

Society for Underwater Technology Middle East Branch

Emergency Pipeline Repair Systems (EPRS)

An overview of the tools and methods available for the
on-bottom repair of rigid pipelines



Tuesday 13 December 2022

09:00 - 15:30 at Khalifa University, SAN Campus and
Dolphin Energy KIZAD

Presenter: Mr. Nick Kaars Sijpesteijn, Business Development Manager – Oceaneering International, Inc.



SUT-ME EPRS Mechanical Solutions

Presented by: Oceaneering International

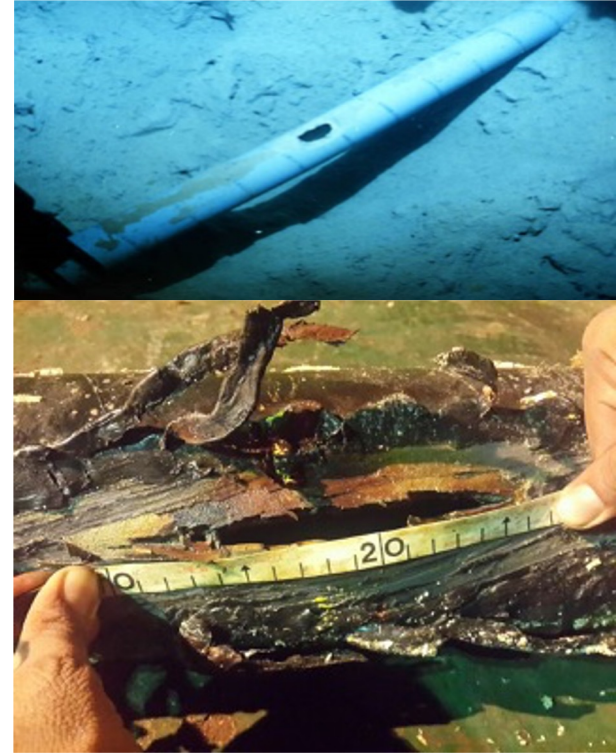
Presenter: Nick Kaars-Sijpesteijn

Agenda

- Clamp repair in shallow water
- Spool piece repair in shallow water
- Hot Tapping for line-stop or tie-in

Subsea Pipeline Repairs

- **Repair Methods:** Mechanical, Welded, Wrapped
- **Local Repair (Mechanical):**
Repair Clamp installed on a localized damaged section of the pipe (e.g. pin hole , corrosion, dent, etc.)
- **Major Repair (Mechanical):**
Section of the pipe is cut away and replaced with a spool piece & repair connectors on both sides
- **Shallow Water Repair:**
Up to 300m/1,000 ft – Diver Executed
- **Deep Water Repair:**
Beyond 300m/1,000 ft – ROV Executed



