Diverless Brace Installation Varg A

FFU seminar 26.01.2012

DEEPOCEAN

Who am I ?

DIVERLESS BRACE INSTALLATION – VARG A

Content:

- Back ground
- Onshore planning
- Offshore operations

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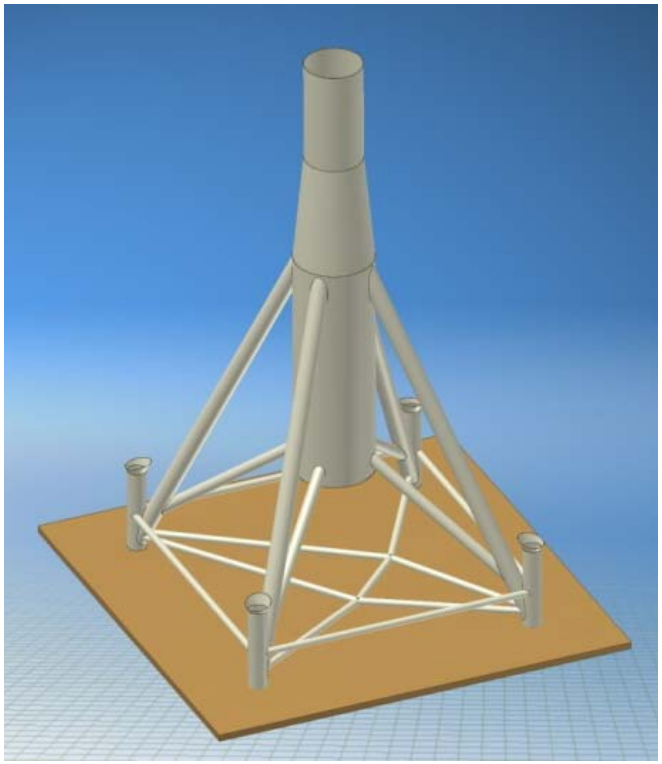
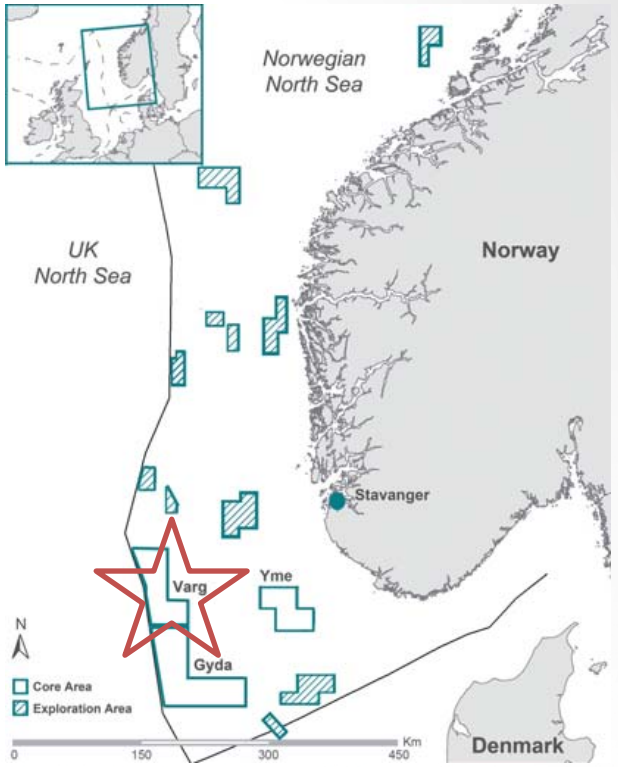
Varg A – Monotower wellhead platform
Water depth approx. 84 meters





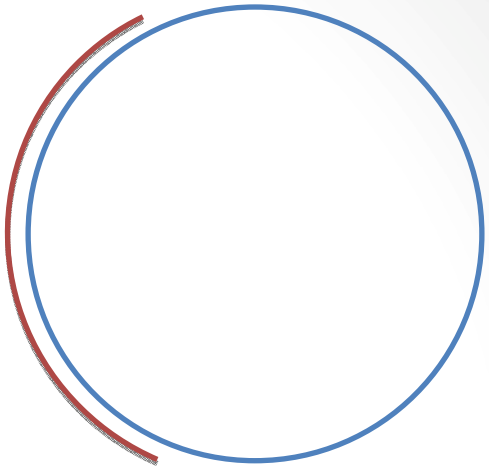
Background

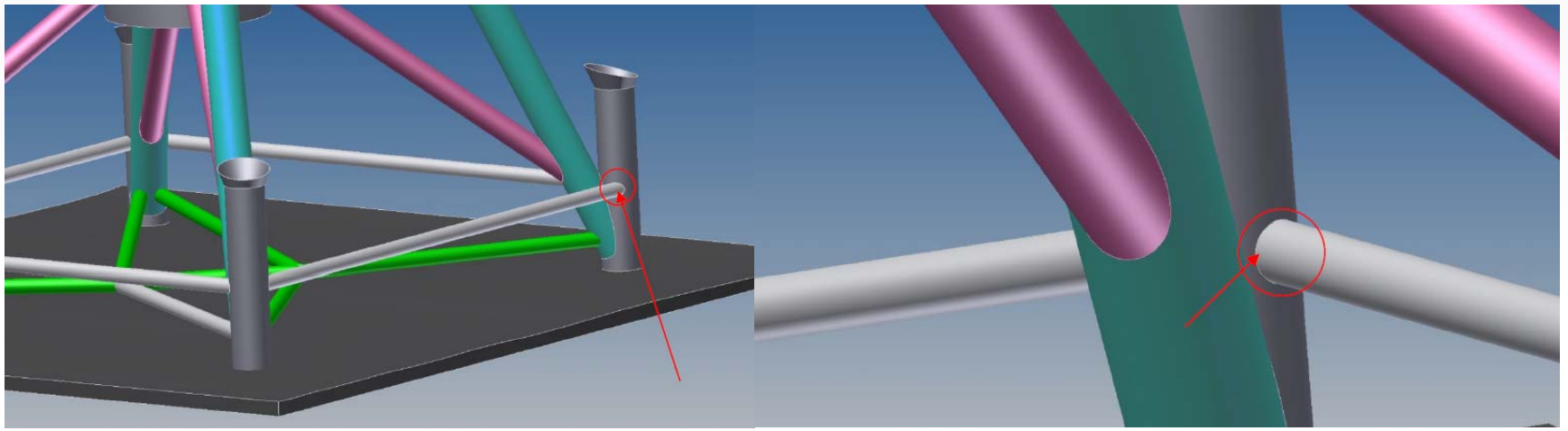
Crack in brace discovered by DeepOcean during the yearly inspection campaign

Background

Brace outer diameter – Approx. 1 m

Crack located in weld seam from 7 to 11 o'clock in complex location for ROV and ROV tooling access





