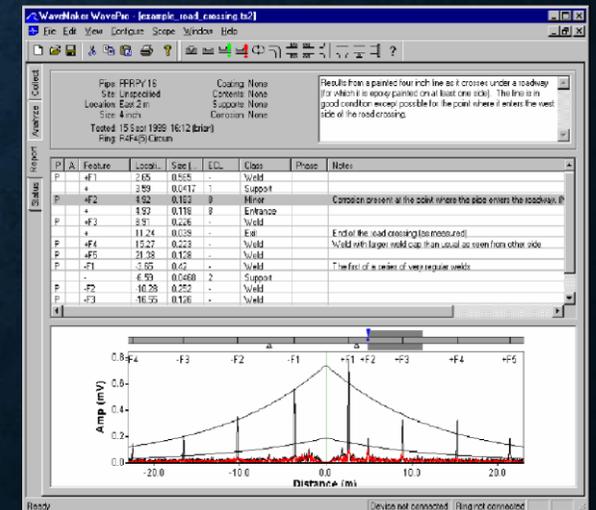
Epoxy Shells & Tees

Clockspring



BRIEF OVERVIEW OF GUIDED ULTRASONICS

- 100's of meters of pipe are examined from one location
- Difficult to inspect areas, such as insulated or buried sections of pipes can be screened for defects
- 100% of the pipe is inspected (within the diagnostic length of a test)
- Pulse echo type operation provides accurate information on feature position and approximate size
- Can be performed without taking the pipe out of service
- Sophisticated analysis aids interpretation of results – detailed report produced for the client tailored to fit their needs



PIPELINE REPAIR AND MAINTENANCE PRODUCTS



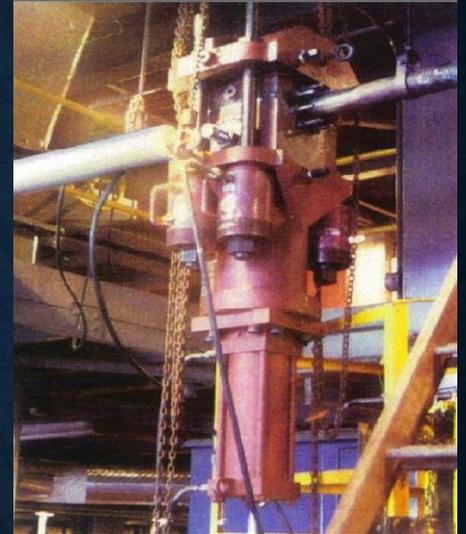
- Exclusive UK agent for PLIDCO®; a pioneer in pipeline maintenance and repair fittings
- A comprehensive range of PLIDCO® products
- High and low pressure pipelines at a variety of temperatures
- Versatile and easy to install
- Vast assortment of sizes to choose from at 1.5" to 48" in diameter (API) and pressures up to 3,000 psi.
- All products are designed to quickly and safely repair pipelines, thus minimising unnecessary shutdowns, saving risk, time and money.

PLIDCO® REPAIR AND MAINTENANCE PRODUCTS

- PLIDCO® Split + Sleeve Standard Repair Clamps
- PLIDCO® Split + Sleeve Extra Long Repair Clamps
- PLIDCO® Weld + Ends® Couplings
- PLIDCO® Smith + Clamp™ and PLIDCO® Weld + Cap
- PLIDCO® Shear + Plug™ (for high temperature, high pressure flowstops)
- PLIDCO® + Flange
- PLIDCO® Flange + Repair-Ring
- Fittings can also be custom designed to meet special requirements

PLIDCO® SHEAR + PLUG™

- The PLIDCO® Shear+Plug™ is ideal for high pressure, high temperature flowstops.
- Provides a reliable, safe method to temporarily isolate sections of hazardous piping for repairs or valve insertion.
- This solves high pressure/high temperature line plugging problems, which would have previously required expensive shut-downs, by providing a positive metal-to-metal seal, complete with sealant backup.



BENEFITS OF PLIDCO[®] SHEAR+PLUG[™]

- Rated at ASME B16.5 (1480 psig at 100°F., 825 psig at 800°F)
- Exclusive PLIDCO[®] innovation to isolate high-pressure pipelines
- Excellent value (in comparison to time-consuming shut-downs)
- Resists high temperature and high pressure
- Metal-to-metal seal
- No shell cutter is used to enter pipe
- Cuts one piece retrievable coupon
- The PLIDCO[®] Shear+Plug[™] is impervious to flow rate, making it ideal for boiler feed applications
- Available in pipe sizes 1.5" to 10" (with other sizes also considered, subject to requirements).

PIPELINE INTERVENTION

- High pressure pipelines up to 70 bar
- Specialist pipelines, including polyethylene
- Fitting of saddles, tees & valves
- Hot taps including stopple work



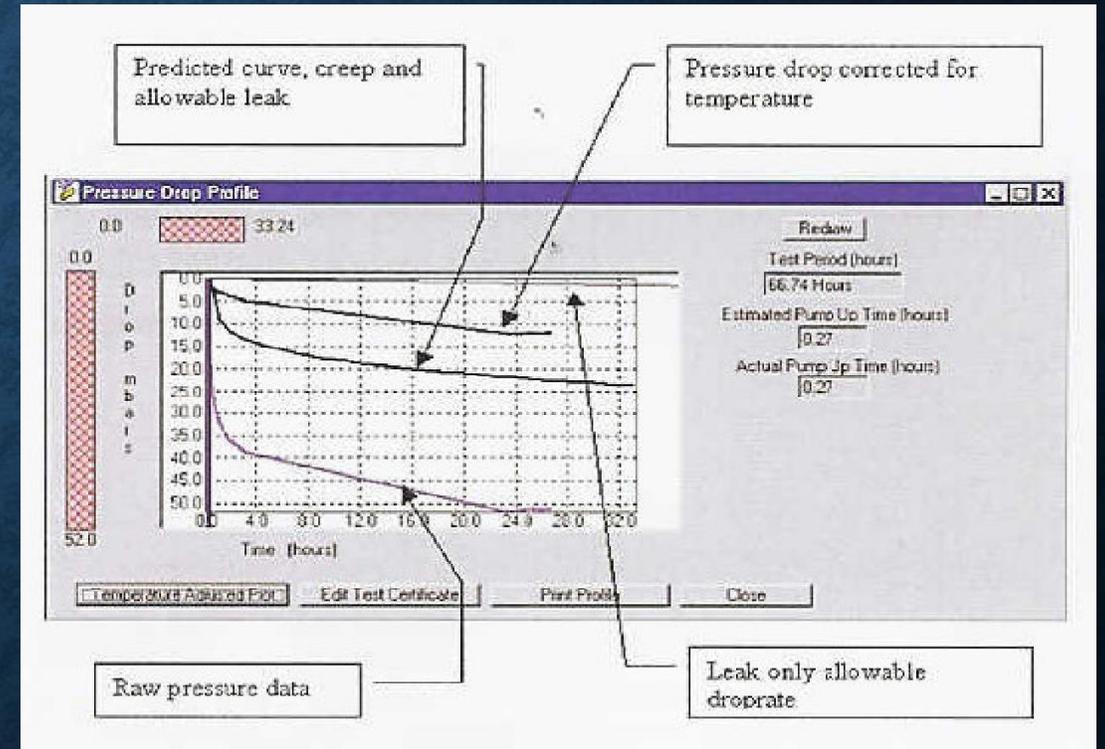
SPECIALIST CONNECTIONS

- Steel hot taps up to 100 bar
- Ductile iron & cast hot taps
- Supply of hot tap & stopple tees/Valves
- PE branch connections & couplers including PE100
- Hot taps for stopple work



OTHER PRESSURE TESTING

- Hydrostatic
- Pneumatic
- Advanced Pressure Testing (APT)
- De-watering and drying



TECHNICAL & PROFESSIONAL CONSULTANCY

- **Technical Pipeline Expertise**

- Specialist PE Consultancy
- Emergency response
- Hot tap & stopple

- **Project management, Supervision and Planning**

- Organising Labour and Equipment

CUSTOMER CARE

In all aspects of our works, we provide quick, cost effective, efficient and quality solutions. We will continue to ensure the safety of our customers, the public and our employees.

CUSTOMER CARE

- **Training – Ensuring employees are safety aware & technically competent**
- **ISO 14001 environmental systems – Ensure we consider environmental aspects in everything that we do**
- **ISO 9000 quality systems – A robust quality system that covers : Quality audits, customers satisfaction etc.**
- **Health & Safety OHSAS 18001 – Robust health & safety management system in place.**
 - Audits on compliance with HS&E requirements

HSE

- **At PMI Pipecare we take Health & Safety very seriously. All our practices & procedures comply with HSE guidelines.**
- **We regularly implement new, innovative safety procedures and use up-to-date safety equipment & clothing to minimise the potential dangers inherent within the pipeline industry.**
- **Specially trained staff and special equipment is used to reduce the risk to both the environment & the general public, when dealing with hazardous materials such as Gas, Oil & Petrochemicals. All our technicians are confined space trained.**

HSE

- **As well as regular inspections by independent HS&E consultants, we carry out our own HS&E audits to ensure our staff's Health, Safety & Environmental knowledge is current.**
- **Expert consultants and our own in-house safety managers work closely with our client's safety officers to ensure the safety & welfare of the public, our staff and all operational sites.**

Excavations

Before excavations commence, extensive survey & mapping takes place, using the very latest state-of-the-art equipment to fully understand what lies below the surface. This quickly identifies services including, Water, Gas, Drainage services, HV & LV cables, BT (telecom) cables, Optic Fibre, Cavities & Voids, Sub-Surface Composite or any other detail.

Our equipment includes, Ground Penetrating Radar, Electro-Magnetic Locating Equipment, GPS location reporting, Collection & Storage of Service data and full map CAD production facilities to any size, including A0 & A1. All survey results are guaranteed

Massively complicated excavations safely avoiding every possible service are made easy because of our highly trained and uniquely qualified engineers/technicians using this state-of-the-art equipment

The laying of a brand new mains pipeline, insertions of new control valves and major pipeline repairs, all successfully completed through an array of complicated services.



Emergency Repairs

Stop Kits

Stop Kits installed under pressure at up to 80 Bar. Installed within 4 minutes of installation technician contacting pipe

Pipe Wrapping, Pipe and Joint Failure and Corrosion Repair

Rapid pipe encapsulation without survey or lead time. Working pressure up to 100 Bar. Cure time 30 minutes. WRAS approved.



Excavation – Reinstatement

Every possible control measure is put in place by our expert teams before the commencement of any excavation procedure. Full reporting, risk assessments & methodology statements are generated for approval by the client before any working procedure begins.

Reinstating a major project to the highest standards, finalises the procedure.

The re-laying of private roads, pathways & drives is all necessary when the project runs on private property or land



Encapsulations & Joint Repairs

Joint Repair

Full Joint Repair. Joint and Pipe Stabilisation. Accommodates unusual angles. Complete and under pressure in most circumstances.



Encapsulation

Rapid manufacture and off the shelf stock items. High pressure and installed under pressure. WRAS approved resin filled to prevent stagnated water entering the pipe line from the encapsulation when system pressure reduces.



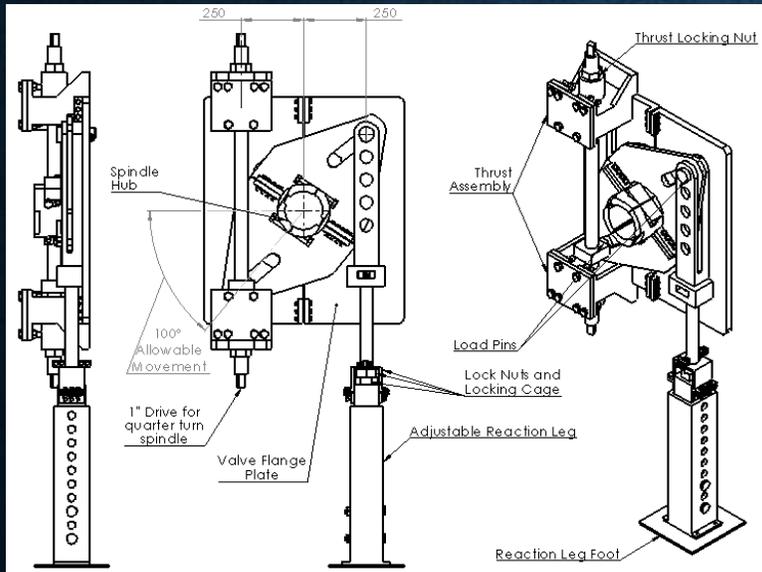
Hydraulic Systems and Actuation

Hydra-Valve & Power have in house design, manufacturing, installation, assessment, maintenance and rectification service for all utility hydraulic system requirements. Numerous benefits are gained by utilising hydraulic systems over other systems. This includes risk reduction, submersible operation, multiple back up system for emergency situations accurate positioning feed back for actuator systems, solar power and wind powered operation and cost reduction.



Valve Locking & Stabilisation

The HVL-L System of Valve Locking and Stabilisation removes the risk of spindle ejection or rotational movement when working in or around a valve when there is a risk of the thrust retention component failing or it is to be removed



Cold Cutting & Pipe Freezing

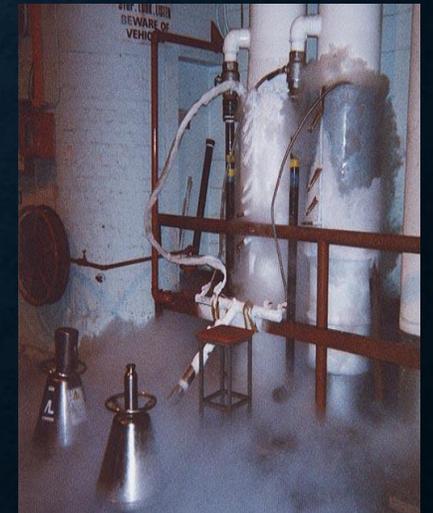
Cold Pipe Cutting is one of the safest systems available. It is accurate, flexible, versatile and produces little waste. Involving little or no downtime it offers major cost reductions. Power has equipment that consists of travel L cutters, split frames and guillotine saws in sizes from 4" through to 60" diameter.



Cryogenic Pipe Freezing

We offer what is considered by Engineers to be one of the most efficient and cost effective means of pipeline isolation for maintenance programmes. Power Pipeline Technology works to a high degree of proficiency, and provides services on a 24 hour basis, nationwide.

Fast, reliable, 'highly cost-effective' – these are the widely acknowledged benefits of pipe freezing



Tight Fit Lining

Rapid, cost effective installation of tight fit lining systems



Liner pipe being pulled through the die

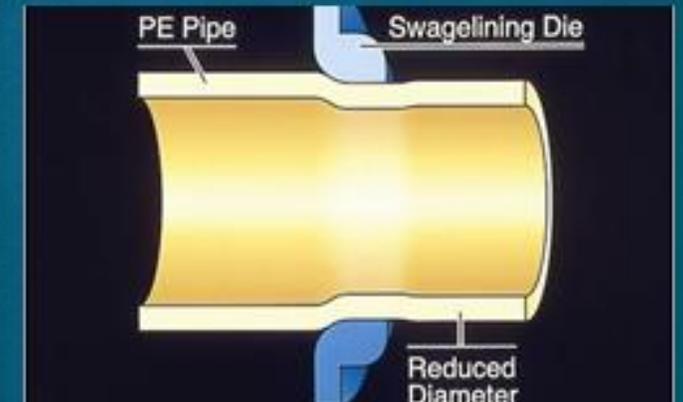
Market Potential:

The Tight Fit Lining process has been used to protect and extend the useful life of pipes in a wide range of industries including gas, mining, oil fields, potable water, municipal sewer systems (force mains), and many other types of industrial applications.

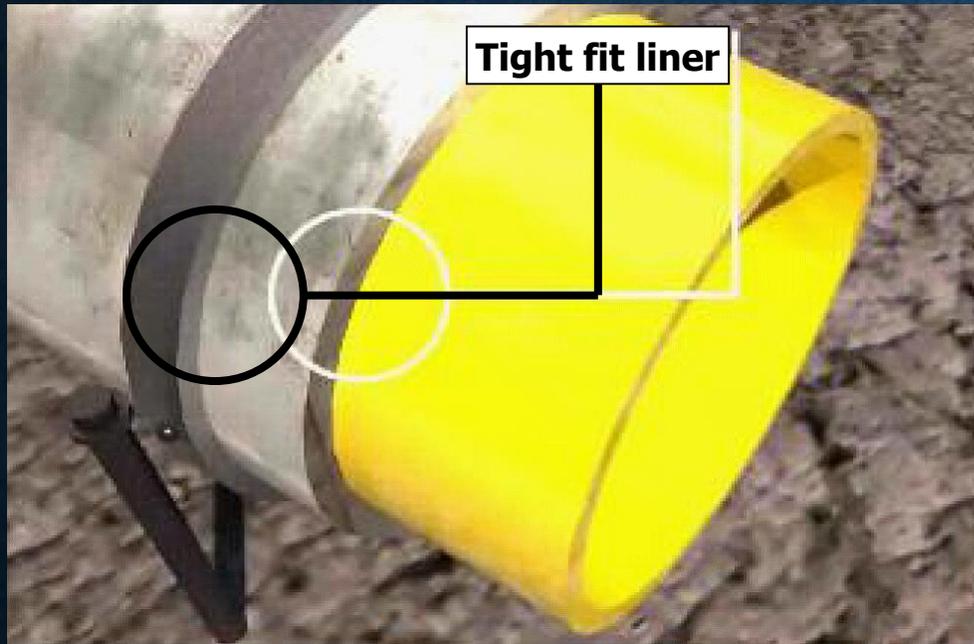
Cutting Edge Technology:

Tight Fit technology has been used around the world to extend the working life of new and existing pipeline systems by inserting a polymer liner into the host pipe. The lining process was originally developed in the late 1980's and has been improved upon ever since. No other tight fitting polymer lining system has been so thoroughly tested or so widely proven by actual use as Tight Fit. In fact well over 1000km of pressure pipe in sizes up to 60" have been lined by this process.