Mechanical Pipeline Repair - Benefits

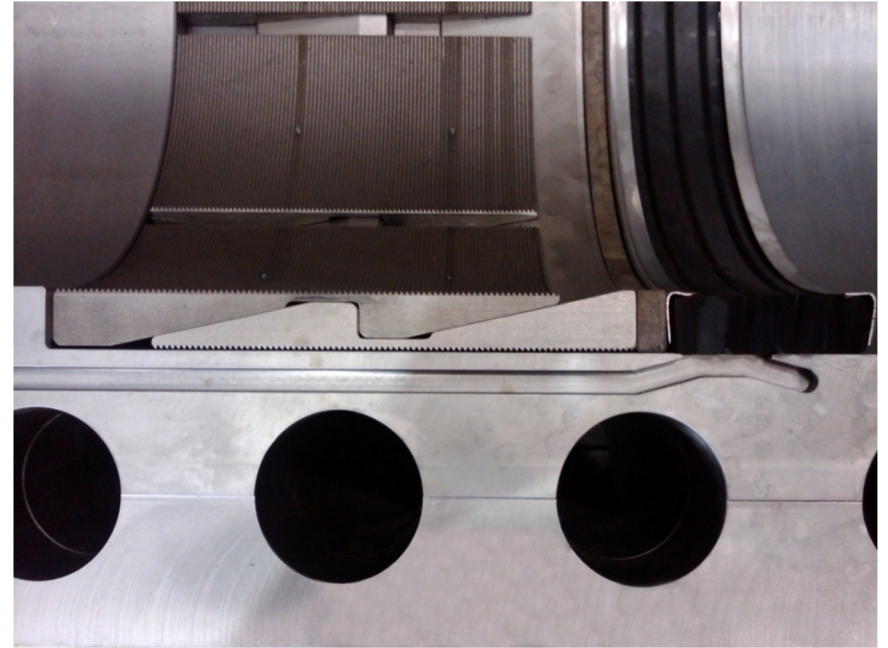
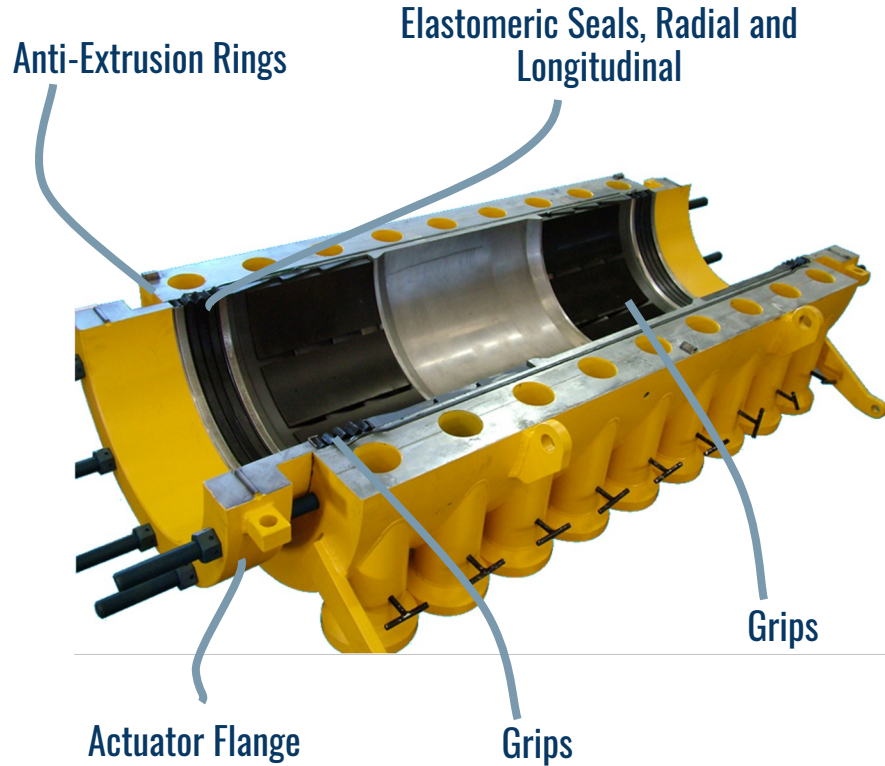
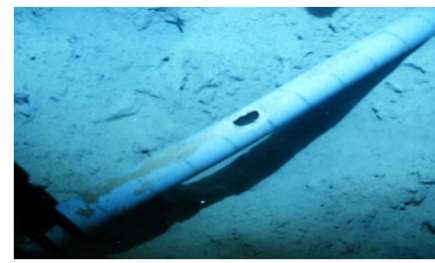
- Withstand full pipeline axial, bending and torsion loads while maintaining full pressure integrity
- No welding is required
- Suitable for both Diver and ROV assisted operations
- Remediates Health, Safety and Environmental concerns
- Quick installation

Structural Repair Clamp (local repairs)