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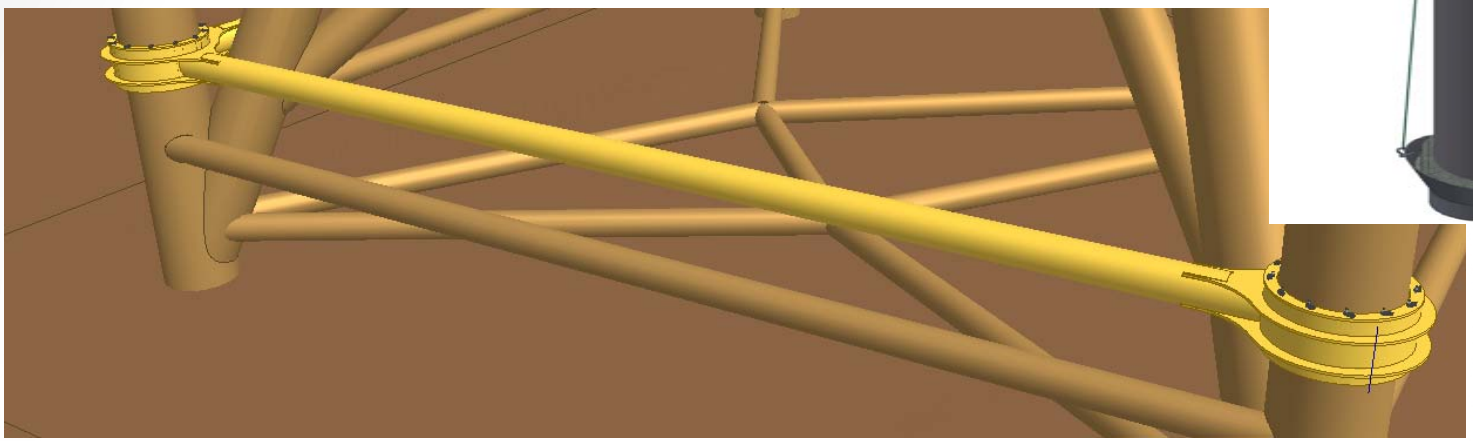
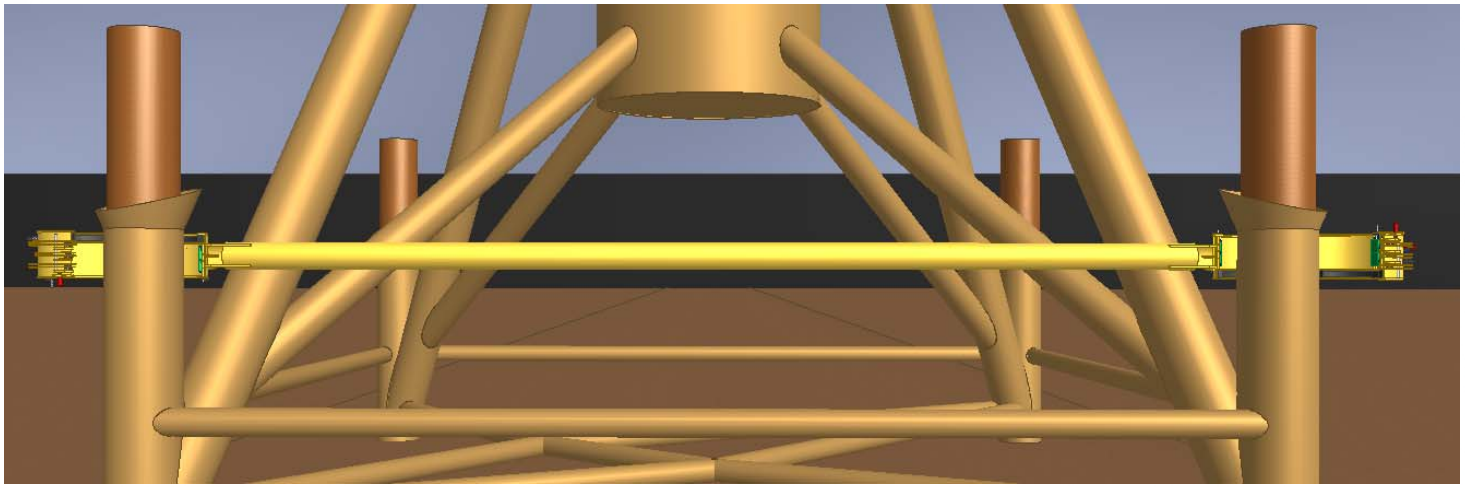
Study: Closed and Hinged Clamp Evaluated