Tight Fit Lining is an outstanding trenchless technology, particularly in crowded, or environmentally sensitive areas, where fast, safe and cost-effective solutions are required.



Why choose Tight Fit Lining?



Pipelines are coming under increasing pressure to meet the needs of today's society and the developing environmental challenge. The tightening of budgets increases the need for cost effective solutions, whether this the rehabilitation of an existing pipeline or the increasing the design life of a new pipeline.

- Cost effective
- Minimal impact on environment
- Proven technology
- Long term solution
- Structural or non structural liner
- Denholm Pipecare technicians have over 20 years experience of Swagelining/Tight Fit Lining

Valve installations Live & under pressure

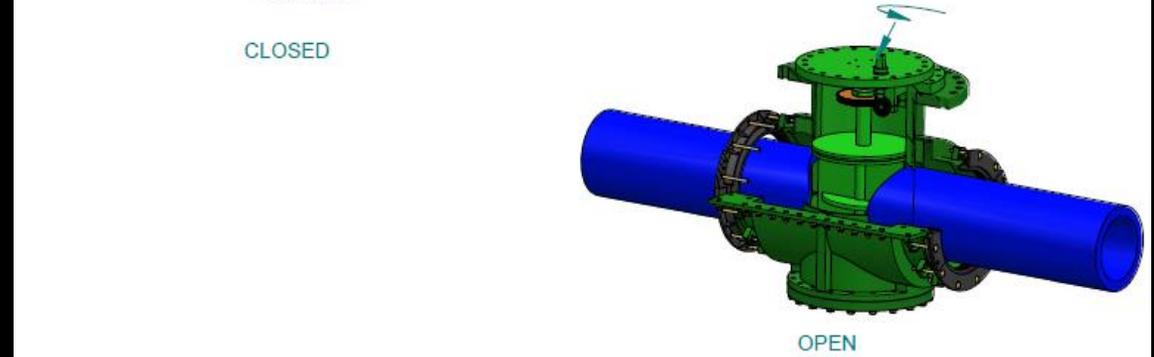
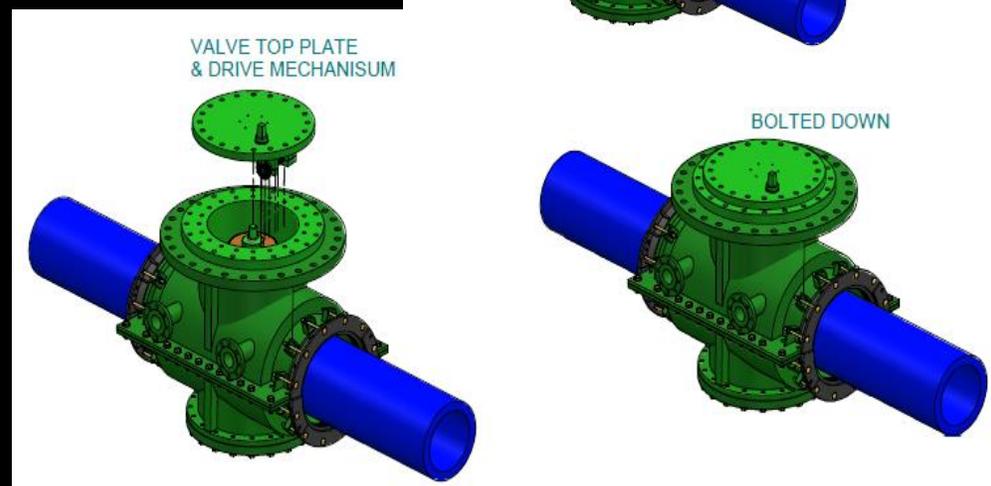
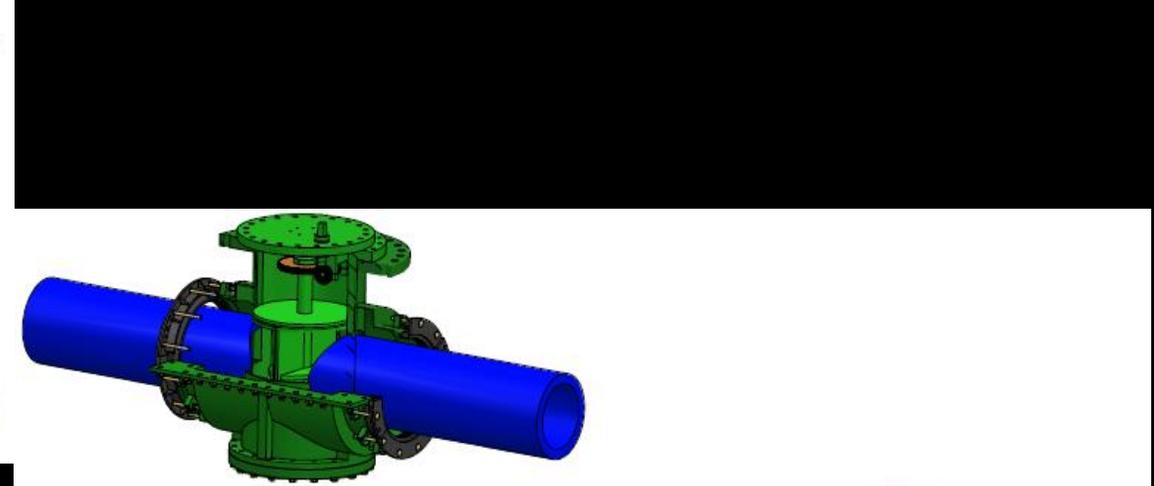
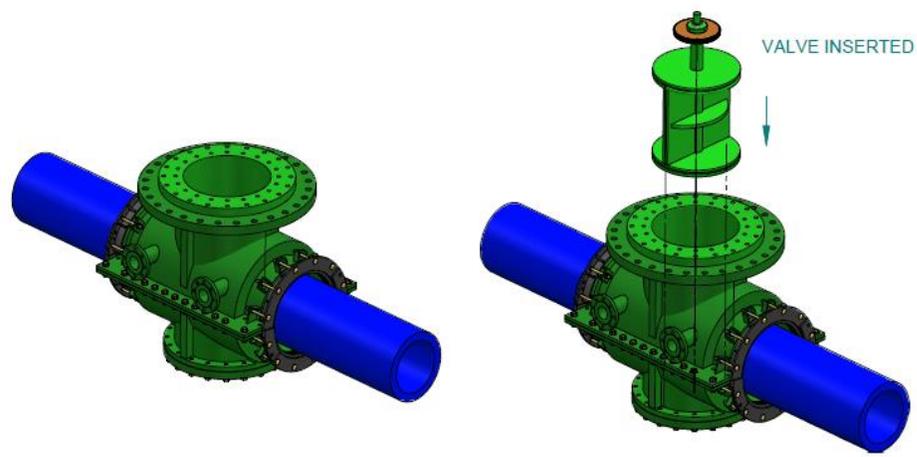
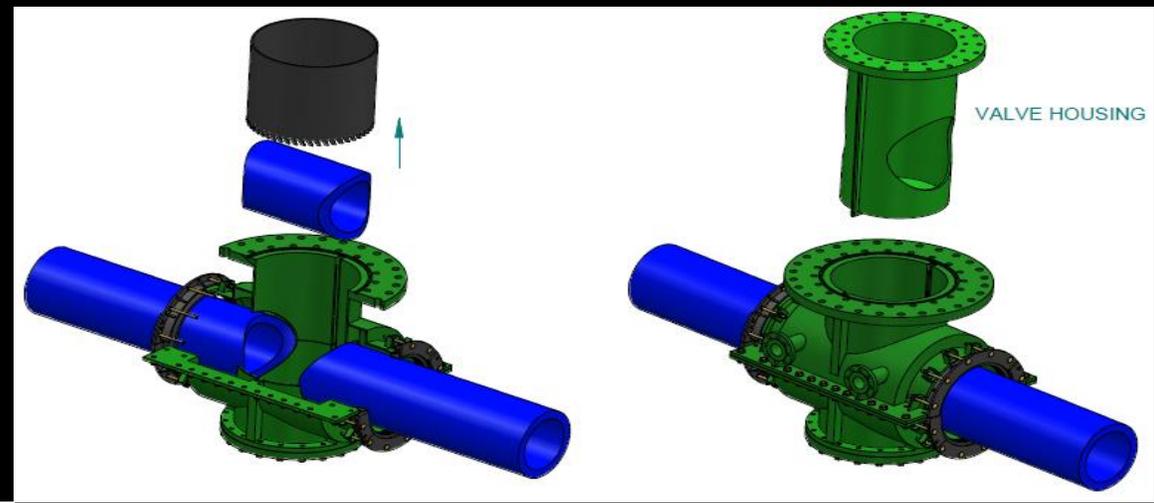
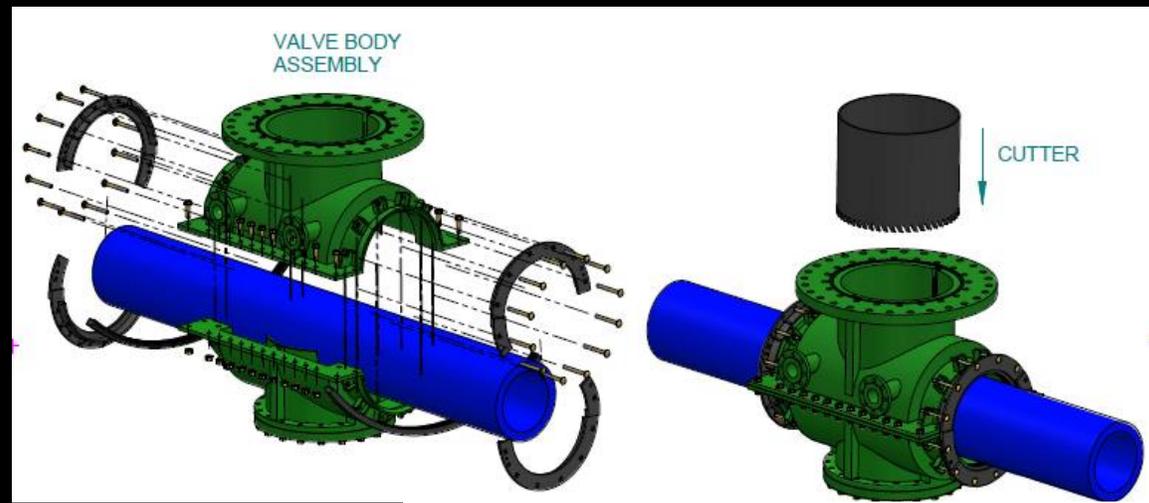
Power Valve

A new development to the Oil, Gas and Water Industries, the Power Valve allows for the insertion of a fully functional valve to a pipe line under full pressure.

The valve (rated to 16 Bar) is then capable of being operated with standard valve operating devices.

Compared to conventional very costly systems it becomes clear what advantages the Power Valve gives in terms of both cost and time. The patented Power Valve system provides a much needed improved process for installing a valve in a pipe run carrying a flow of fluid





Pipe laying – Long & Short Distance

To successfully plan and manage the largest diameter project ever attempted in the United Kingdom.

To overcome the operational difficulties associated with large diameter pipes and fittings, including the development of a prototype all-terrain, self-propelled 100 tonne winch.

A ground-breaking replacement project to rehabilitate approx. 240km of 39" to 42" Large Diameter Main.



Individual pulls in excess of 800m have been achieved.

Manufacturing Division

Hot tapping machine manufacture - Hot tapping machines, tapping machines, line stop equipment manufacture, and stoppling equipment manufacture.

Production and manufacture of:

- **Hot Tapping equipment manufacture from 1/2" to 96"**
- **Line Stop equipment, stoppling equipment including Power stop 1/2" to 60"**
- **Line stop and Hot Tap fittings, high and low pressure**
- **Off tees and mufflers for all pressures**
- **Sandwich valves**

Hydra-Valve and Power Pipeline Technology can also offer full rolling services from 1mm to 25 mm plate to 4 metre diameter tubing, the fabrication and machining shop is fully equipped with vertical and horizontal borers and up to date CNC lathes and milling machines and laser profiling.



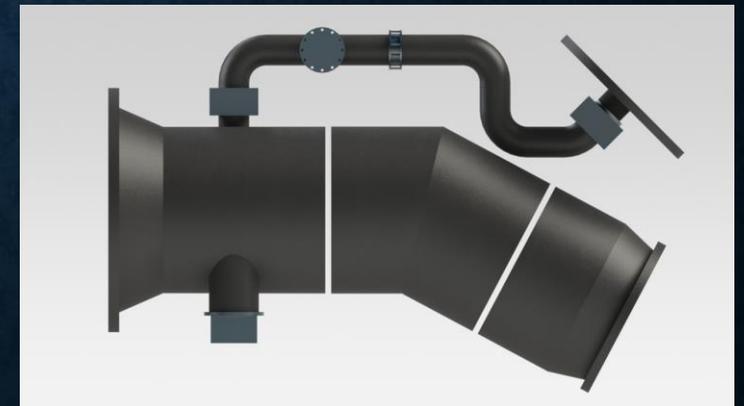
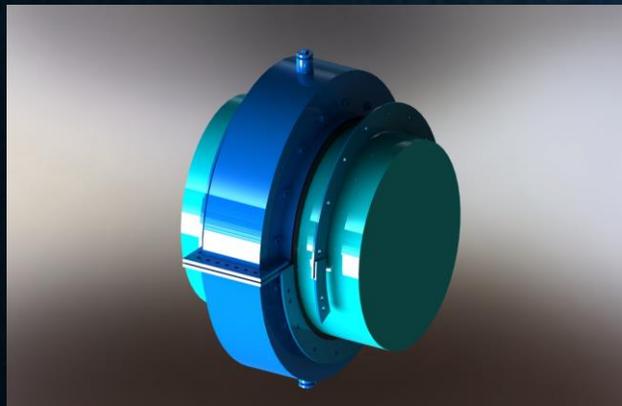
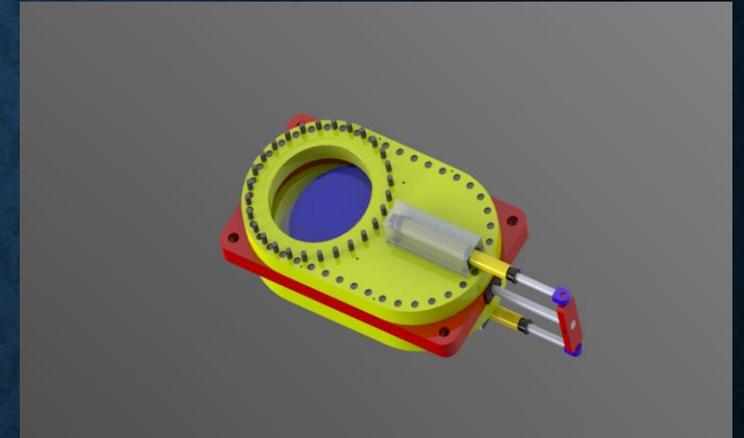
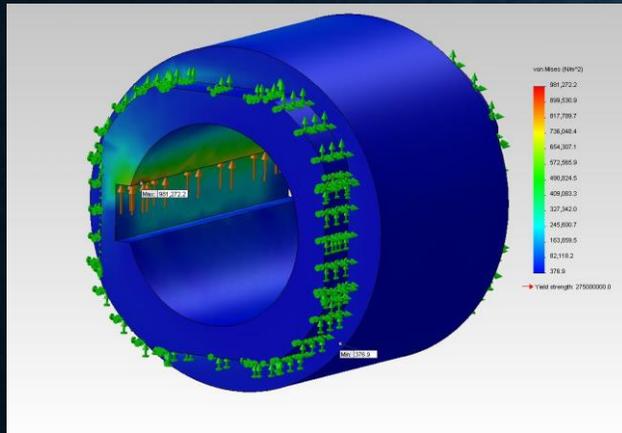
Manufacturing Division



Research & Development

We have an in-house design facility for all forms of Research & Development with precision engineering, full manufacture and large scale fabrication capabilities.