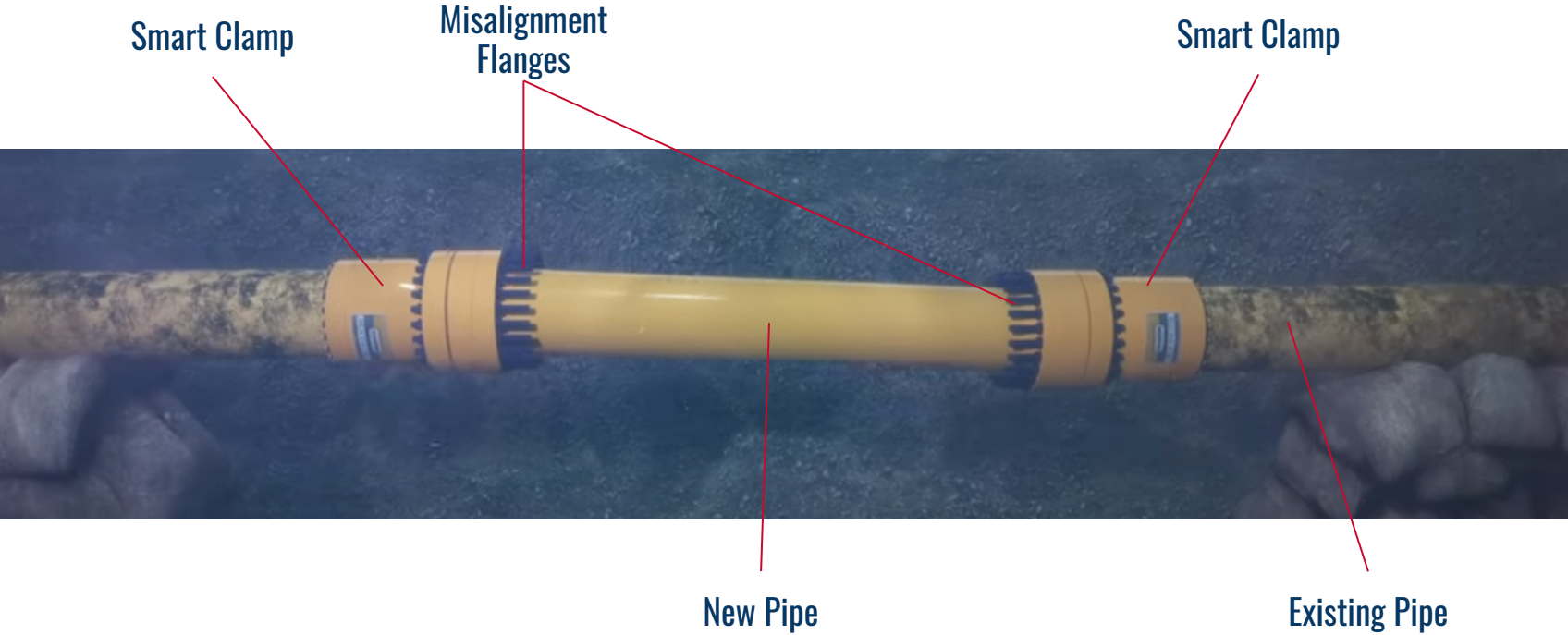


42" 3000psi Full Structural Clamp

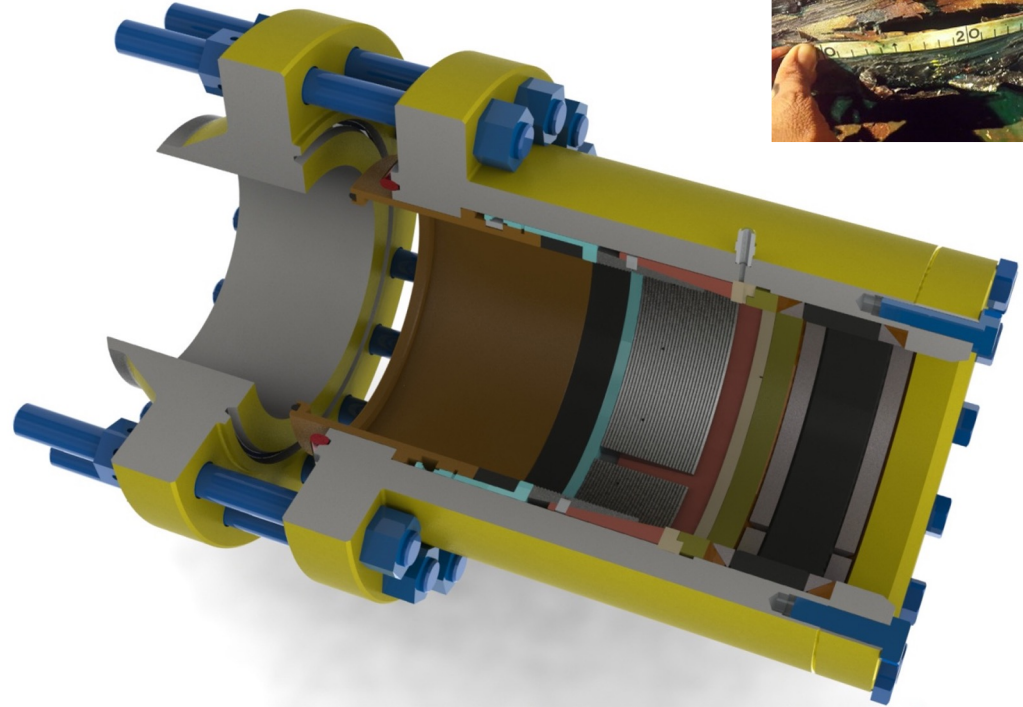
Structural Repair Clamp (local repairs)



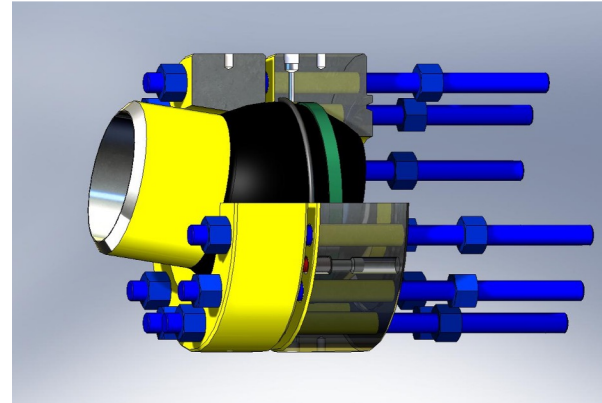
Spool Piece Repair - Smart Flange Connector (major)



Spool Piece Repair - Smart Flange Connector (major)



Misalignment Flange (BCON)





Damage found on subsea pipe

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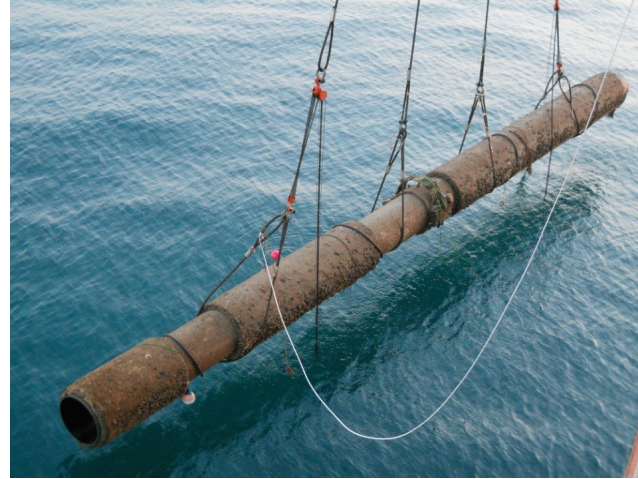
OCEANEERING®