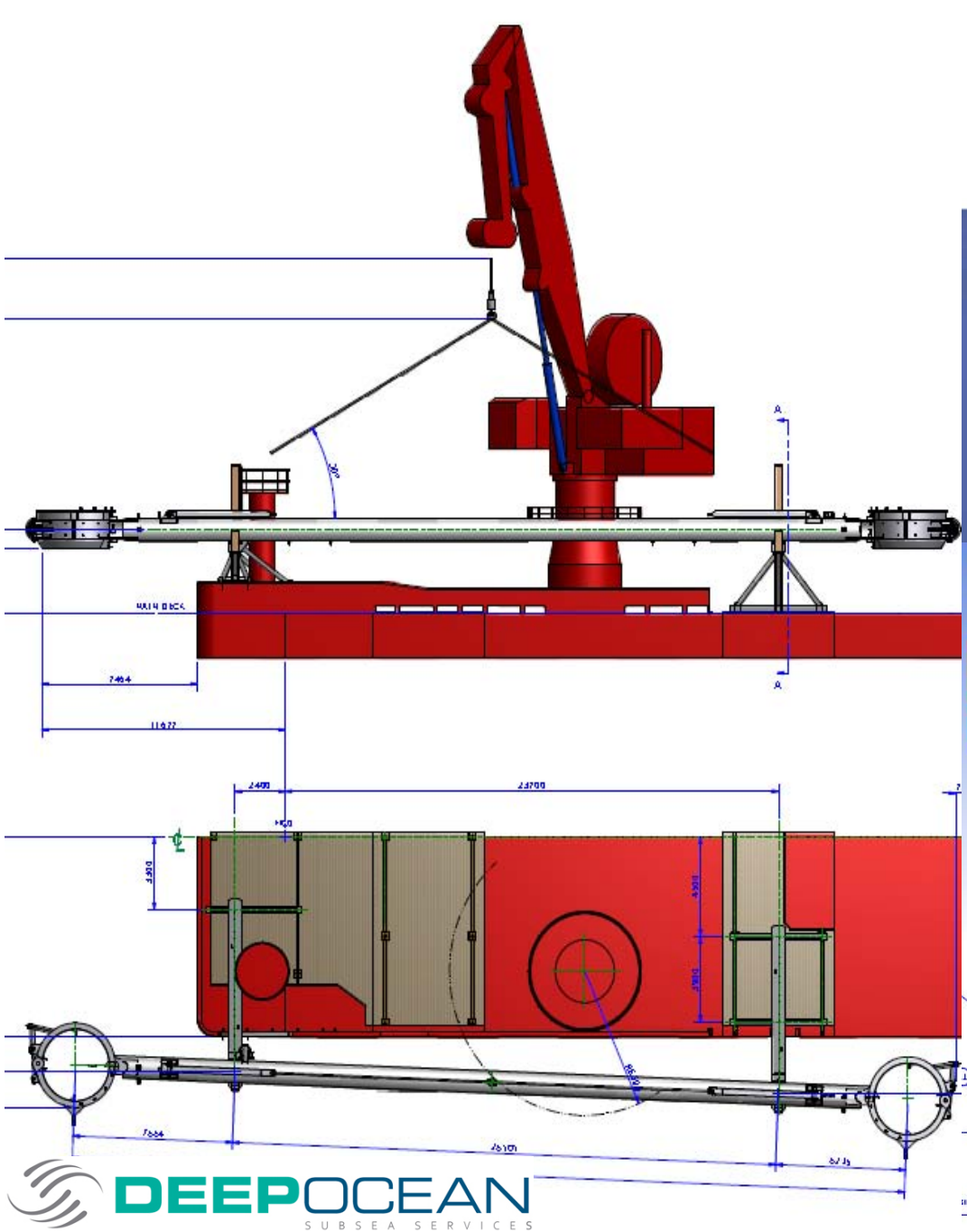


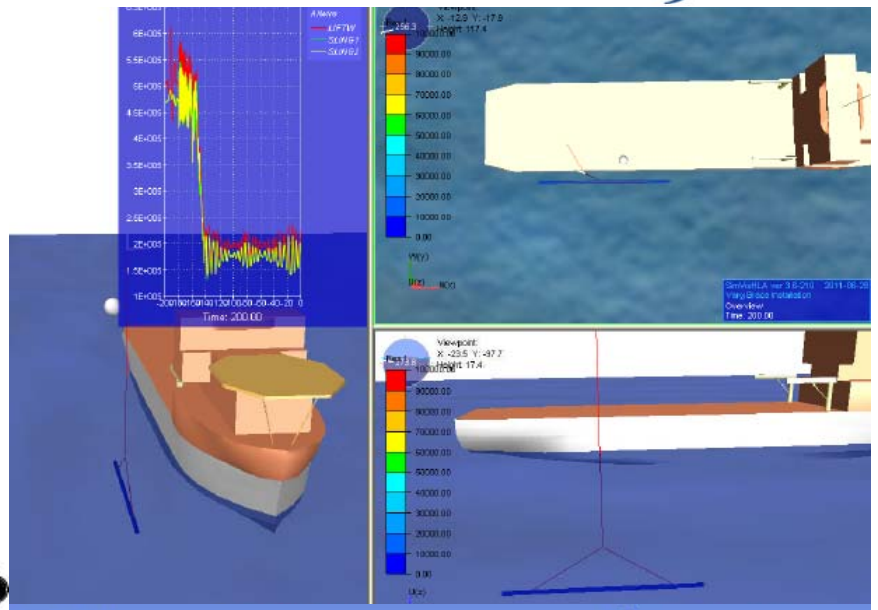


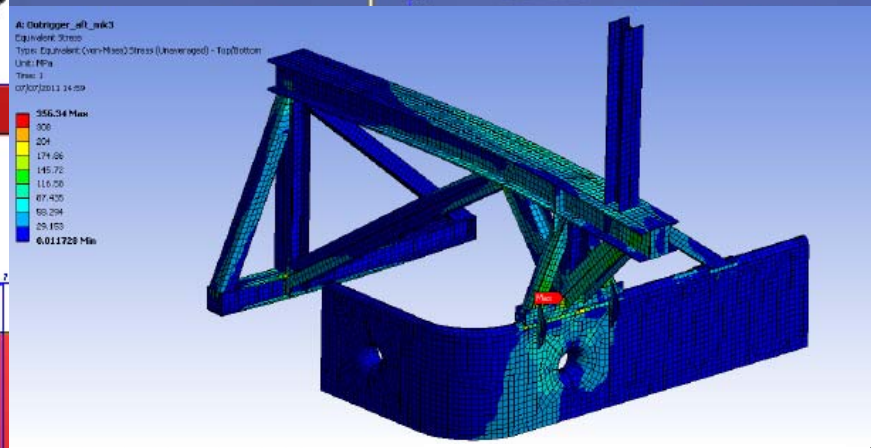
	Length	Weight in Air	Weight in Water
New Brace	45 m	51 e	19 Te

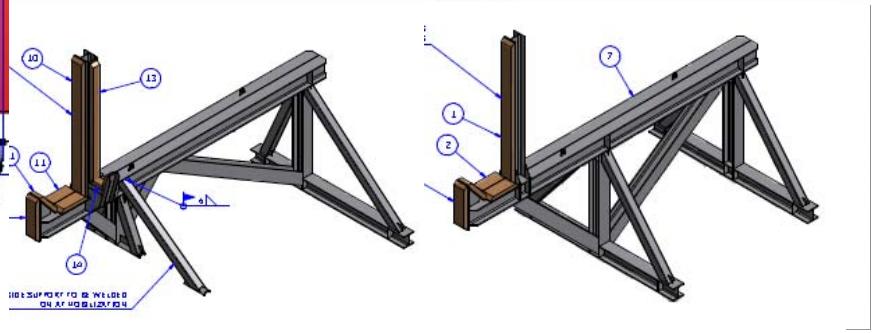
	Length	Weight in Air	Weight in Water
Old Brace	36 m	42 Te	13 Te