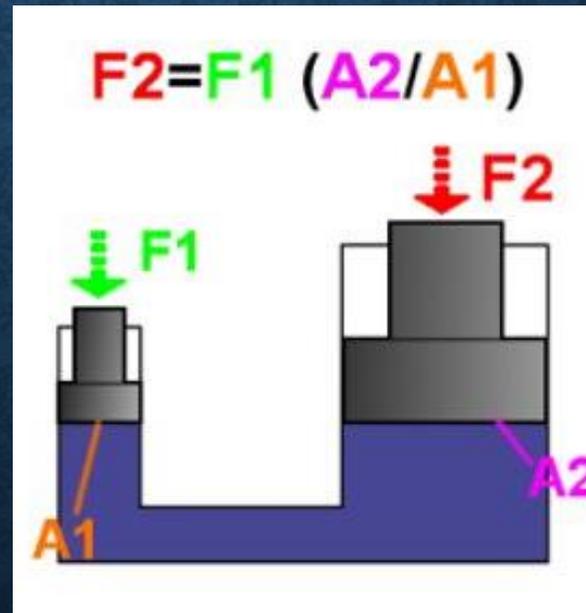
We use state of the art design software like Solidworks with flow simulation and fluid dynamics as well as infinite analysis



Training – Pipeline, Hydraulics and Valves

Hydra-Valve can offer training programs tailored to your company's individual needs. This may be to allow you to meet the needs of regulators or health, safety and environment requirements.

Empower your company & workforce with new skills and capabilities, saving you money whilst boosting efficiency and maximising profit.



PMI are a Specialist Service Provider to the Gas, Oil, Water and Petrochemical Industries.

Gas

Operational Areas include— UK & International Off-Shore, On Shore, Transmission, Distribution, Industrial & Commercial and Downstream.

Water

Operational Areas include— UK & International

Oil

Operational Areas include— UK & International Off-Shore, On Shore,

Petro-Chemical

Operational Areas include— UK & International

PMI Capabilities

Pipeline Emergency Response - 24/7/365, from initial damage assessment and measurement through to Final Repair, including Intervention for UK & Overseas.

Pipeline Replacement & Rehabilitation:- Tight Fit Lining, Bursting, Cleaning, CCTV, Slip Lining, Insertion etc.

Pipeline Maintenance - OLI - including Epoxy Shells, Clockspring, Technowrap Pig Tracking, Pipeline Assessment, Planning Management & Operational Support.

Pipeline Intervention - Steel Systems up to 100 bar Operating Pressure, Polyethylene, Hot Taps, Stopple, Iris, Bag Stops, Saddles, Tees , Valves.

Specialist Connections - Steel Hot Taps upto 100 bar Operating Pressure. 90" Pipe diameter, Grouted Tee Technology and Large Diameter Polyethylene Work.

Local Gas Networks: - Install Pipeline, Test & Commission

Pressure Reducing Stations: - Transmission & Distribution. Above & Below ground - Supply Install Commission Maintain. Data Logging, Pressure Logging, Pressure Profiling.

Metering Stations - Industrial & Commercial - Supply, Install, Commission, Maintain - Pressure Reducing & Metering Stations upto 70 Bar Operating Pressure.

Metering Services - Installation, Isolations, Exchanges, Volume Correctors, Convertors, Isolation Relays, Chatterbox`s , Data Logging, Pressure Logging, Automated Meter Reading. Meter Asset Management.

Pressure Testing - For Steel, HDPE & MDPE. Hydrostatic, Pneumatic. APT - Advanced Acoustic Pressure Testing. De-Watering & Drying.

Downstream Services - All Gas related work downstream of Fiscal Meter - Including Installation , Testing, Purging; Secondary Metering, Energy Management Systems, etc.

General Maintenance - including Breakdown, Planned & Condition Monitoring Programmes - Equipment includes: Pressure Reducing Stations, Metering Stations, Station Upgrades, Gas Holder Stations, Caustic Dosing, Filtering Stations, Regulators, Governors, Valves, Water Bath Heaters, Relief Valves, Slam Shuts, Network Pipe Purging, Pipeline Maintenance.

Technical & Professional Consultancy - Technical Pipeline Expertise, Specialist PE Consultancy, Project Management, Procedure Writing, Facilitation, Best Practice, Risk Management, Environmental Consultancy.

Our aim is to provide our customer with quick, cost effective, efficient and quality solutions to their pipeline problems, whilst ensuring the safety of our customers, the public and our employees.

Gas Safe Registered 553067

ISO 9001 : 2000

ISO 14001 : 2004

Lloyds GIRS - Gas Infrastructure Registration Scheme

CCCR

CNRB

Specialist Hot Welding

Specialist Iris Stops

Specialist Large Diameter Branch Saddles

Specialist Stopples Connections

CCTV inspections on depressurised, or live mains operating at low pressure.

The latest in camera technology with image processing, recording and camera location. This top quality pipe cruiser system is ideal for pipeline inspections and measurement, especially in hazardous environments.

Benefits:

- u Allows the inspection of pipelines with diameters ranging from 150-1200mm
- u Up to 500 metres of reach and high load capacity of up to 300kg
- u High resolution survey images
- u Pan and rotate optics provide excellent colour results directly onto the integral digital video recorder.
- u Can be fitted with different cameras to meet a variety of requirements:

FTR80CX TV Zoom Camera:

- u 360° rotating camera head
- u Highly compact camera
- u Optical zoom 10x digital zoom, 4x remote controlled focus
- u Stainless steel housing
- u Depth rating: 0.5m

VSCE150X Multidirectional Electrical Trolley:

- u 6 wheel skid steerable
- u Backwards black and white TV camera with infrared lights
- u Can be used with the SIMCO module (real-time deflection measurement)
- u Bronze and stainless steel housing
- u Depth rating in water: 5m



Hot Tapping and Line Stopping Services

Our service centres in the UK & Dubai are equipped with a wide range of line stopping and drilling equipment, designed to reduce down time or shutdowns.

We offer a fast and reliable response to your enquiries and hold stocks of pipeline fittings to suit client requirements. This service is particularly useful in emergency situations.

We can do under pressure hot taps into pipelines, tanks or blind flanges. (carbon steel or stainless steel)

Our plugging equipment includes hinged plugging heads, Using a sealing element, various elements materials are available on request, sizes from 3" to 60" diameter.

We also have a range of low pressure 12 bar plugging Heads called the Power Stop suitable for lines 3/4" inch through to 6" including 3" and 5".



Hot Tapping

Hot Tapping

Hot Tapping or pressure tapping is the method of making a connection to existing pipelines or vessels while the existing system is under pressure.

This method employs a drilling or tapping machine and a full bore valve and either a nozzle or a full encirclement fitting welded to the existing pressurised system.

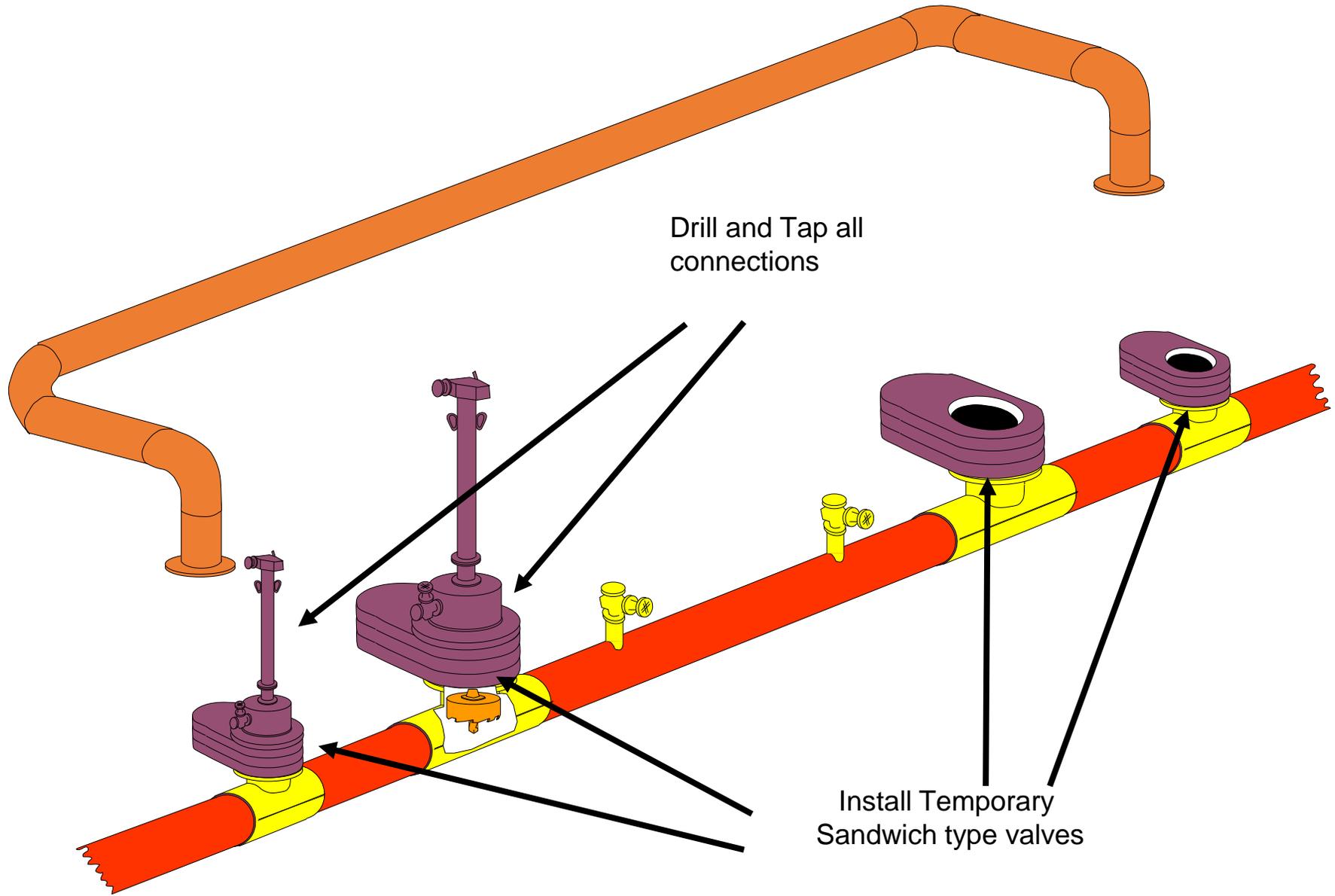
The drilling machine, generally consists of a telescoping boring bar mechanically driven by our specially designed gear box which advances a cutting tool.

A necessary element in the hot tap procedure is the full bore valve (however if the client decides that the line is to be depressurised a valve is not required).

If a valve is required this allows the tapping machine to be removed after the cutting operation, flange ratings are from 150lb through 900lb ANSI ratings.

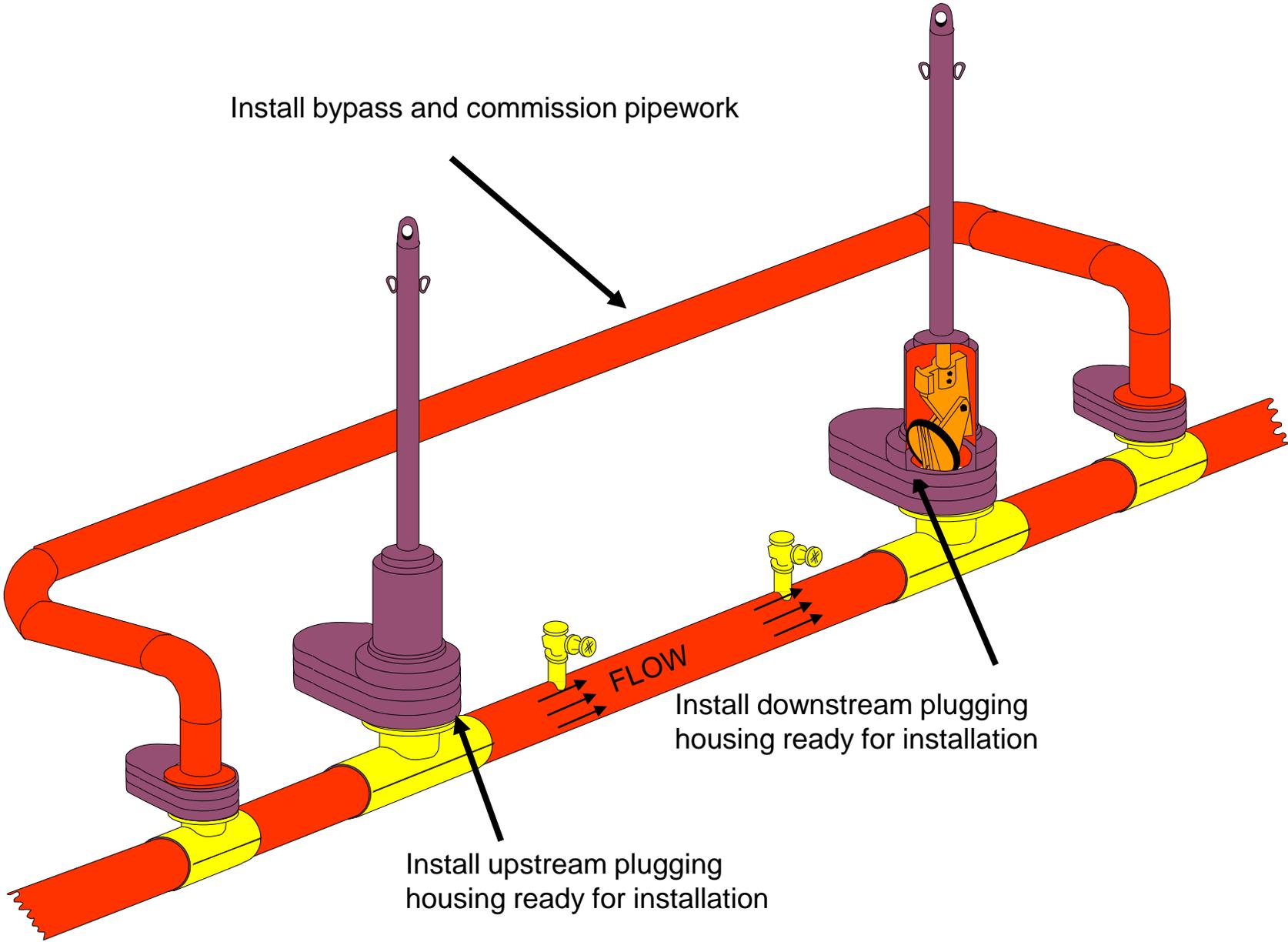
The following animation demonstrates the methodology behind Hot Tapping

