Pipeline Coating Removal Technology in Pipeline Repair
Pipeline Coating Removal Technology

Technology Applications

- Pipeline and Weld Seam Inspection
- NDE
- Pipeline Repair
- Brownfield Tie-in
Work Scope Overview

Phase 1: Dredging
• It’s imperative that a 2 meter hole is excavated under the pipeline on a 3:1 slope to ensure that the clamp is successfully installed.
• This depth provides a sufficient distance between the seabed and clamp seals, which limits the risk of damaging the seals during installation.

Phase 2: Pipe Surface Preparation
• The permanent clamp requires a smooth finish on the pipe prior to clamp installation.
• It’s required that all protective coating, surface rust and residue is removed prior to installation, up to 3 meters in length.
• All weld seams must be removed prior to clamp installation in order to create a seal on the section of pipe.

Phase 3: Pipe Metrology
• Straightness and ovality of the pipe are crucial to the success of the permanent clamp installation.
• Straightness gauge is required for checking the straightness of the pipe.
• A temporary clamp is installed as a hard stop, which aids in the alignment of the permanent clamp during installation.

Phase 4: Clamp Installation
• The clamp installation is best supported by 2 ROVs, MSV with heave compensated crane and Oceaneering’s permanent clamp installation frame.
• The permanent clamp installation frame allows for the safe installation of the permanent clamp onto the pipe.
Dredging

- Provide sufficient access to full pipe circumference
- Allow for a 3:1 slope in seabed
- Dredged depth needs to provide sufficient clearance for further operations
- Where a pipeline repair clamp is being installed additional clearance for clamp seals, which limits the risk of damaging the seals during installation
● 3:1 slope required for successful installation of ROV Clamp

● Approximately 350 cubes of total material to be moved for successful installation of ROV clamp

● 6” Diver Dredge will take 2.5 days vessel time

● 12” Subsea Dredge will take 1 day vessel time
Precision Dredging
Pipe Surface Preparation

- A permanent clamp requires a smooth finish on the pipe prior to clamp installation.
- It's required that all protective coating, surface rust and residue is removed prior to installation, up to 3 meters in length.
- All weld seams must be removed prior to clamp installation in order to create a seal on the section of pipe.
PCRT Operations

Video
Protective Coating Removal Tool
Protective Coating Removal Tool
PCRT Operations
Weld Seam Removal Tool

Key Features

- Capable of removing variety of coatings as well as weld seam (up to 5mm thick)
- Utilises custom milling head
- Integrates to ROV of opportunity for 24V power and hydraulics
- Tool operation via laptop / software controls topside
- Current standard designs for pipe sizes from 10” to 24”
- Can be provided with buoyancy to assist operations
Weld Seam Removal
Pipe Surface Finish
Pipe Metrology

• The straightness of the pipe is crucial to the success of the permanent clamp installation.

• Straightness gauge is required for checking the straightness of the pipe.

• A temporary clamp is installed as a hard stop, which aids in the alignment of the permanent clamp during installation.
Straightness Gauge & Depth
Permanent Clamp Installation Frame
Permanent ROV Clamp
Permanent ROV Clamp
Pipeline Inspection Equipment

Neptune Tool
- UT thickness scanner able to move radial and laterally around the pipe to map pipe thickness integrity
Pipeline Repair Tooling
Diamond Wire Saws

• Diver or ROV Operated
• 4” to 56” Diamond Wire Saws
Pipeline Repair Tooling

Pipe End Preparation Tool
- Designed to remove burrs from OD and ID of pipe after cut is made
- Ensures clamp seals are not damaged during clamp installation

Ovality Gauge
- Go-No-Go type gauge
- Used to verify pipe ovality prior to installation of a connector
- Critical to ensure proper sealing of many grip and seal type connectors
Pipeline Repair Tooling
Ancillary ROV Tooling
System Integration Tests
Pipeline Repair Track Record

ROV Tooling Pipeline Repair Track Record:

• Malaysia Pipeline Repair – 2016
• Hess Pipeline Repair – 2015
• Australia Pipeline Repair – 2015
• Australia Pipeline Repair – 2013
• Hess Pipeline Repair ROV Tooling Suite – 2011
• Perdido Oil Export Connection Tooling Suite - 2009
• Williams Pipeline Repair ROV Tooling Suite - 2007
• Mars Pipeline Repair ROV Tooling Suite - 2006
Questions?

Thank you for your attention