Campaign 2 - Preparations : Design of outriggers and SIMO analyses

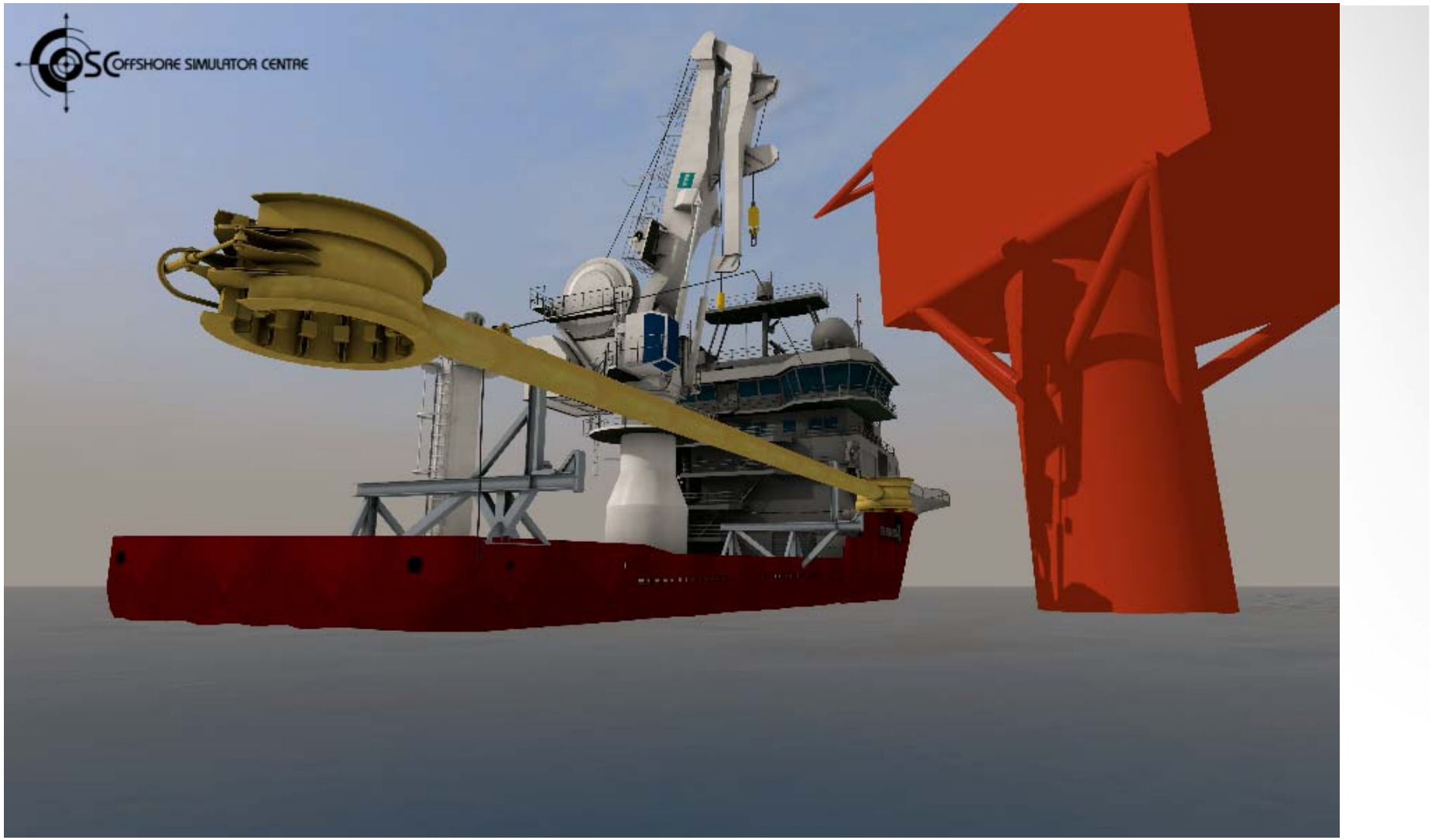








Campaign 2 Preparations
Simulator training offshore lifts

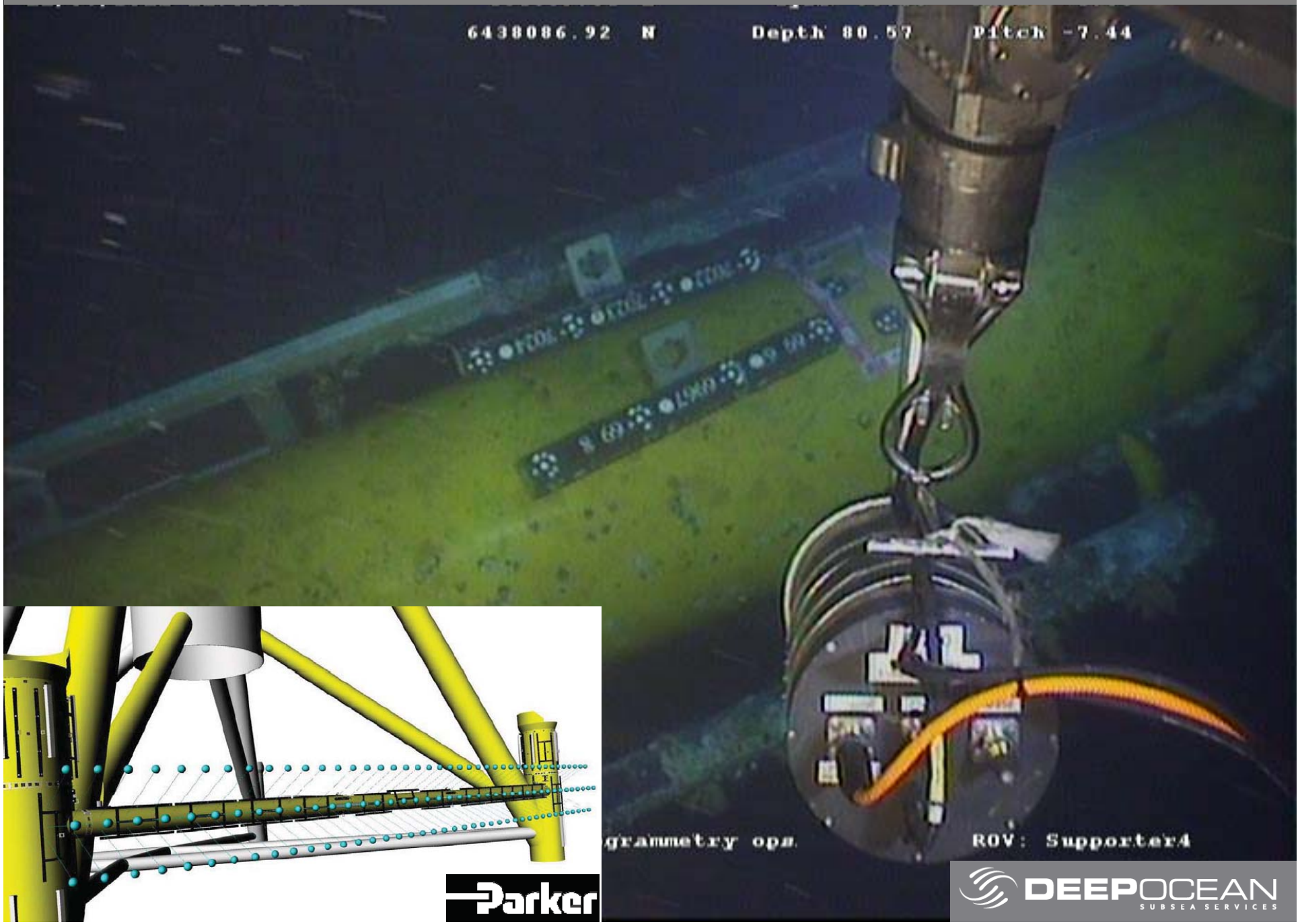


Campaign 1 – Northern Canyon

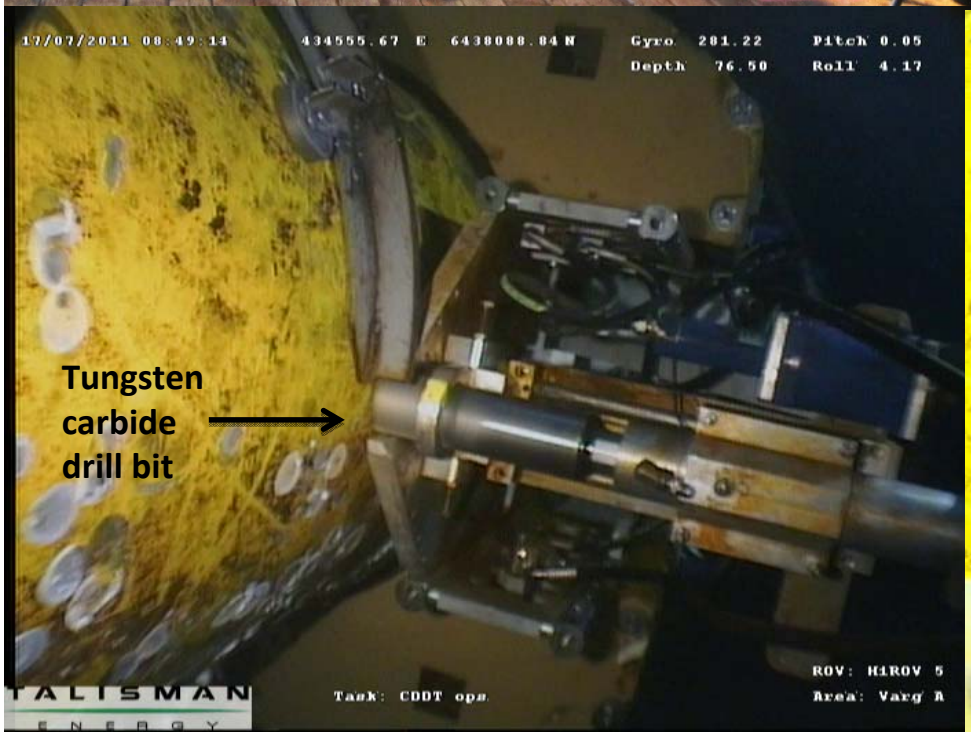
Campaign 1 – Cleaning / removal of marine growth