Line Stopping Animation



Drill and Tap all connections

Install Temporary Sandwich type valves

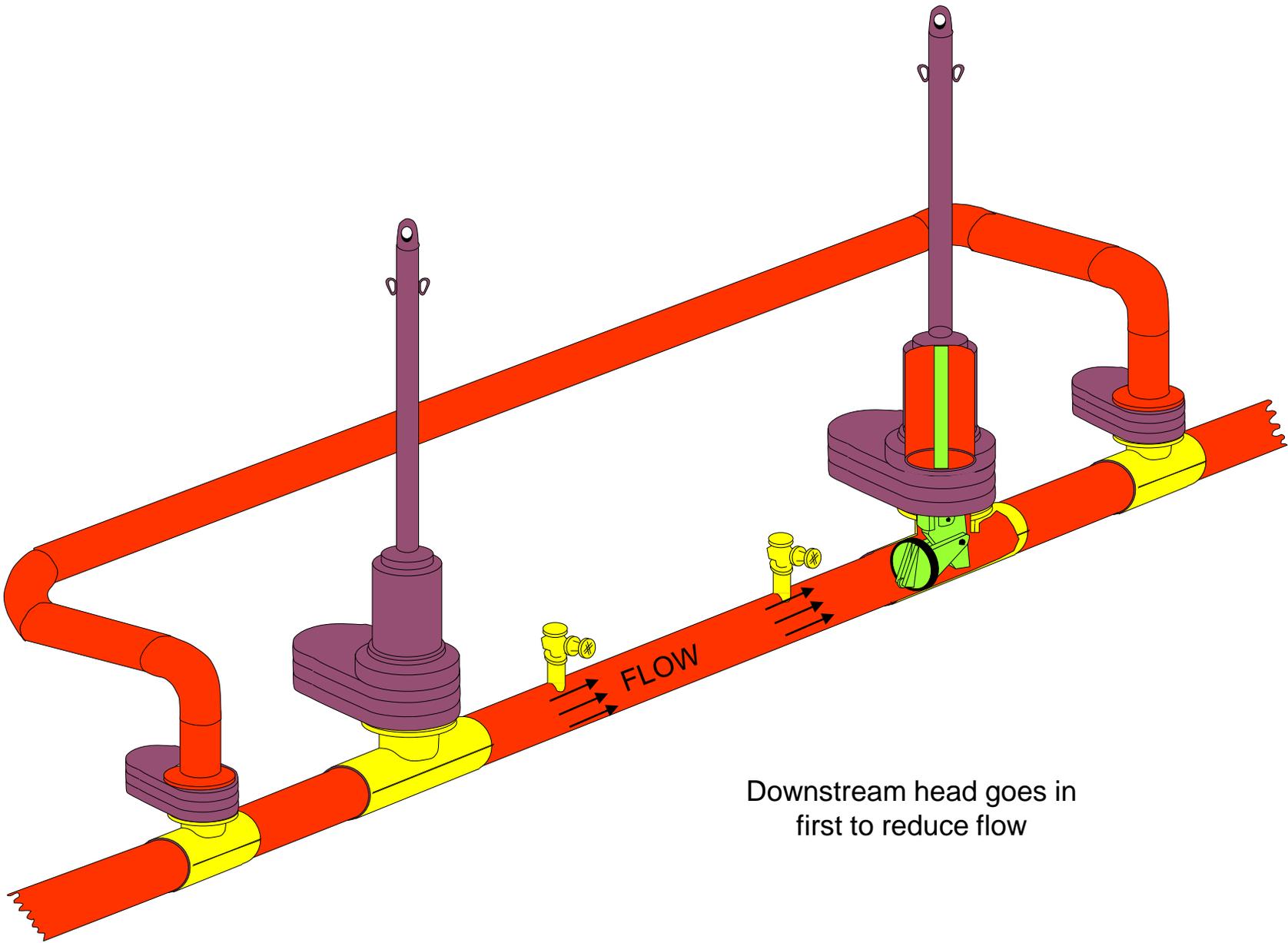


Install bypass and commission pipework

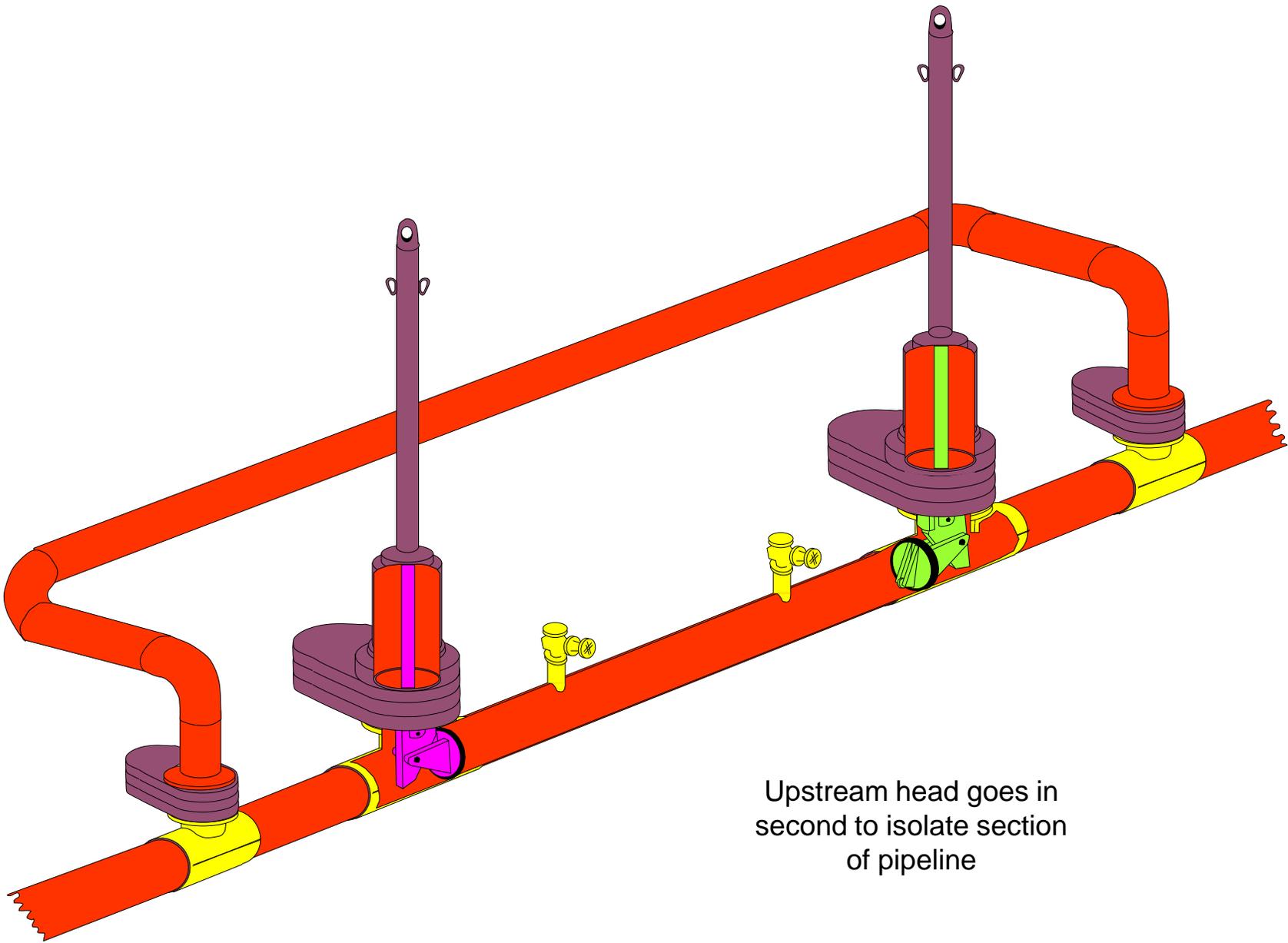
Install upstream plugging housing ready for installation

Install downstream plugging housing ready for installation

FLOW

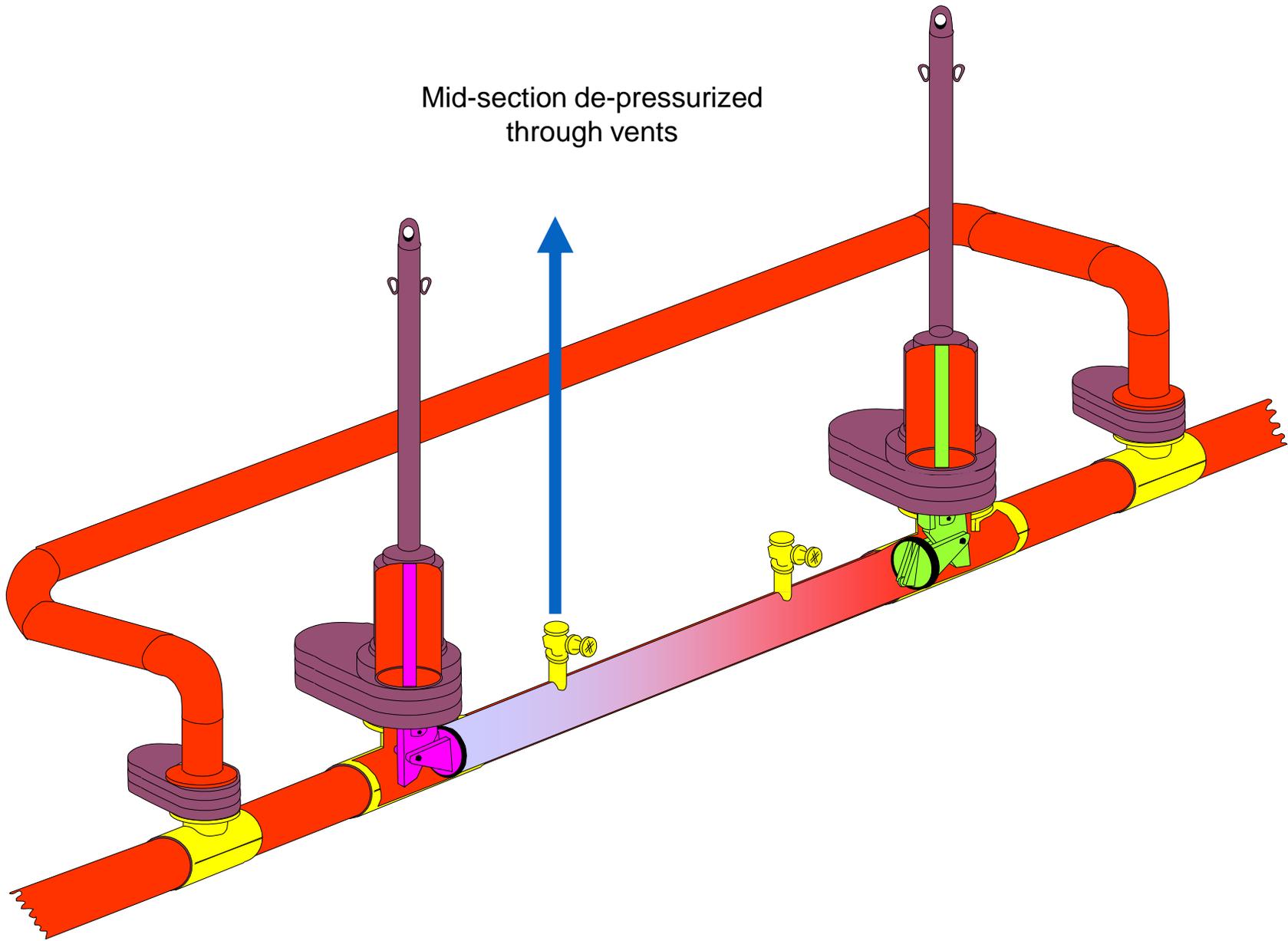


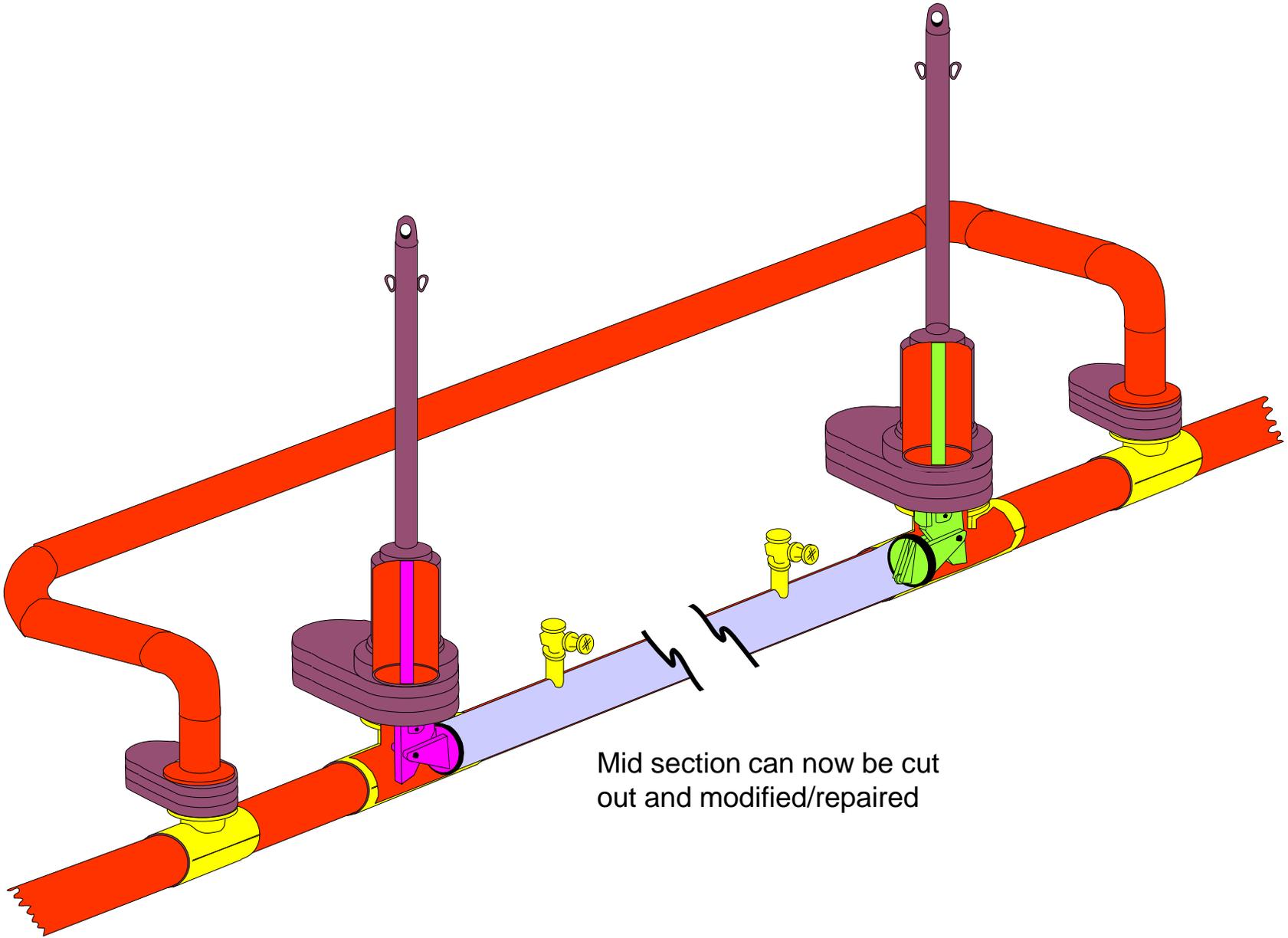
Downstream head goes in
first to reduce flow