42" MAIN OIL LINE: SUBSEA ON-BOTTOM SPOOL PIECE REPAIR USING SMART FLANGE PLUS CONNECTORS



PIPE CUTTING TOOL (DIAMOND WIRE CUTTER)
BEING PREPARED FOR SUBSEA DEPLOYMENT

42" MAIN OIL LINE: SUBSEA ON-BOTTOM SPOOL PIECE REPAIR USING SMART FLANGE PLUS CONNECTORS



CUTTING & REMOVAL OF DAMAGED SECTION OF 42"
SUBSEA PIPELINE

42" MAIN OIL LINE: SUBSEA ON-BOTTOM SPOOL PIECE REPAIR USING SMART FLANGE PLUS CONNECTORS



SPOOL PIECE REPAIR FABRICATION

42" MAIN OIL LINE: SUBSEA ON-BOTTOM SPOOL PIECE REPAIR USING SMART FLANGE PLUS CONNECTORS



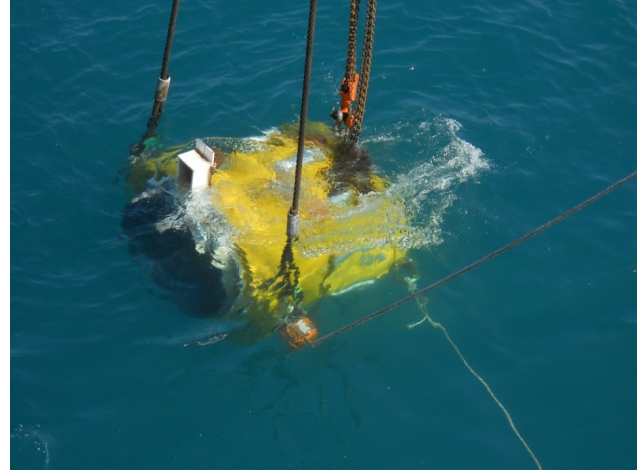
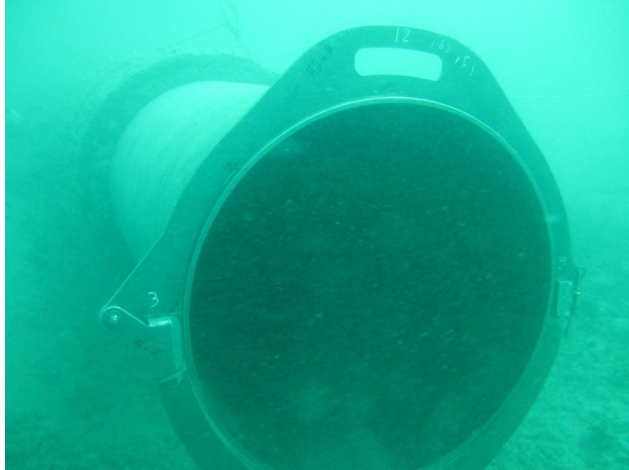
CONNECTORS BEING PREPARED FOR SUBSEA DEPLOYMENT