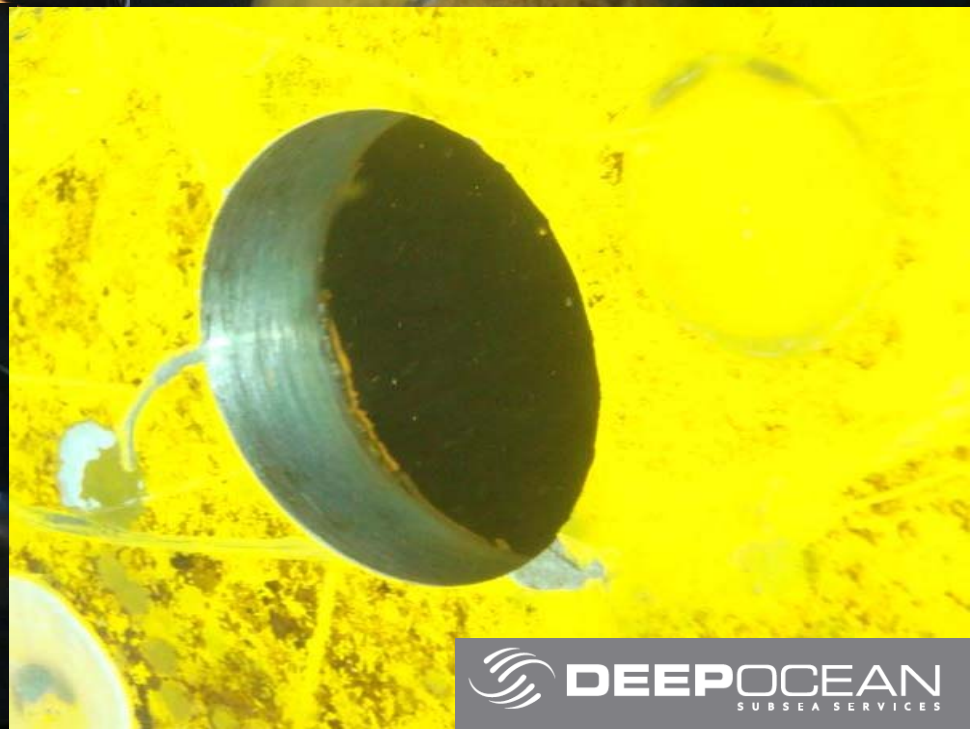
Campaign 1 – Removal of 12 anodes and other obstructions

Campaign 1 – Photogrammetry



Campaign 1 – Drilling of 4 off 90 degree holes to accomodate for lifting aids





Campaign 1 – Drilling of 3 holes to prevent further crack development

Test Phase

Campaign 2 – Volstad Surveyor

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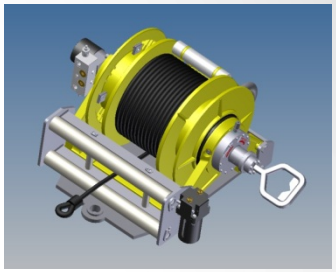
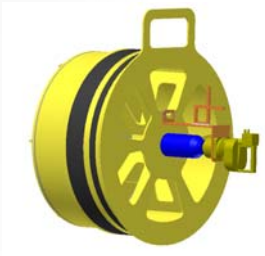
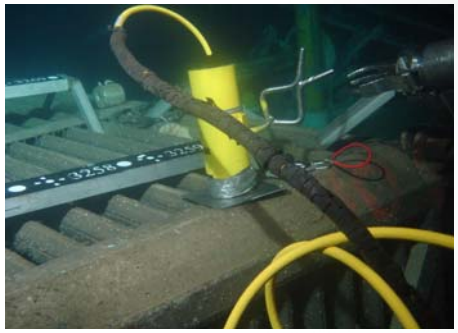
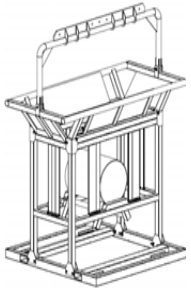
Additional project equipment









Campaign 2 – Volstad Surveyor

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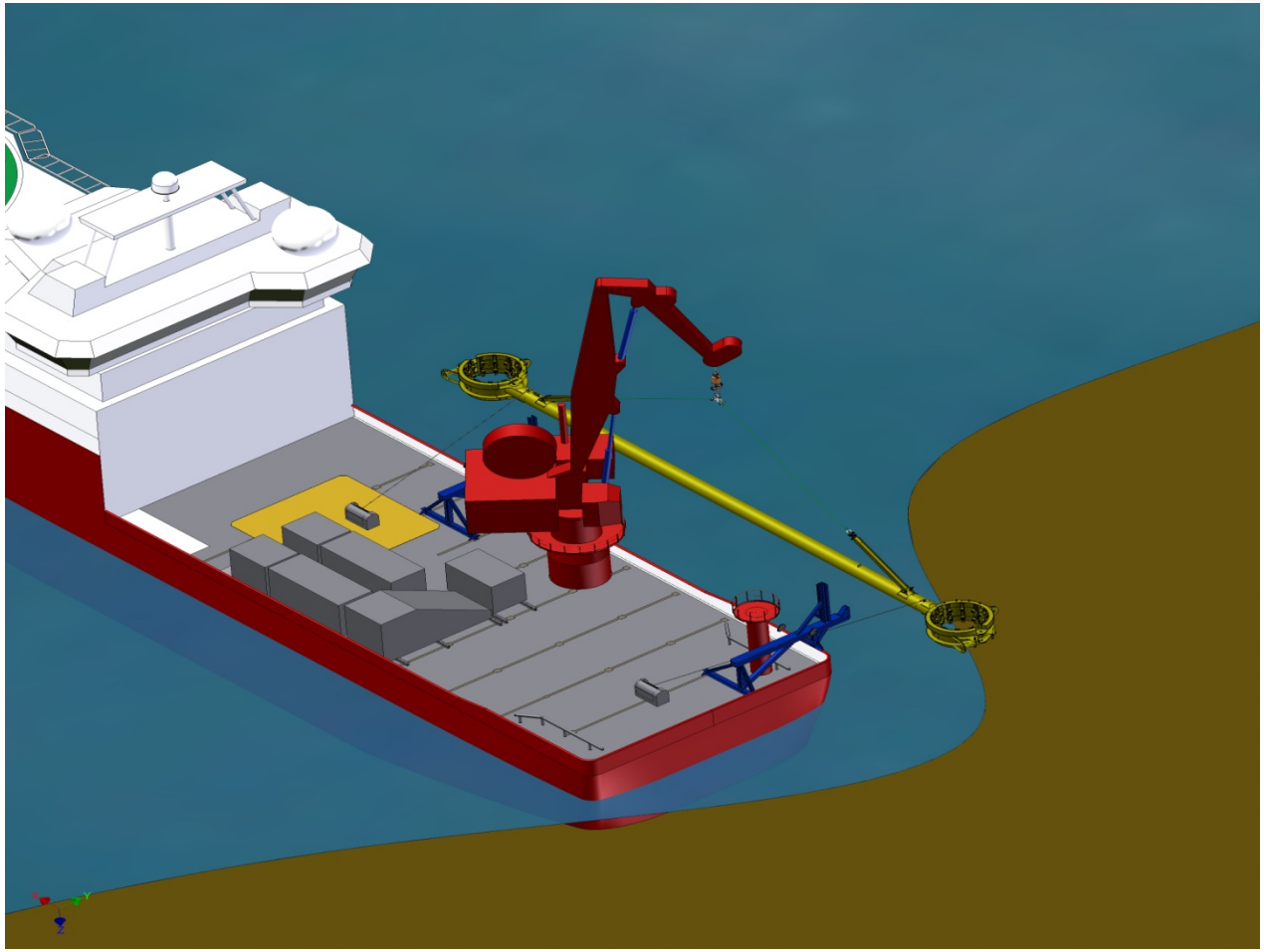
Lower through splash zone with holdback tugger lines to control brace