Upstream head goes in
second to isolate section
of pipeline

Mid-section de-pressurized
through vents



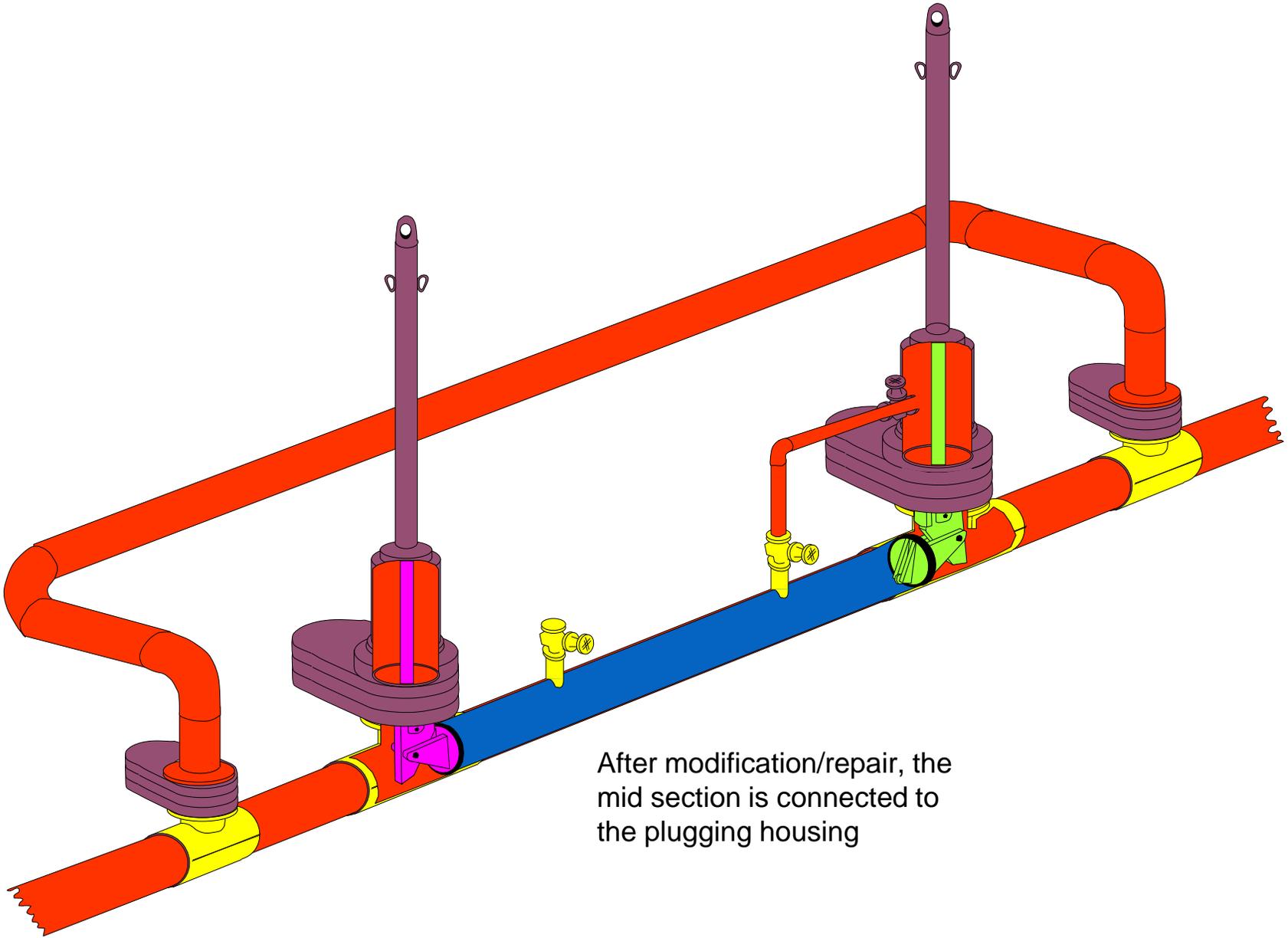


Mid section can now be cut out and modified/repaired

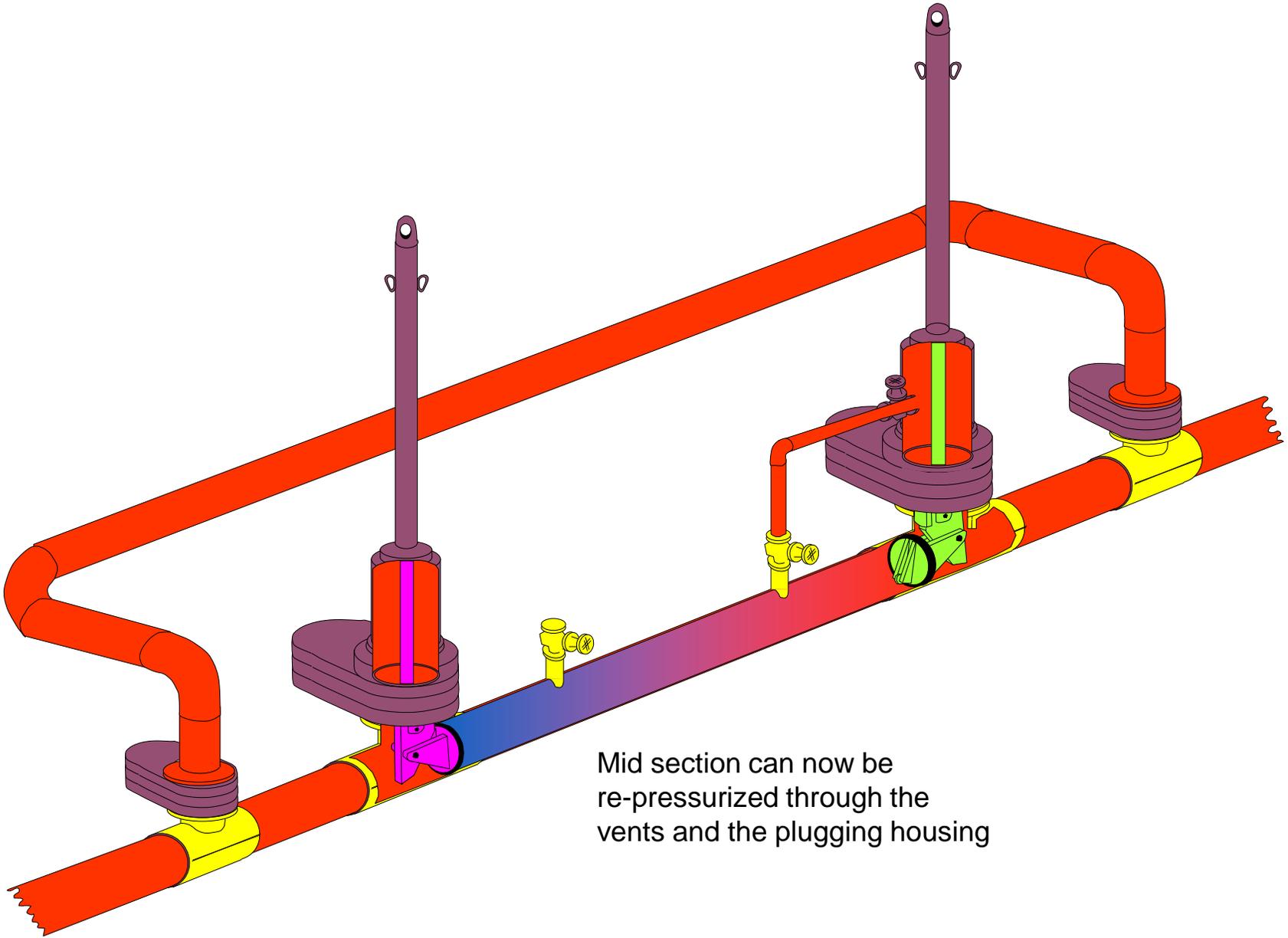




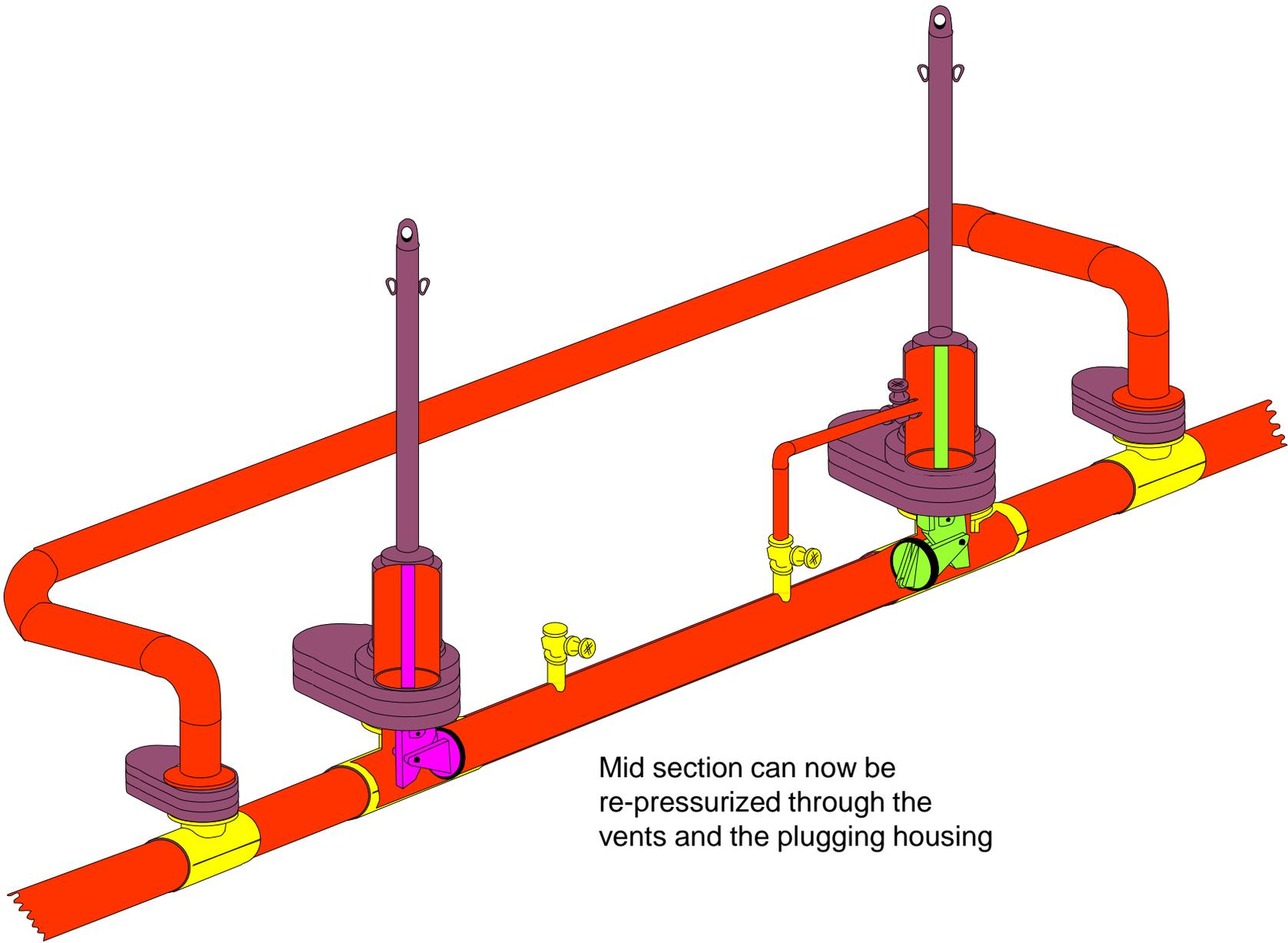




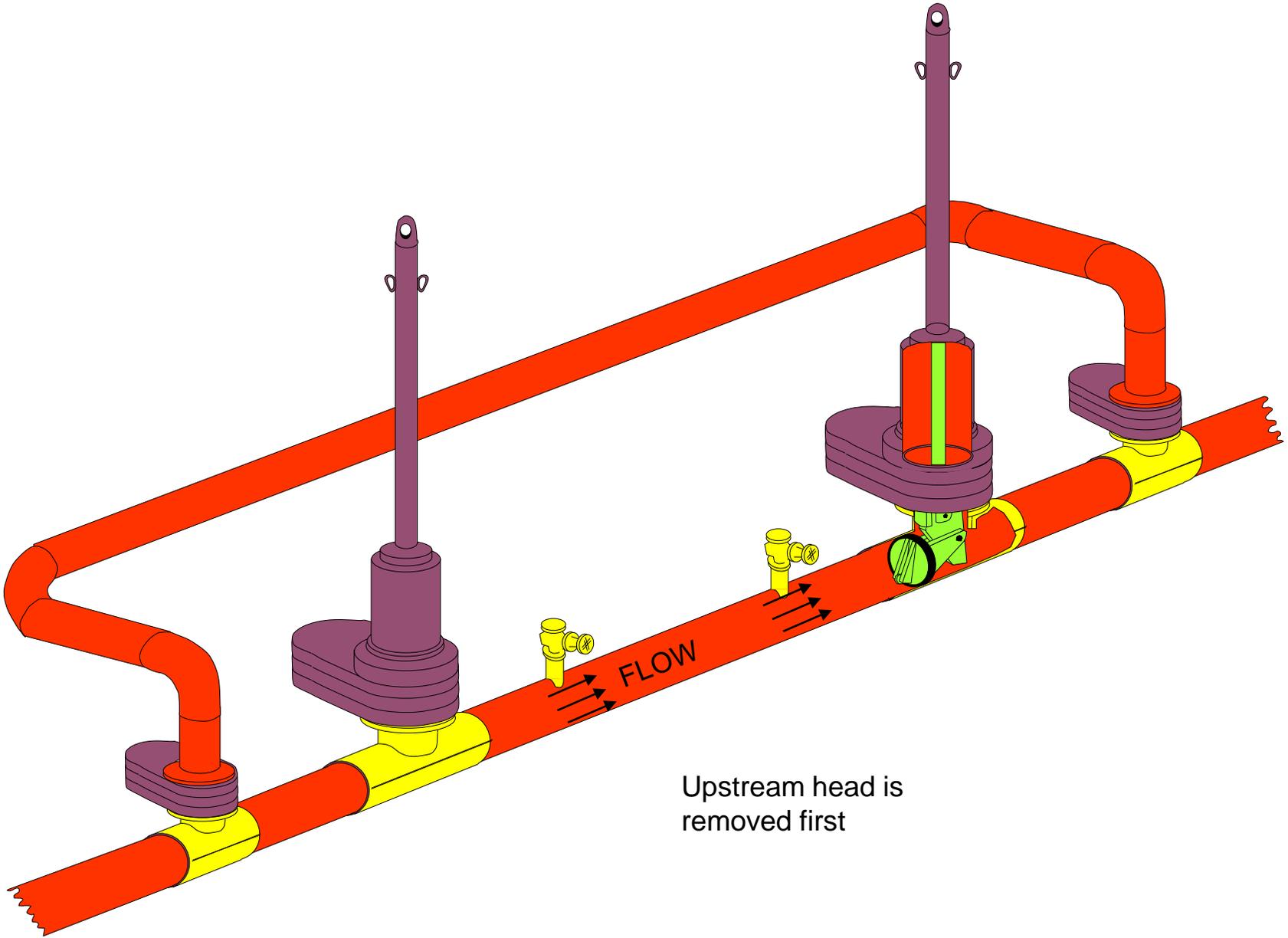
After modification/repair, the mid section is connected to the plugging housing



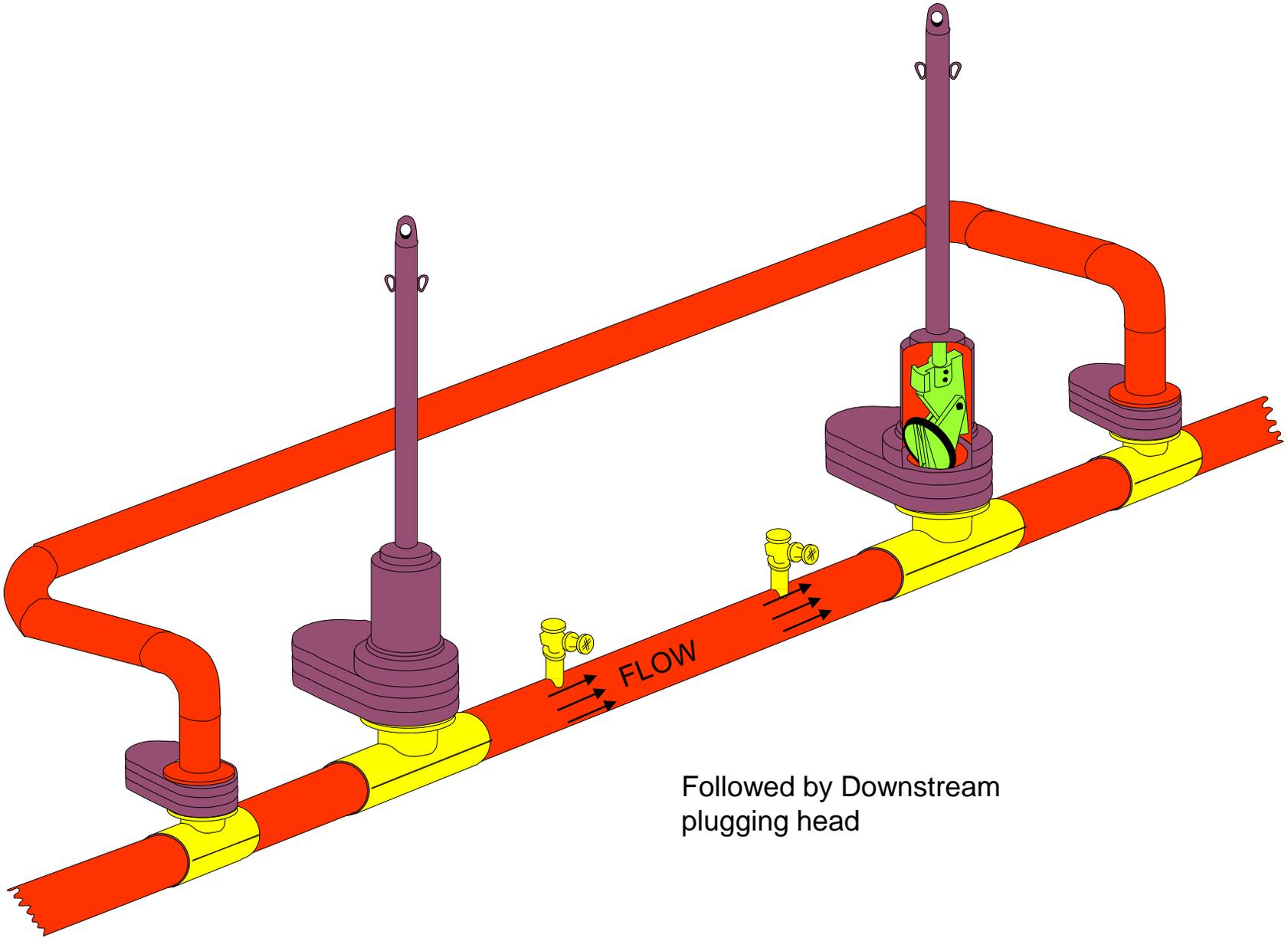
Mid section can now be re-pressurized through the vents and the plugging housing