42" MAIN OIL LINE: SUBSEA ON-BOTTOM SPOOL PIECE REPAIR USING SMART FLANGE PLUS CONNECTORS



CONNECTORS BEING DEPLOYED SUBSEA

42" MAIN OIL LINE: SUBSEA ON-BOTTOM SPOOL PIECE REPAIR USING SMART FLANGE PLUS CONNECTORS



PIPE IS CHECKED FOR OVALITY USING A PIPE SIZING RING & CONNECTORS ARE DEPLOYED SUBSEA

42" MAIN OIL LINE: SUBSEA ON-BOTTOM SPOOL PIECE REPAIR USING SMART FLANGE PLUS CONNECTORS



NEW FABRICATED
SPOOL PIECE IS
BEING DEPLOYED
SUBSEA



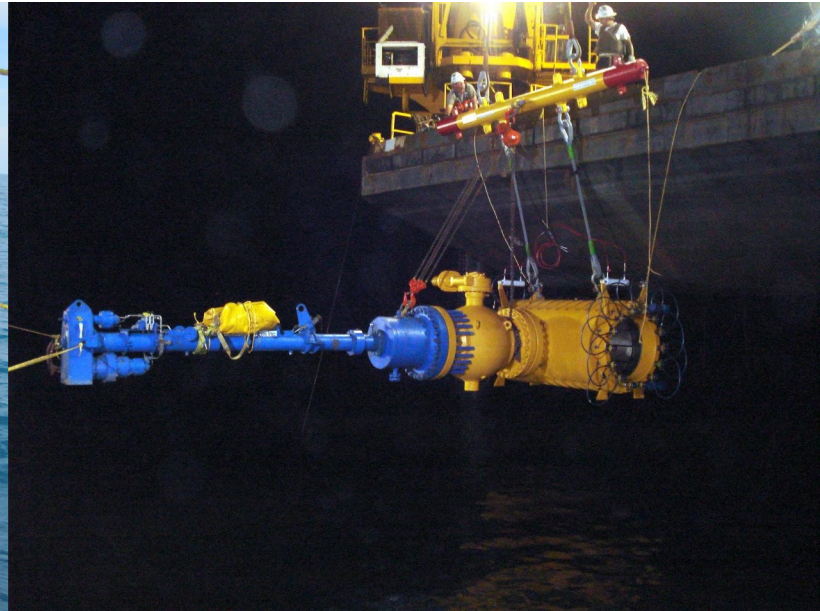
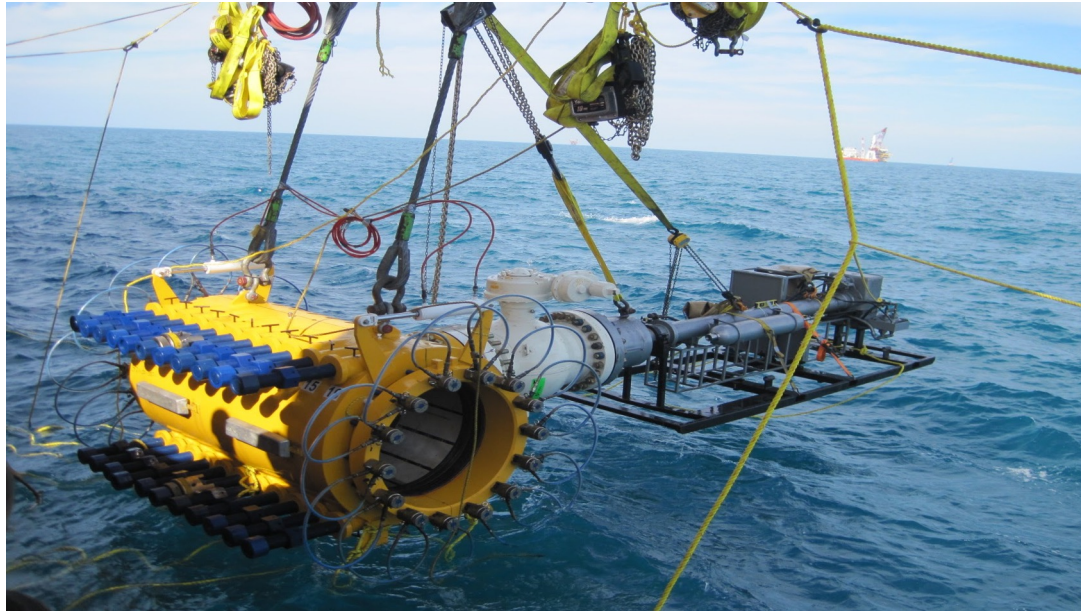
Hot Tapping