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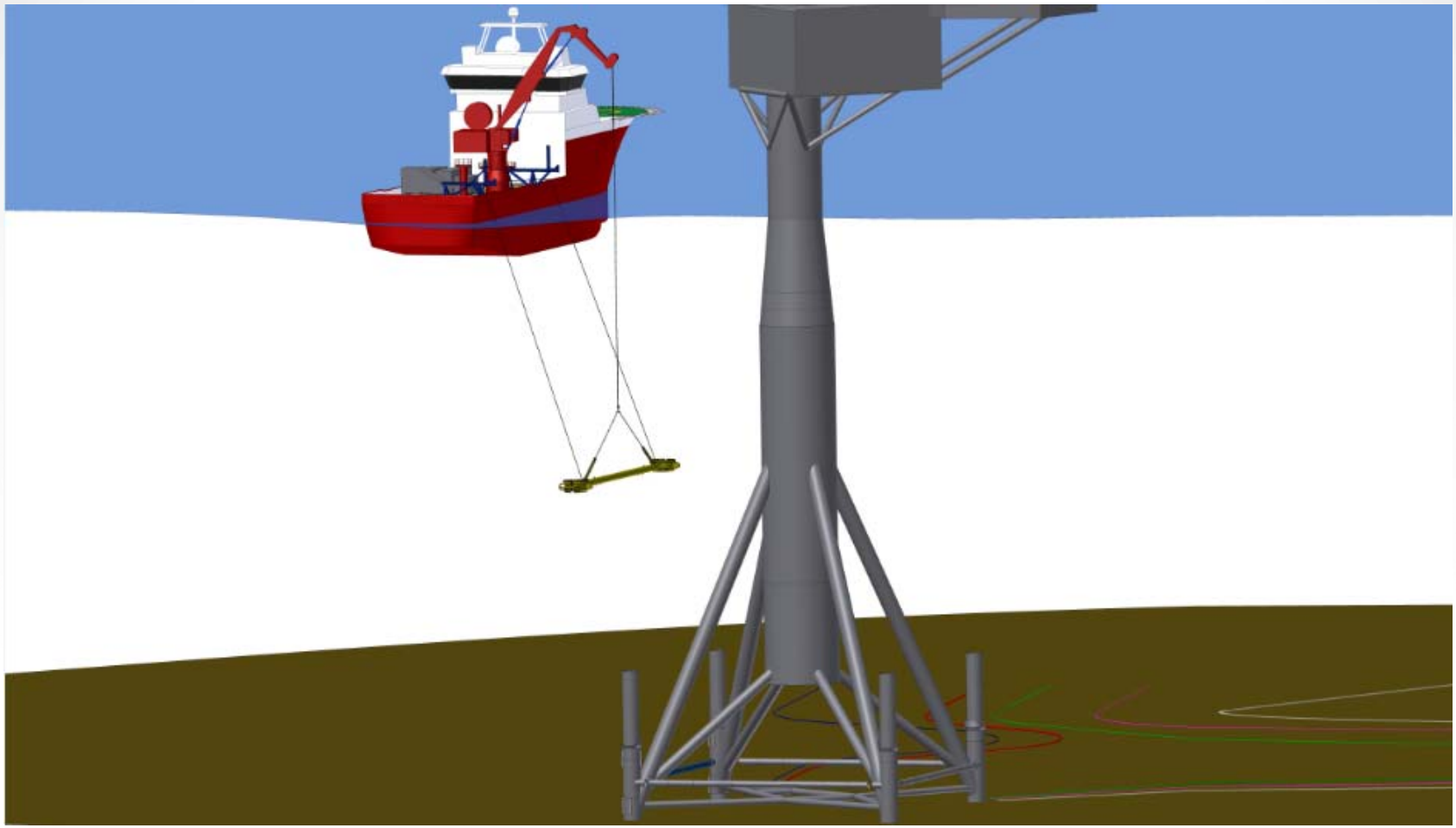
Continue lowering & monitoring with ROV's



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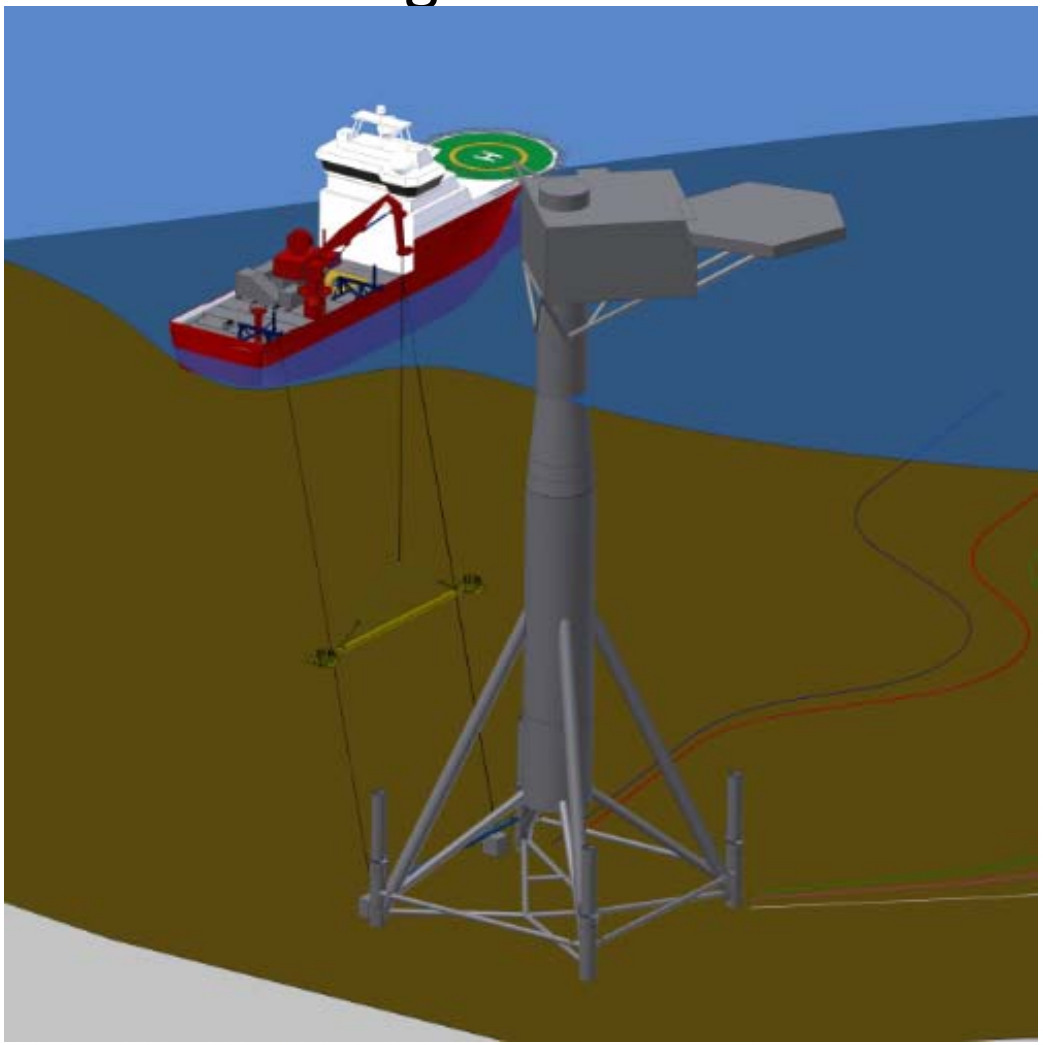
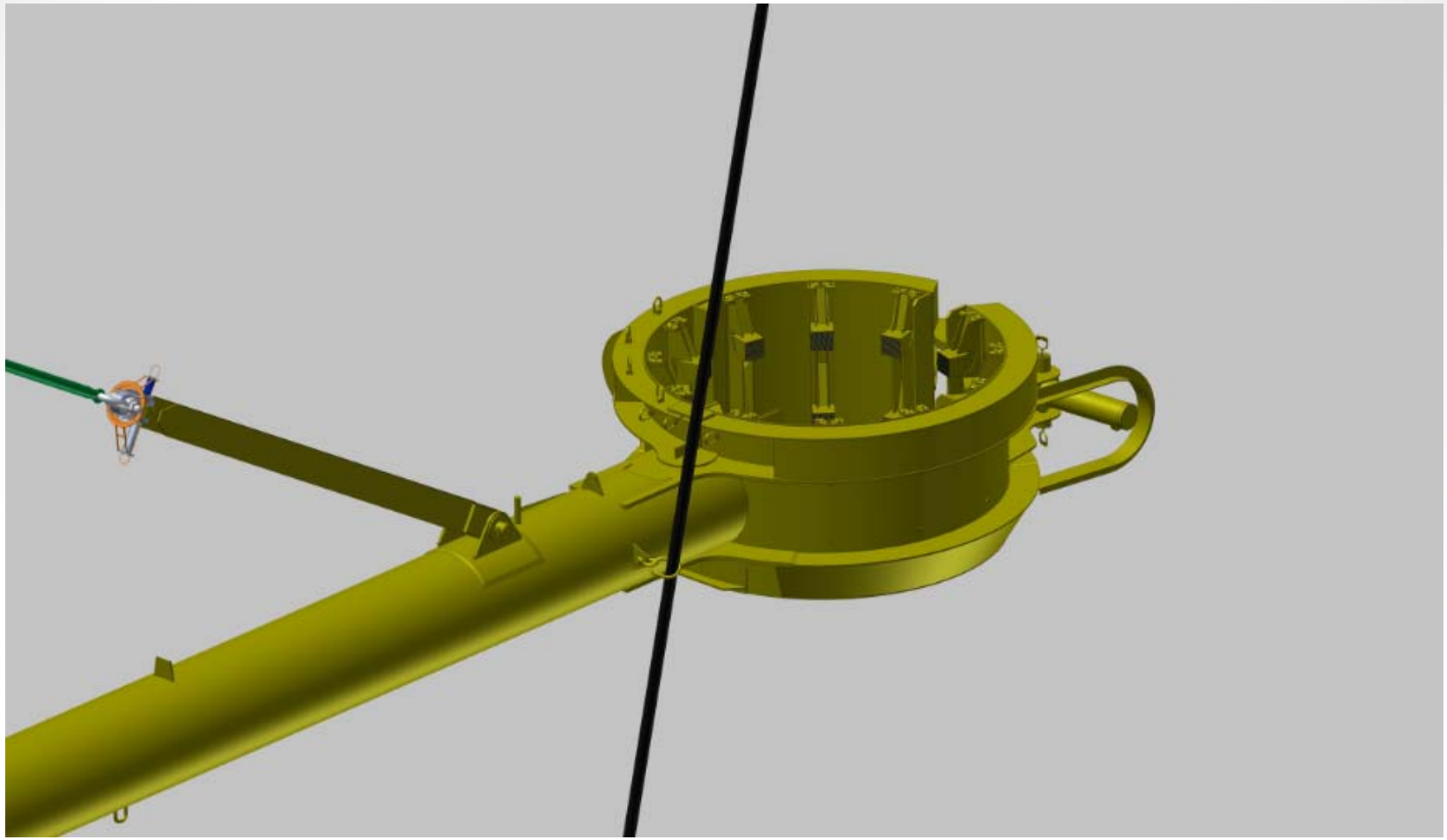
Disconnect tugger winch lines
Reconnect as guide wires via DMA's