Mid section can now be re-pressurized through the vents and the plugging housing

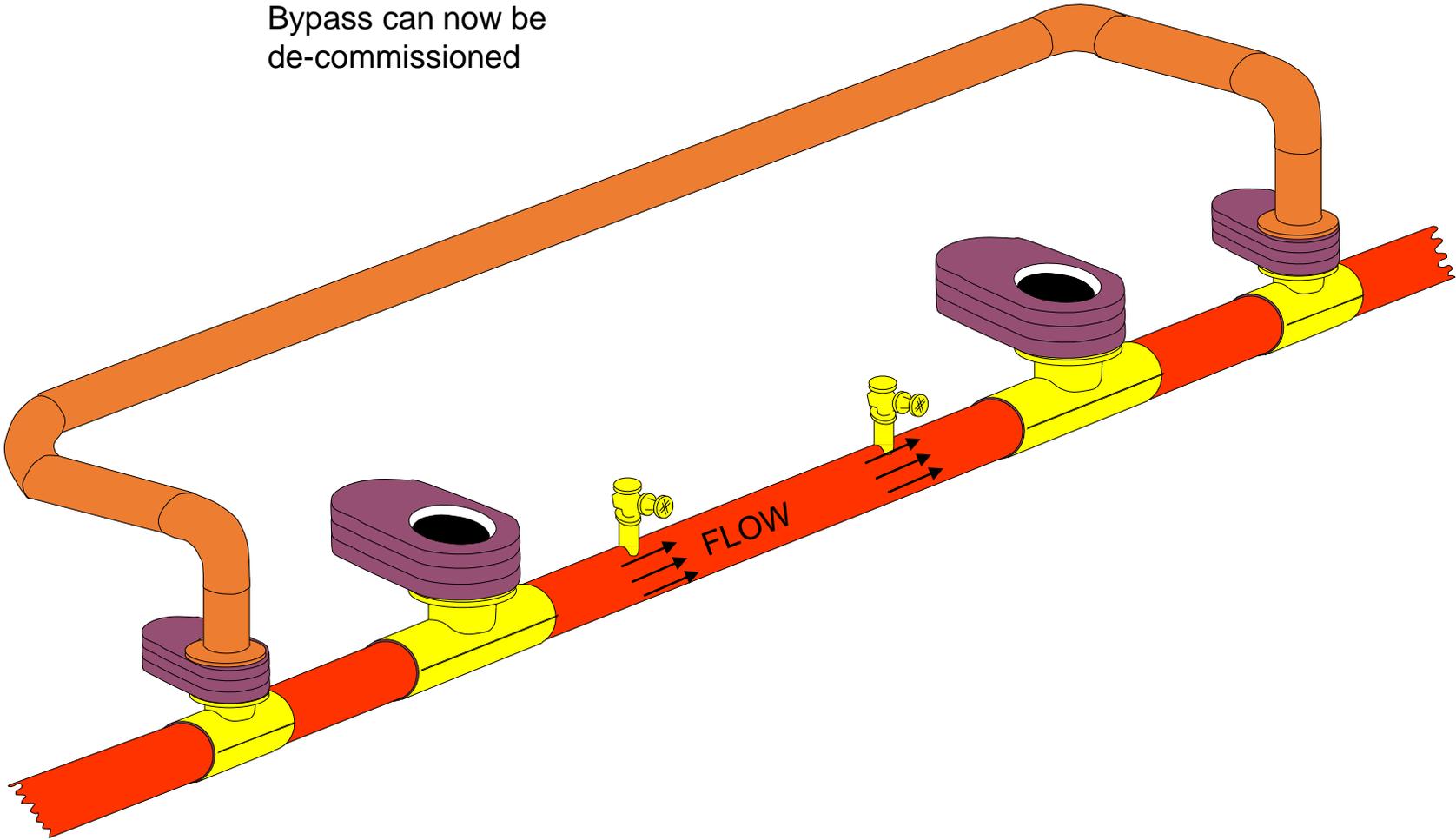


Upstream head is removed first

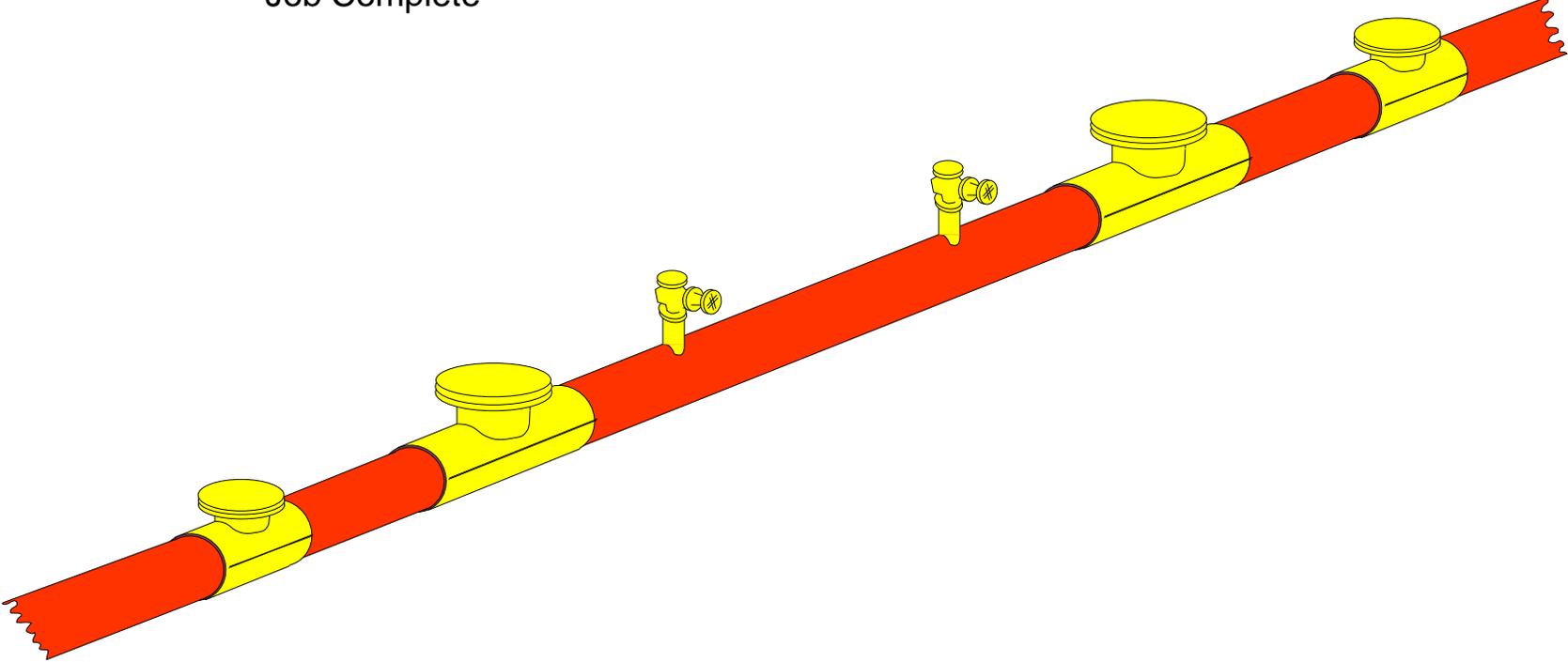


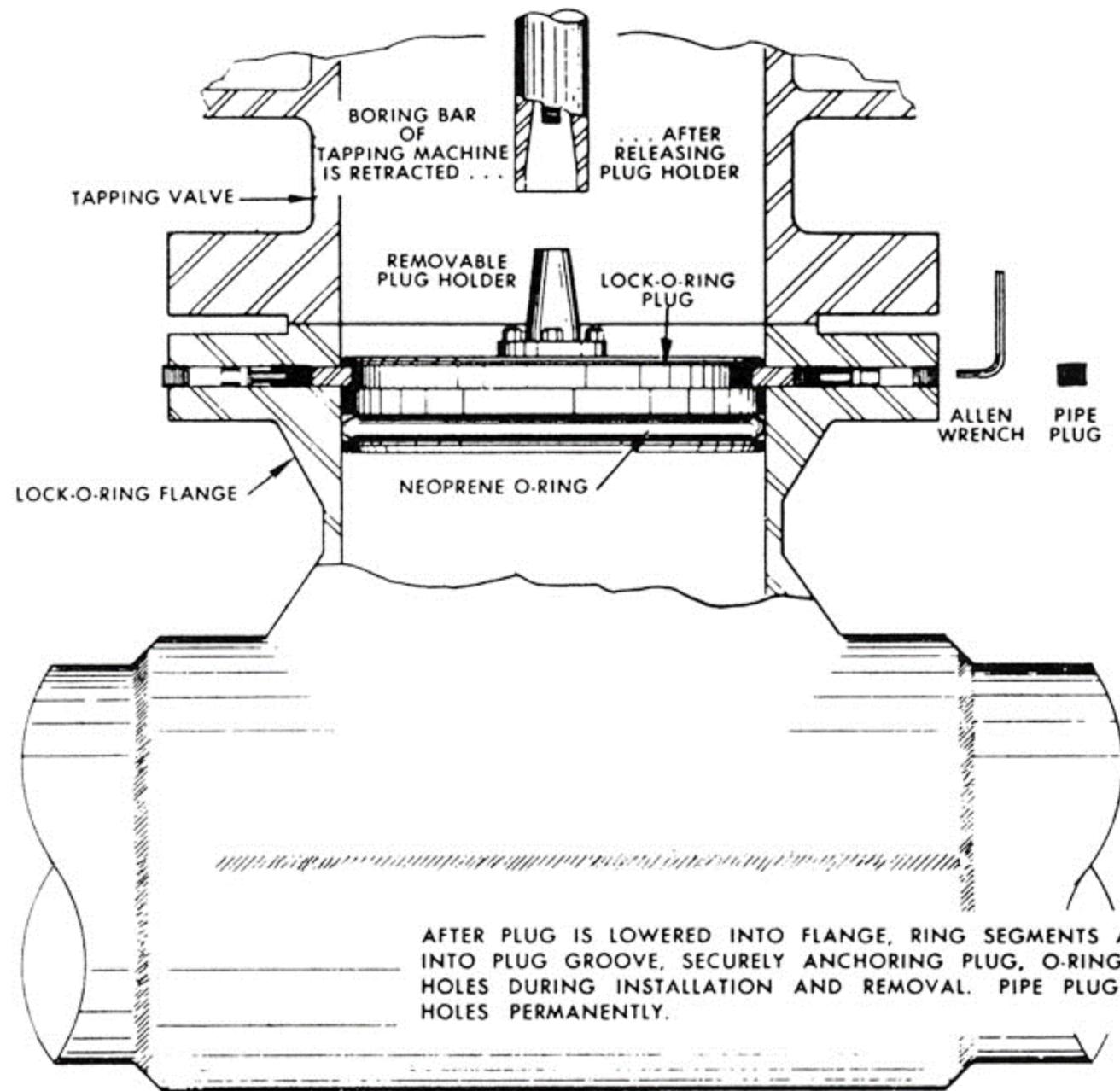
Followed by Downstream
plugging head

Bypass can now be de-commissioned



All fittings blanked off -
Job Complete





AFTER PLUG IS LOWERED INTO FLANGE, RING SEGMENTS ARE ADVANCED INTO PLUG GROOVE, SECURELY ANCHORING PLUG, O-RING SEALS SCREW HOLES DURING INSTALLATION AND REMOVAL. PIPE PLUG SEALS SCREW HOLES PERMANENTLY.

Oil, Gas and Water Pipeline Projects

If you require any assistance on current or future pipeline projects we are in the perfect position to help you in all areas, World-Wide.

We represent the largest Civil's & Plant company in the Middle East and the UK. We are a JV supplying the largest range of "End to End", "Total Solutions", within the pipeline sector. We specialise in Oil, Gas and Water Pipeline installations. We would appreciate the opportunity to visit you and discuss what we are capable of as a company in terms of supporting the development of Oil, Gas and water pipeline installations in any location. We have bases of operation in Dubai, Saudi Arabia and the UK.

We are much more than just a pipeline company and possess extensive knowledge and experience of developing infrastructure systems around the world.

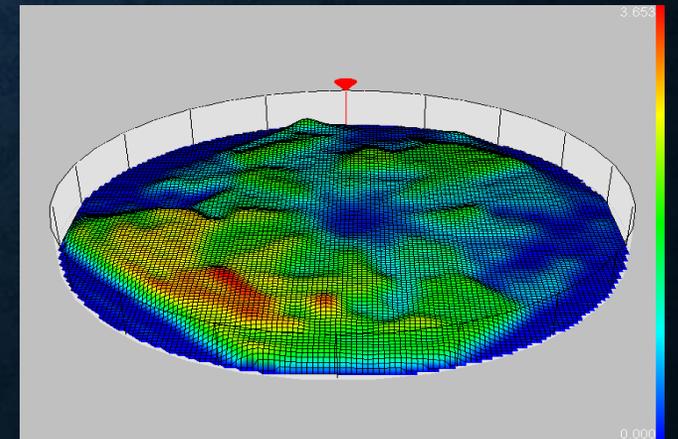
Our services are extensive including everything from new field development to construction and installation of refineries. We have laid more than 20,000km of large capacity pipelines as well as the development of road networks, Power Plant supply and installations, Desalination plant supply and installations. We conduct directional drilling, tunnelling, bridge building and much more.

We are establishing a brand new state of the art manufacturing facility in Dubai to support our existing facilities in the UK. This will include design, manufacture and supply of all Pipeline products and services including, Line Stopping, stoppling, by-pass technology, pipeline fittings, new valves, valve refurbishment and new installations. We also have extensive testing facilities and equipment, including the World-Wide patent and I.P. for Advanced Pipeline Testing, (APT), and Acoustic Advanced Pipeline Testing, (AAPT). This is the fastest leak detection in the world for newly commissioned pipelines, meaning finished pipelines can be put into commission the same day without the lengthy test procedures currently used.

Tank & Pipeline Projects

We specialise in "always on technology" meaning we can supply many services without the requirement for isolations. Our objective is to maintain flow at all times. We are also experts on the management of tank systems and tank farm storage. Again we specialise in tank scanning using the very latest state of the art 3D techniques. We can identify sludge accumulation to less than 1mm density and offer "LIVE" removal and separation of the hydro-carbons/oil from the sludge. This offers huge benefits and cost savings to the customer as tank isolation is not required.

We have experience of working with most of the major Oil, Gas and Water companies world-wide. We have saved them major costs and downtime using our company. We would like the opportunity to meet with you and discuss the benefits to your company that we can bring. We have a substantial portfolio of successfully completed projects to offer you giving you the peace of mind you deserve.



Technology solutions for the Tank Storage and Pipeline industries

SPECIALISTS IN STORAGE TANK MANAGEMENT

- T-Type Tank Sludge Mapping Surveys
 - With correlation using thermal imaging.
- Tank Floor scanning (SLOFEC)
- Tank Shell and Roof corrosion mapping
- Tank Surveys (API 653 & EEMUA 159)
- Tank Shell & Roof corrosion mapping
- LRUT – GUL G3 - PIMS



T- TYPE TANK SLUDGE MAPPING SURVEYS

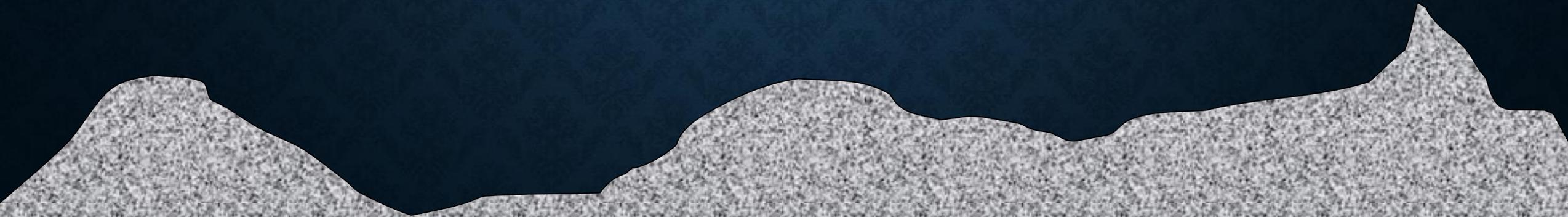
- Oceanscan background
- Relationship with Tank And Pipe
- Going Forward with T-Type
- Demonstration Partnership
- Europe, Africa, Middle East, South America, Australasia.



CRUDE OIL STORAGE TANKS

Sludge

- Settles in Bottom of Tank
- Reduces Storage Capacity
- Sludge Surface Topology Not Uniform
- Monitoring Required for Capacity Accounting
- Potential Hazard to Landing Floating Roofs



SLUDGE EVALUATION METHODS

- **Current Measurement Technology**

- Manual Dipstick
- Single Point Measurement
- Labour Intensive
- Slow Data Acquisition
- No Topology
- Inaccurate Sludge Volume Estimations

- **T-Type Acoustic Measurement Technology**

- No contact with Sludge
- Complete Sludge Surface Topology
- Accurate Sludge Volume Calculation
- Fast Data Acquisition