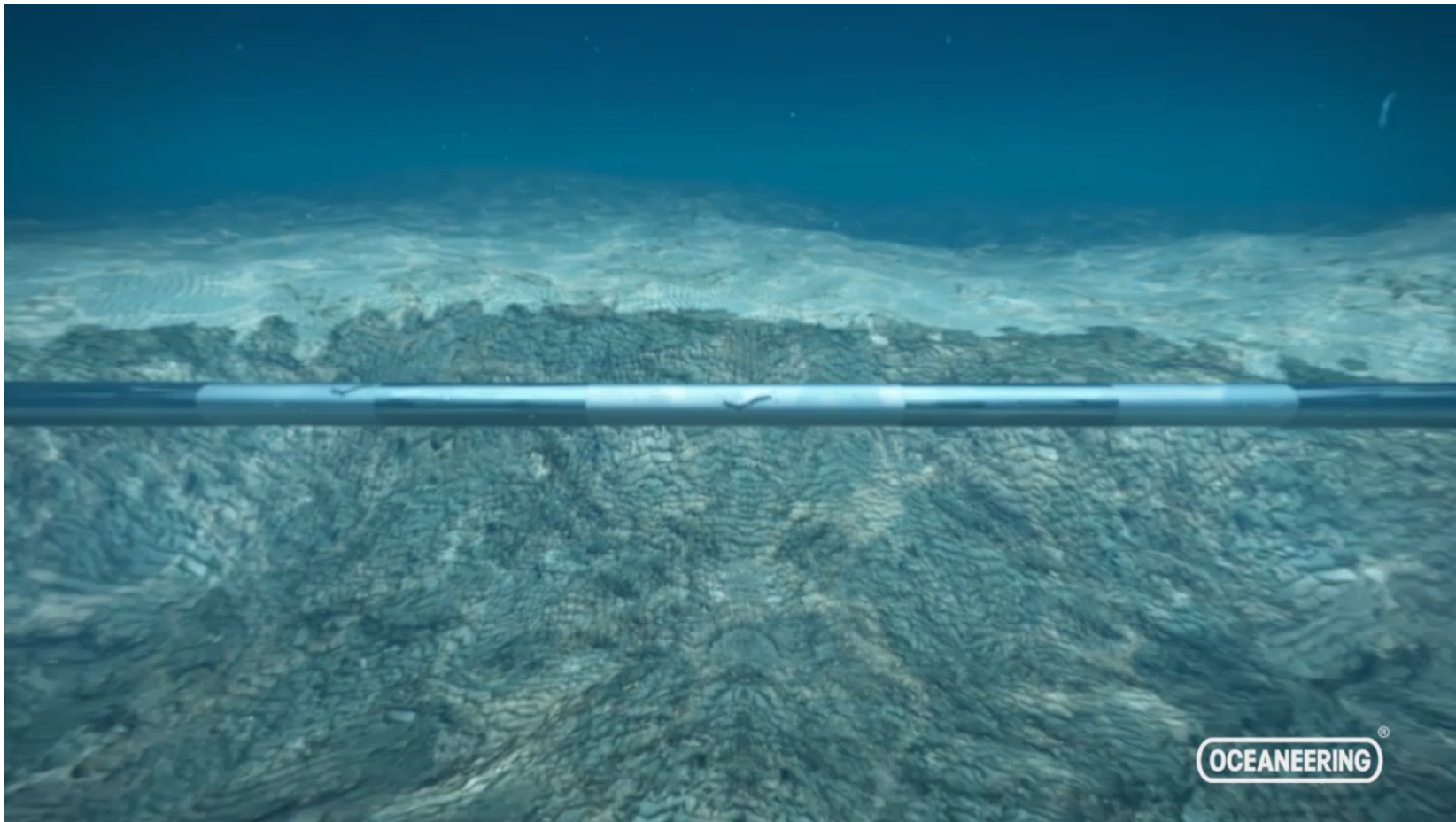
Structural Smart Tap

- No need to shutdown the pipe
- Installable in both horizontal or vertical plane
- Structurally reinforced connection allows larger diameter taps
- Bundle service package include Technicians and Equipment
- Stocked as clamp bodies with a quick turnaround time to be machined and add the valve flange in accordance with customer specification



Subsea Hot Tap Diver Installed





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Connecting What's Needed with What's Next™