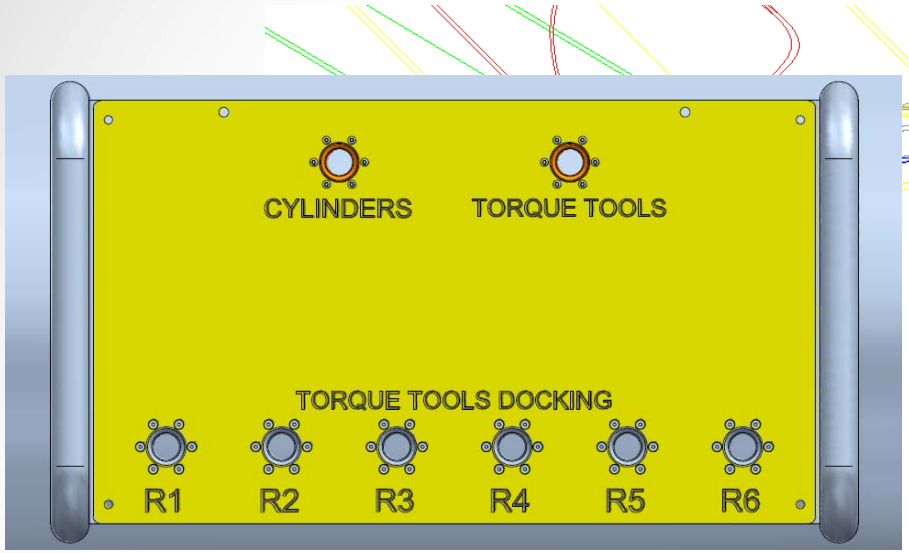


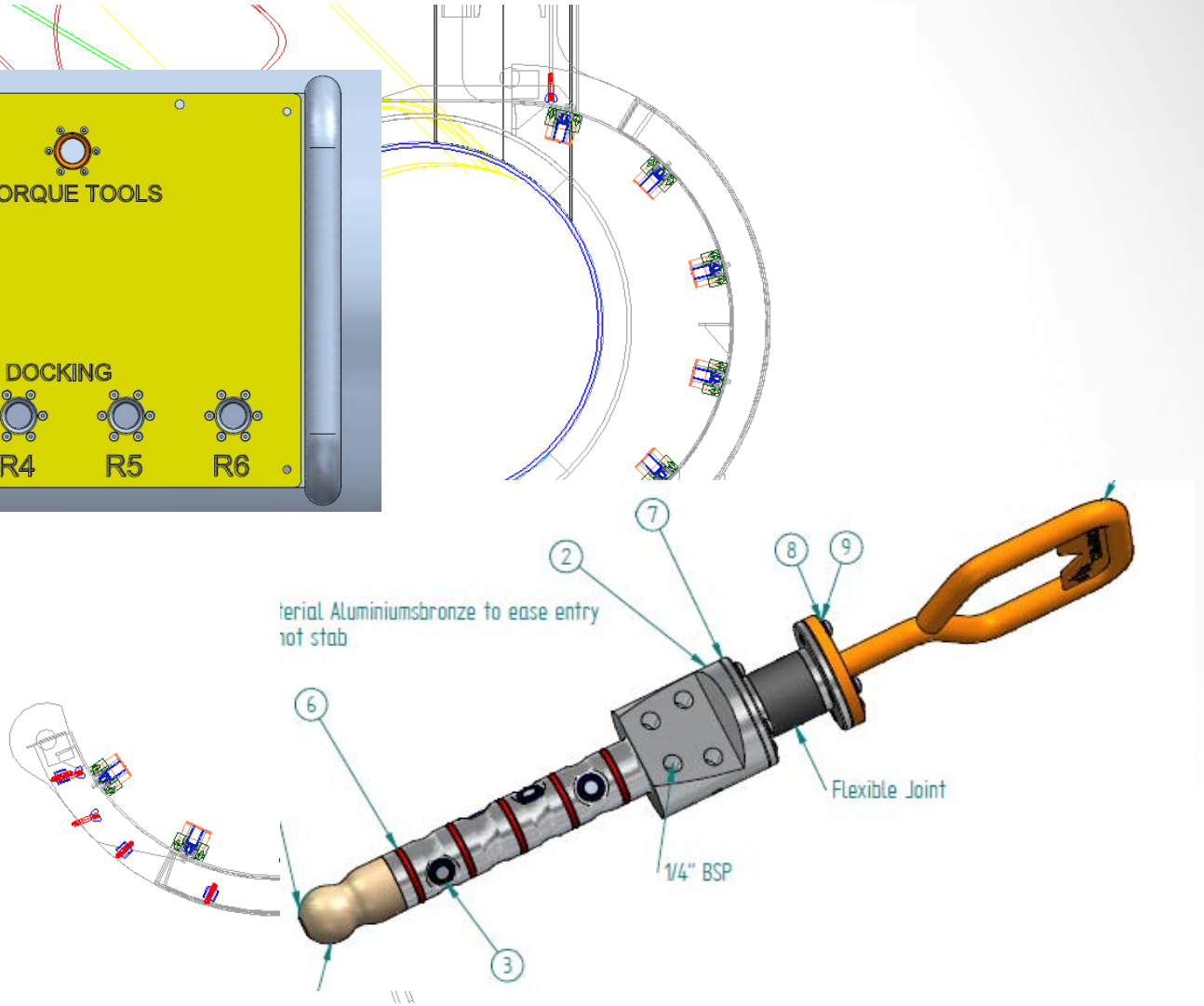
Change from holdback wire to guide wire mode