APPLICATIONS

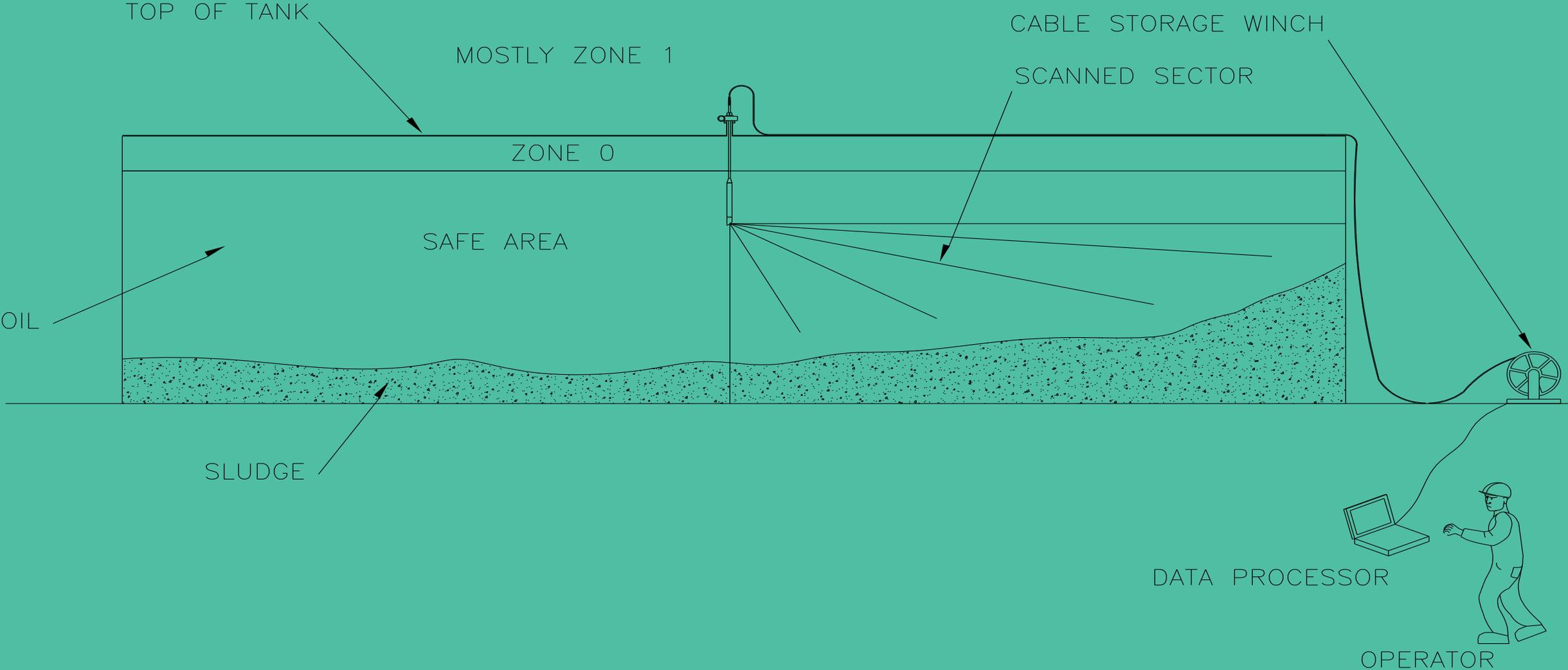
- Tank Farms



- Oil Tankers



T-TYPE OVERVIEW



THE T-TYPE INSPECTION SYSTEM



3 PART SYSTEM

- **Operator Station**

- PC based Data Acquisition
- UPS Power Supply

- **Cable Reel**

- 150m Cable
- Ex Rated Socket Interface

- **Inspection Tool**

- ATEX Certified



ATEX APPROVED INSERTION TOOL



HAZARDOUS AREA OPERATION

- **Operator Station**

- Safe Area

- **Cable Reel**

- Safe Area

- **Inspection Tool**

- Operates Immersed in Storage Tank Liquid
- ATEX Certified Zone 1



TANK DEPLOYMENT

Man Portable

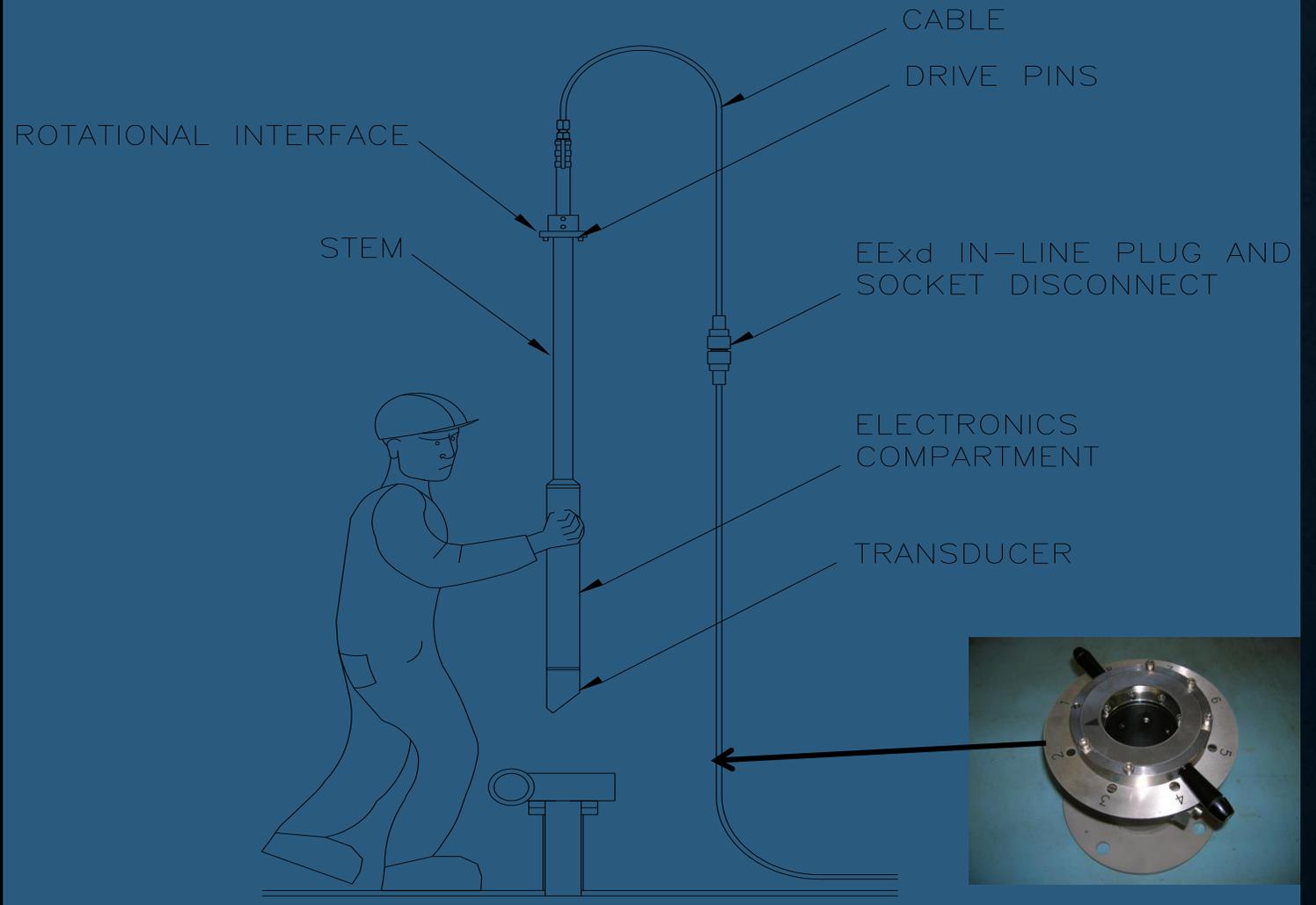
- Tool weight <50kg
- Tool Disconnects from Data/Power Cable

Tank Entry

- Enters Tank thru Nominal 5 inch I.D. Nozzle in Roof
- Single or Multiple Entry
- Height Adjusted with Stem

Mobile

- Truck Mounted Cable Reel
- Truck Mounted Operator Station



TANK DEPLOYMENT

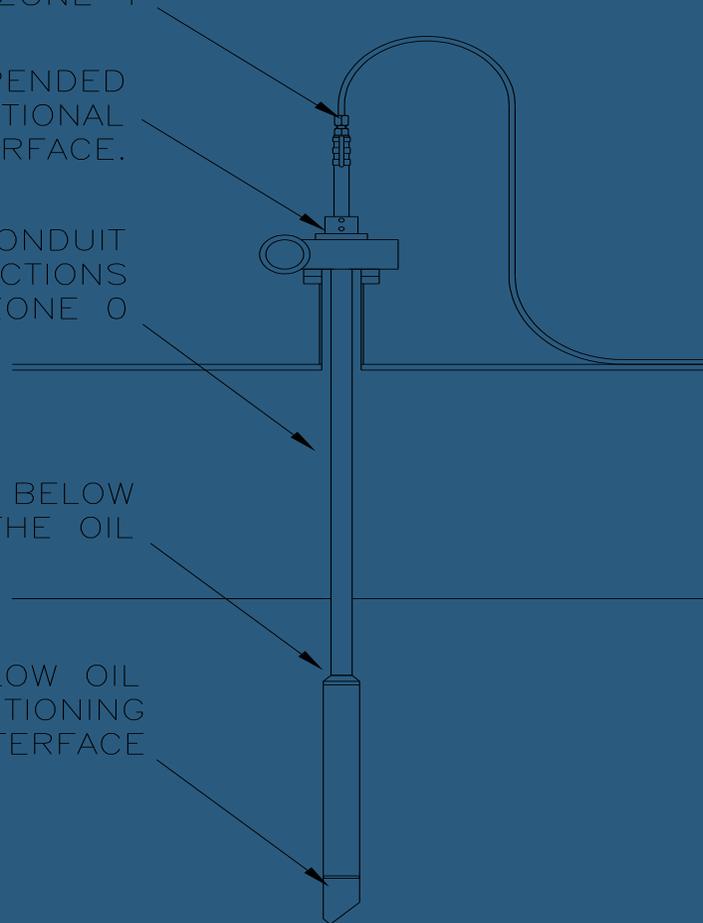
UPPER END OF STEM IS OPEN TO THE ZONE 1 AREA; INSIDE OF STEM BECOMES ZONE 1

SONAR SUSPENDED BY ROTATIONAL INTERFACE.

STEM FORMS A CONDUIT PREVENTING ANY CONNECTIONS BEING EXPOSED TO ZONE 0

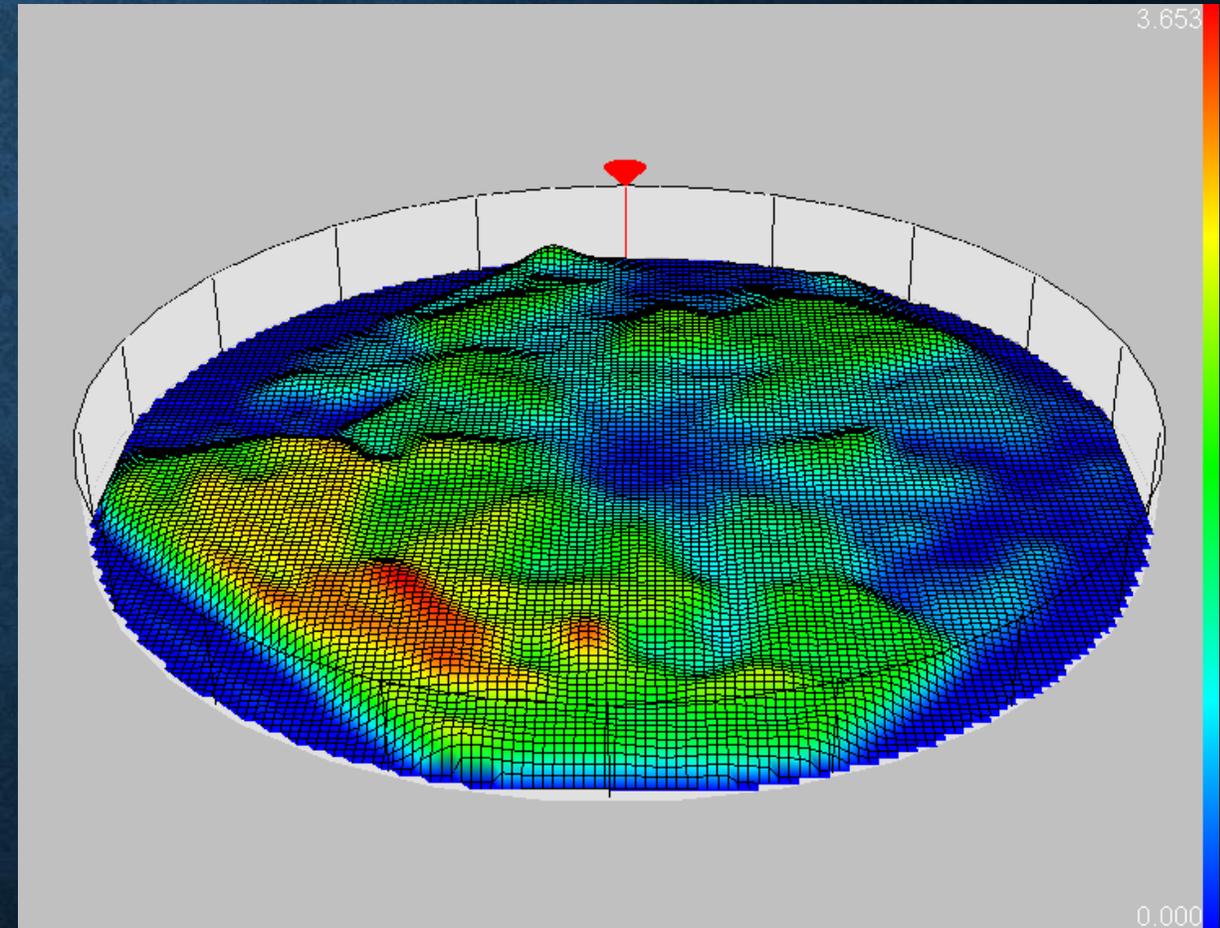
EExd CONNECTION IS BELOW THE SURFACE OF THE OIL

DEPTH BELOW OIL SET BY POSITIONING ROTATIONAL INTERFACE

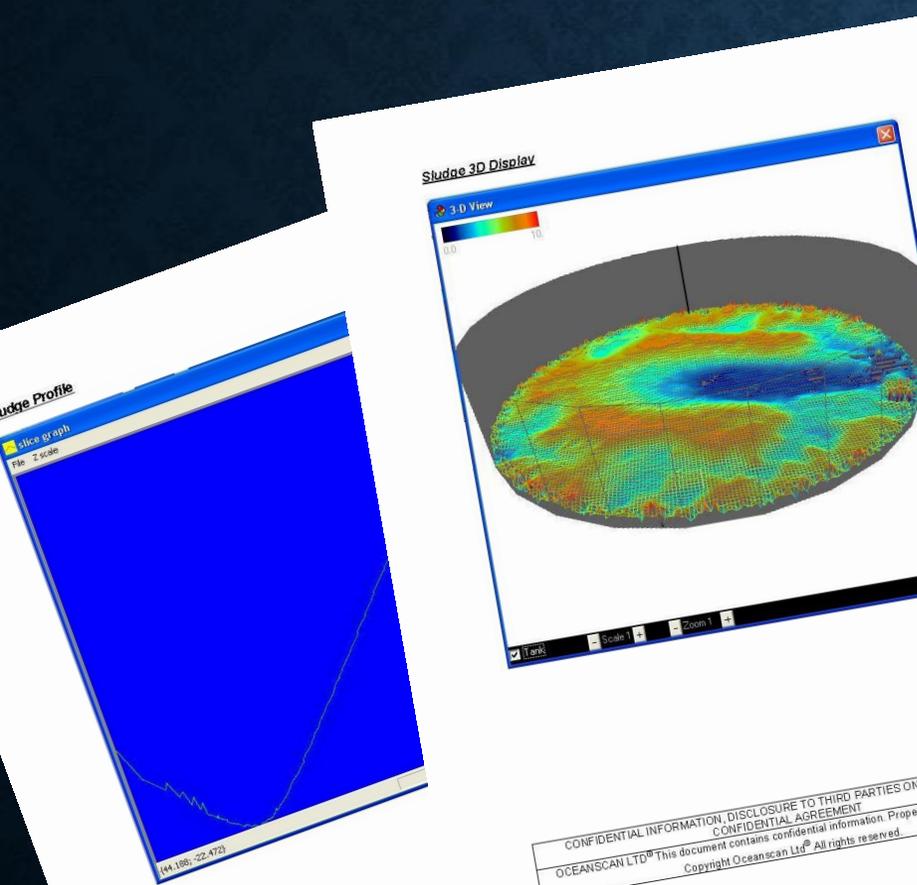


USER INTERFACE

- Sludge 3D Display
- Merged Display from Multiple Entries
- Tank Wall Mimic Shown



REPORT OUTPUT



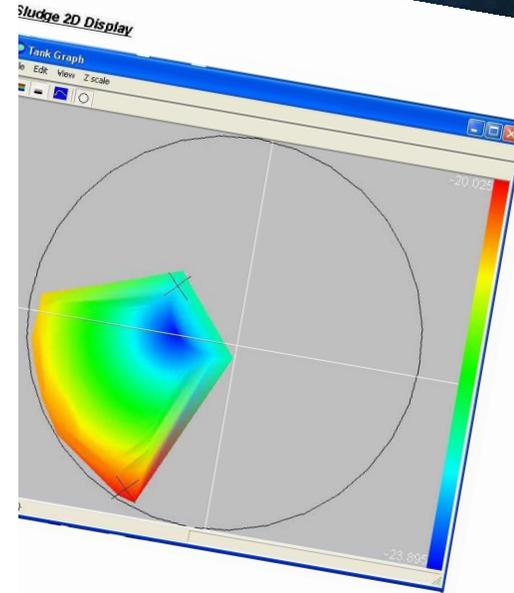
SURVEY RESULT

Location: Aberdeen

Date of Survey: 15 September 2006



Oceanscan Limited
Denmore Road
Bridge Of Don
Aberdeen AB23 8JW
United Kingdom
www.oceanscan.co.uk
sales@oceanscan.co.uk



through hole or leg 1. The survey reports are given below:

- Cone Up
- 25 (metres)
- 70 (metres)
- 2100 (metres)
- 3.34 (metres)
- 859 (metres)
- (Degrees)
- (Degrees)
- (Degrees)
- (Degrees)

(%)
cubic metres

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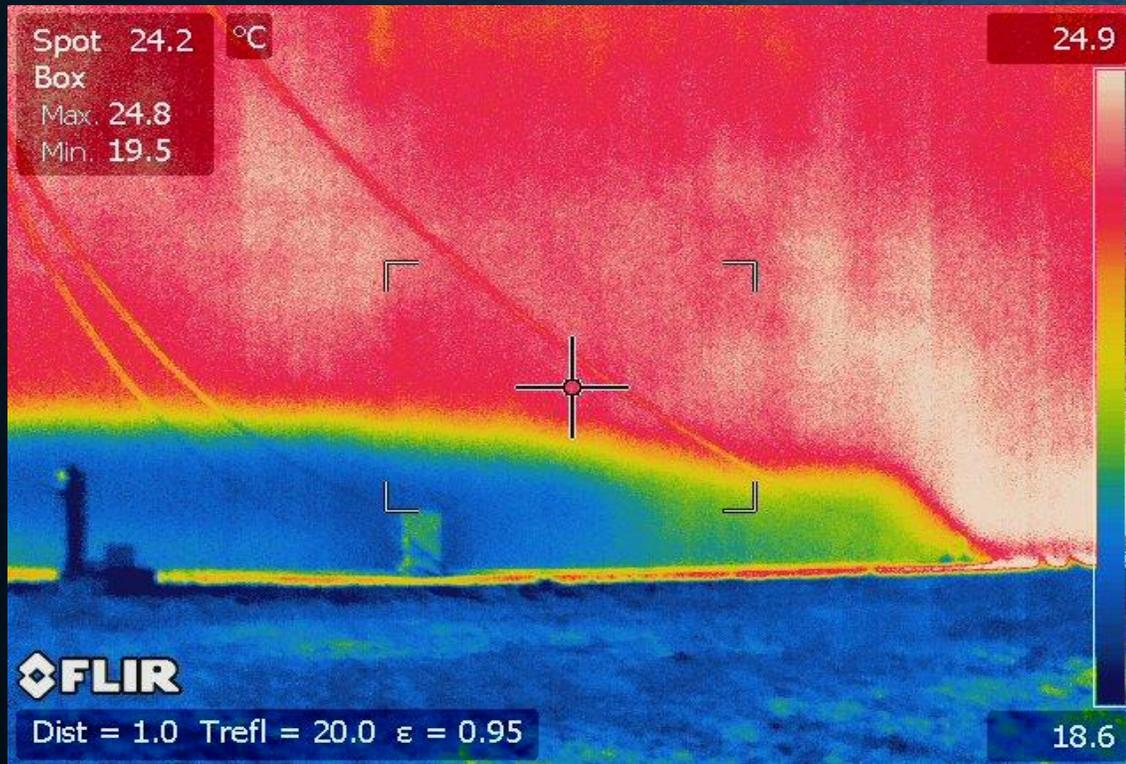
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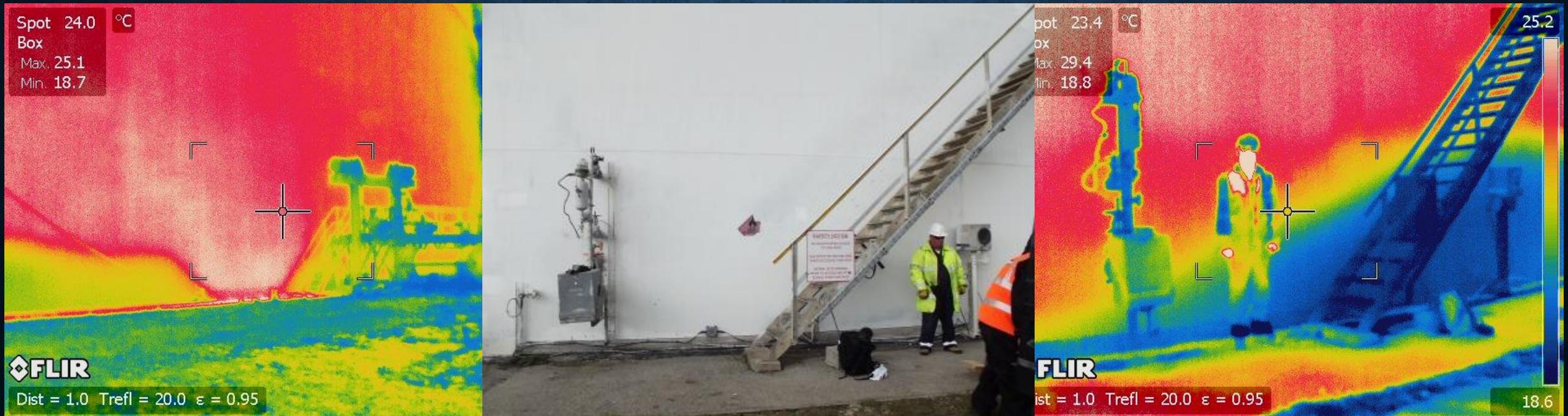
Thermal images

The difference between sludge and oil can be determined by the different colours of the thermal image. This information is used to clarify the levels of sludge that are up against the tank wall. (Oil is red, sludge is blue)



Thermal images

As the temperature of oil needs to be known in order to carry out the T-Type we can use this information as part of the data input when programing the T-Type software. The temperature of the oil in this instance is on average 24 degree C.



THE SERVICE

“To carry out sludge volumetric and 3D topology Surveys in Storage Tanks on a worldwide stage with **strategically placed partners**”.



HEALTH & SAFETY

- Risk Assessments for each tank to be inspected
- Method statements
- ATEX Zone 1 approved equipment
 - Intrinsically safe radios
 - ATEX Zone 1 Laser measuring device
- Review of client requirements
- Full PPE (flame retardant) and filtration masks where applicable.
- Vehicles fitted with “spark arrestors”.



COST BENEFITS

- Eliminates uncertainty of what volume of sludge is in a tank and its distribution. Focuses cleaning operations.
- Average tank takes 1 to 2 days to inspect with NO downtime to tank production.
- Accurate information for tank cleaning tenders.
- Accurate forecasting of recoverable hydrocarbons.



HYDROCARBON RECOVERY (LIGHT DENSITY 0.8325 / API -38.39)

CALCULATION CASE STUDY (worse case scenario)

Initial volume of sludge in tank (93m diameter tank) = 8705 m³ (T-Type)

% recoverable hydrocarbons in sludge = 75%

At 90% hydrocarbon recovery then volume of hydrocarbons recovered is 8705 x 75% x 90%

= 5,875m³

Since 1 m³ = 6.28bbl (US Oil)

= 6.28 x 5,875

= 36,895 bbl. (US Oil)

Current crude oil price (July 2013 – USD 98.00 bbl)

= 36,895 x 98

= 3,615,710.00 USD

Assuming value of recovered hydrocarbons to be 50% of market value of oil ;

Value of recovered Hydrocarbons = 50% of USD 3,615,710.00 = **USD 1,807,855.00**

OTHER TANK & PIPELINE SERVICES



LRUT – GUL G3 & PIMS

Tank And Pipe Integrity Solutions Ltd.

Westminster Business Centre, Office 5, Wellington House,
Wynyard Park, Tees Valley, ENGLAND, UK. TS22 5TB

As part of the Tank And Pipe range of services we are pleased to announce that we can now offer a full range of LRUT services. Our equipment of choice is the GUL G3 Wavemaker system with Enhanced Focusing Capability.

The GUL G3 Wavemaker Pipe Inspection system has been used in a wide variety of industrial environments and applications.

The industries where the equipment has been used include:

- refineries
- petro-chemical plants
- offshore platforms
- power plants (coal, nuclear, etc...)
- gas stations (including transmission lines)
- tank farms
- mining plants
- paper production plants
- steel plants
- food processing plants



The system is very useful the following locations:

- Sleeved Road Crossings
- Corrosion under insulation
- Wall Penetrations
- Pipe Racks
- Pipe Support Corrosion
- Road Jump Overs



Permanently Installed Monitoring System Guided Ultrasonics Ltd

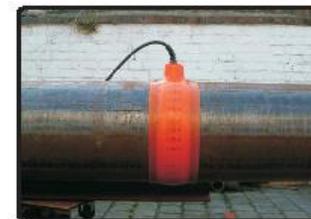
What is PIMS?

- A permanent transducer that can be installed and left on most petrochemical pipe work
- Allows data to be collected from a remote location at any time to assess pipe condition
- Encapsulated in polyurethane to protect transducer from most environments allowing results to be obtained from buried, subsea, sleeved or pipes in contaminated areas
- Gives results virtually identical to standard Wavemaker transducer rings.
- Stable over time for excellent repeatability



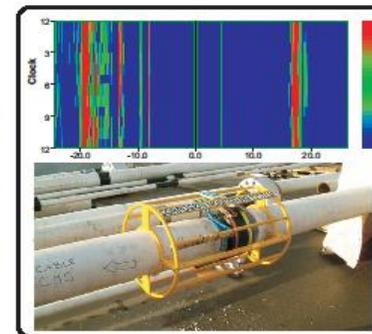
Where?

- PIMS have already been installed on around 100 buried pipes
- Pre-installed on pipe and then installed subsea and cabled back to platform (see below).
- Installed above splash zone on risers in the North Sea and offshore in South America
- Are being installed within the casing of cased road crossings
- To be installed on very cold lines so that inspection can be performed with the pipe still in service without the difficulty of ice build up.



Why install PIMS?

- Access cost for many inspections is a large proportion of the overall inspection cost
- With PIMS repeat inspection is a simple connection and data collection requiring no further access to the pipe
- Repeatability is so good that changes of less than 1% in the pipe cross section have been detected
- Transducer can be installed pipes before they are put in service allow results to be obtained from sections of pipe that would be inaccessible such as sleeved pipes
- Results are directly comparable to standard transducer rings so pipe can be tested before installing PIMS.



Result from PIMS unit (shown) installed on subsea line and cabled back to platform

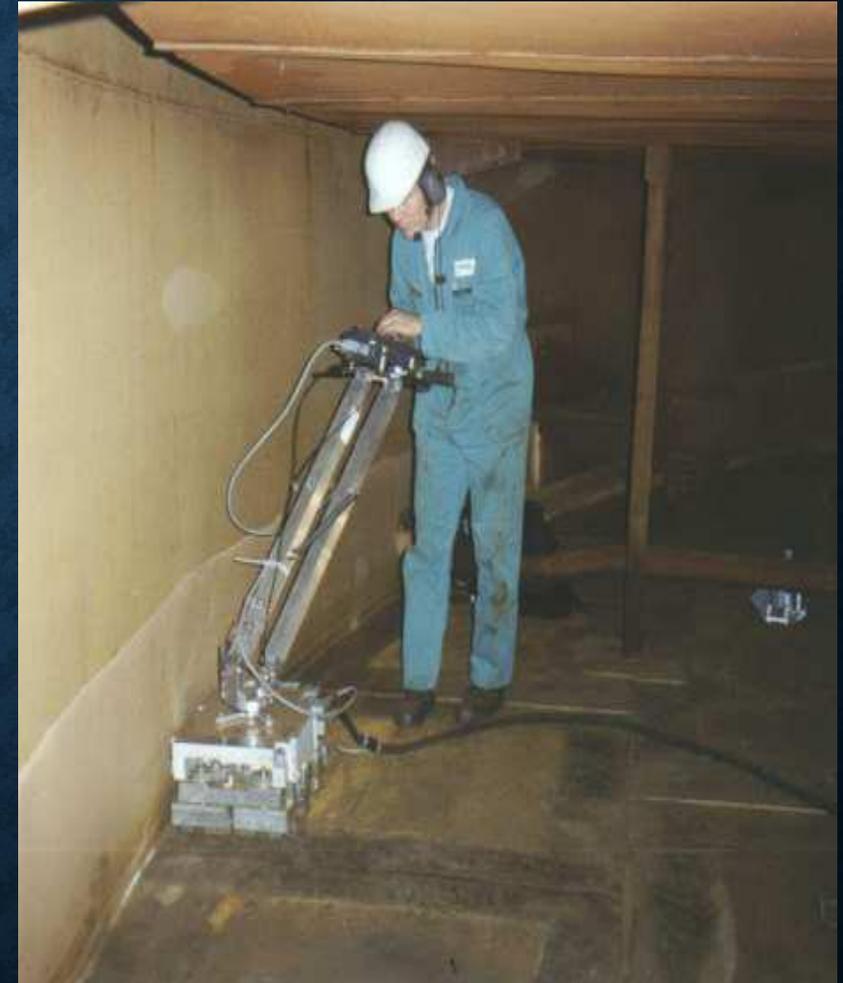
For further information or enquiries please contact us:
Email: info@guided-ultrasonics.com
Phone: +44 (0)1623 491 033

TANK FLOOR INSPECTION - SLOFEC

The SLOFEC tank floor inspection tool is based on the eddy current technique. The SLOFEC technique has significant advantages to existing MFL and UT systems.

Its superiority is based on following items:

- Applicable to wall thicknesses up to 30mm
- High detection capacity
- Detection of topside and bottom side corrosion
- Distinction between topside and bottom side corrosion
- Testing through thick coatings up to 12mm
- High inspection speed
- To couplant necessary
- Applicable to Fe and NFe materials



TANK CERTIFICATION

Tanks are generally split into several headings to help focus the inspection requirements and with this information we can also adopt the latest Inspection techniques to promote against the differing configurations and tank types.

Tanks

- Floor corrosion
- Wall corrosion
- Roof corrosion
- Internal Structural corrosion
- Misalignment of floor, roof or walls
- Weld defects / cracks
- Over pressurization / vacuum distortion
- Mechanical defects
- Stairs
- Seals
- Earthing
- Fabric Maintenance

Foundations

- Scour
- Settlement

Bunds

- Subsidence
- Concrete / steel joint failures
- Vegetation
- Animal burrows

Piping

- Internal corrosion
- External corrosion
- Misalignment / inadequate support
- Flange leakage
- Vibration
- Fabric Maintenance

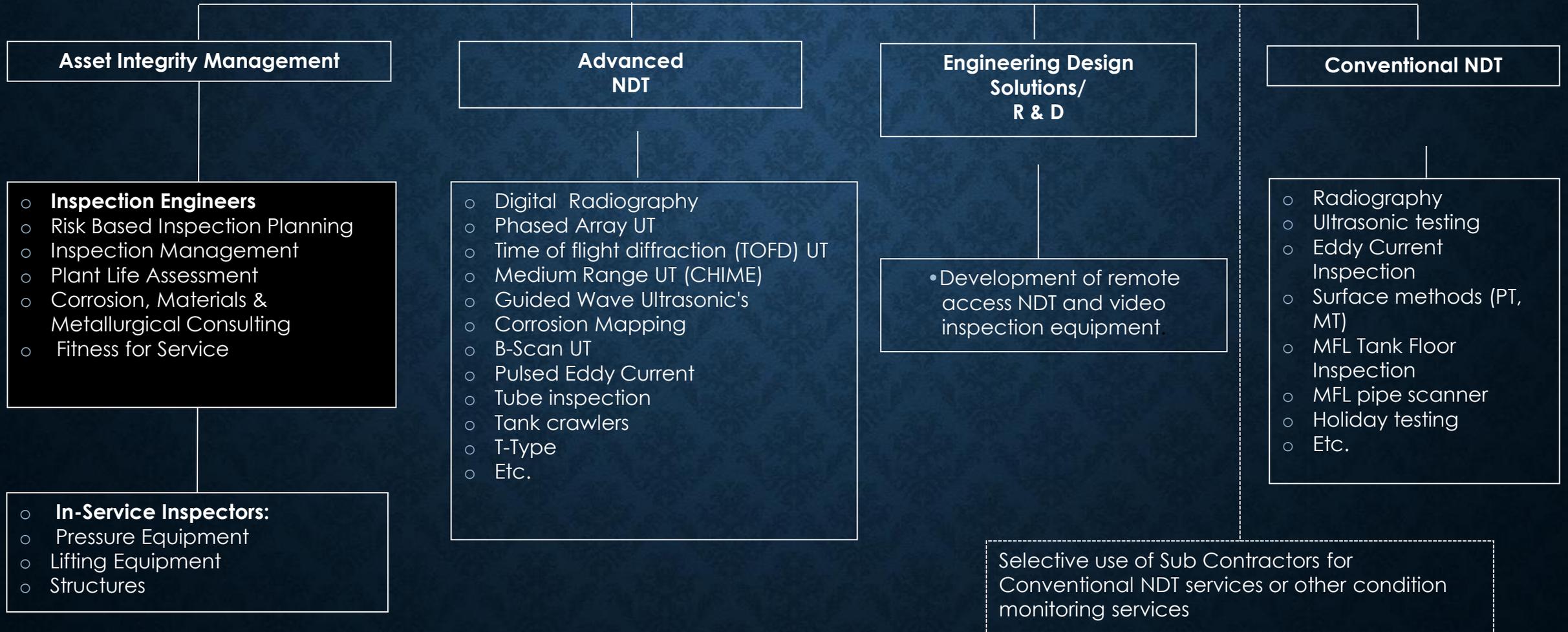
Structural supports

- Internal to tank
- External to tank
- Piping
- Fabric Maintenance

Associated equipment

- Relieving devices
- Flame arrestors
- Vents
- Bellows
- Firewater risers

Tank Management Services - Summary











Trench Breakers in Mountains KP 359



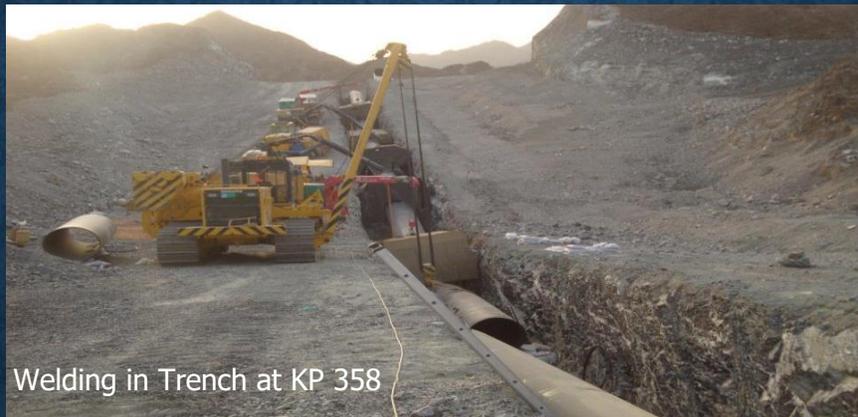
Welding at KP 350



Lowering at KP 321



Stringing at KP 350



Welding in Trench at KP 358



Lowering at KP 321



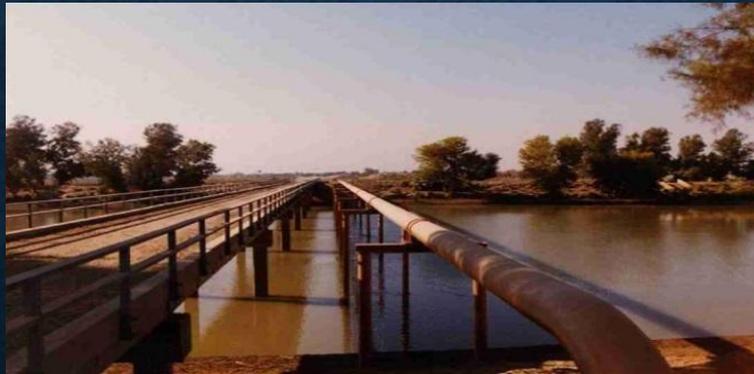
Lowering at KP 321



Joint Coating at KP 302



Lowering at KP 330



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