(ROV disconnects wire, passes through masterlink & connects to DMA on seabed)

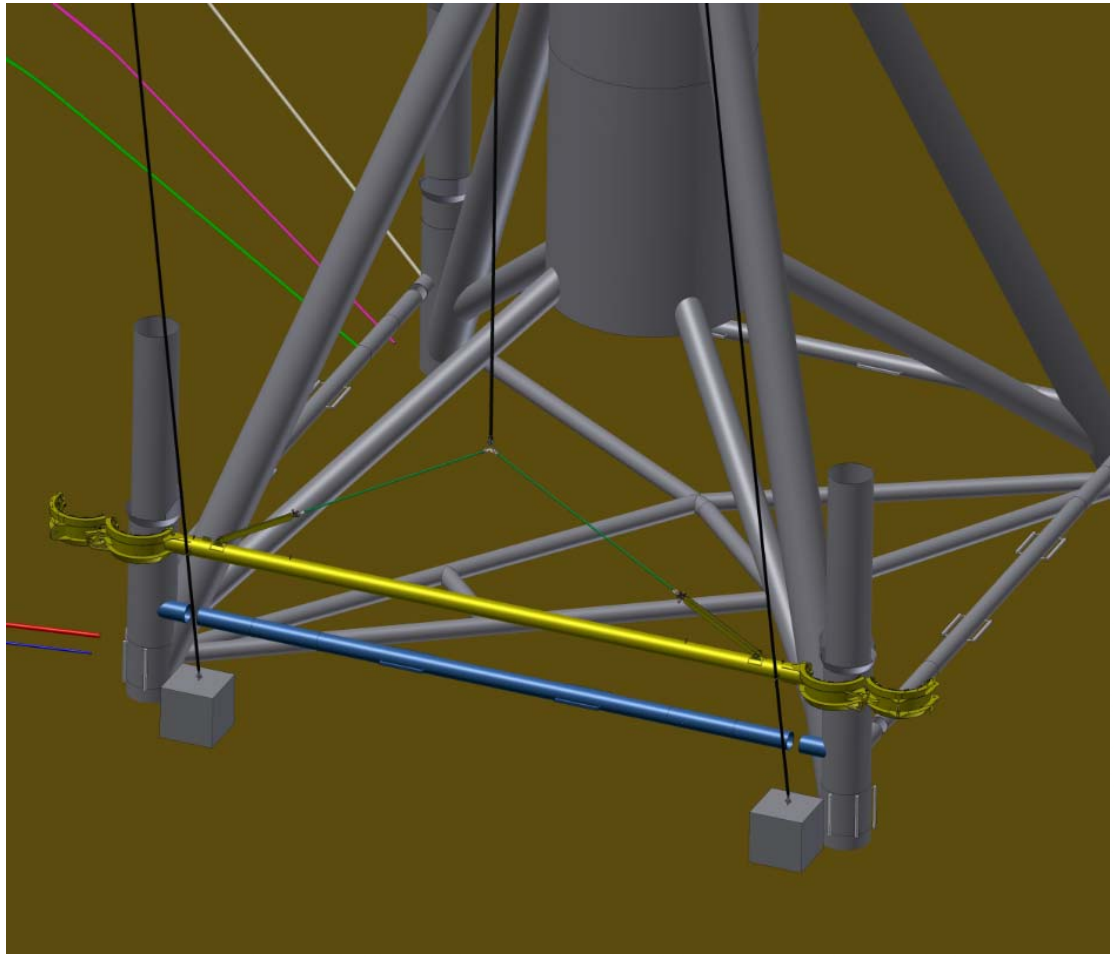


ROV opens clamp to position using hot stab

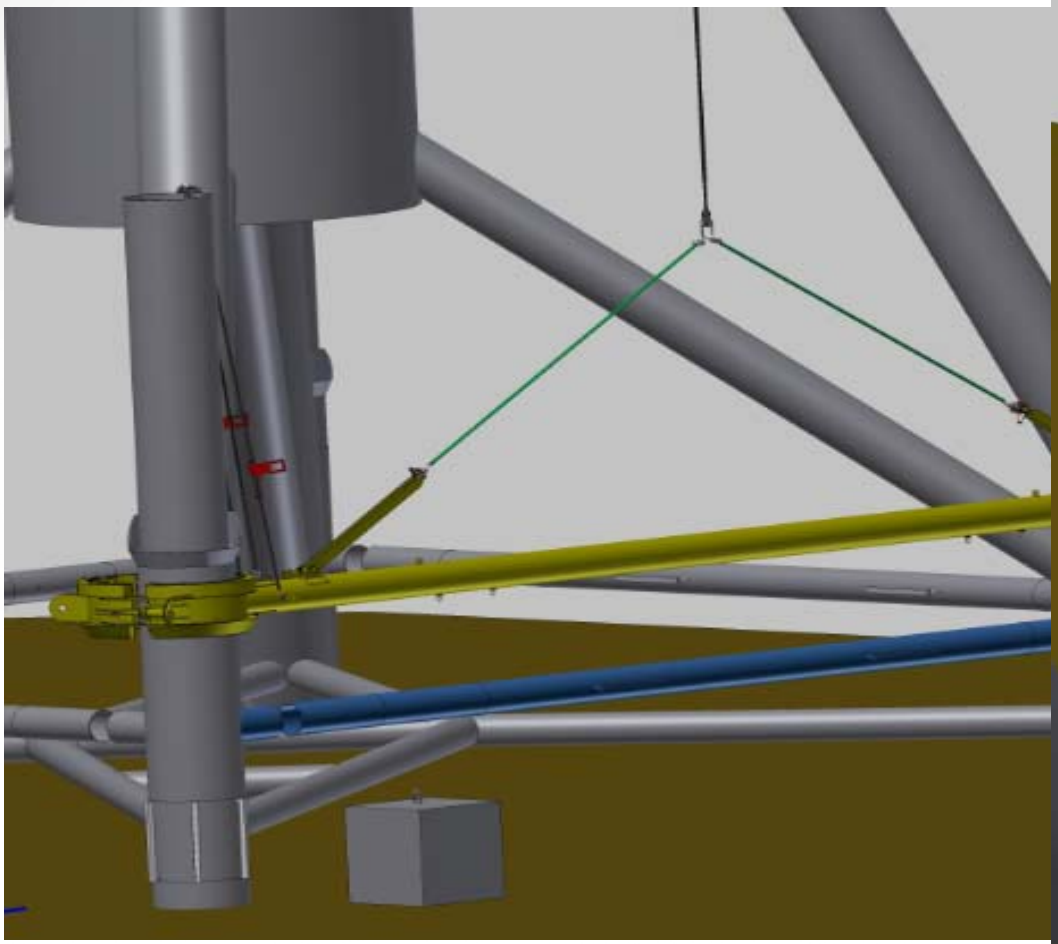




Lower brace into position close to pile sleeve guides



Install hang-off rigging w/ ROV operated hydraulic chain blocks



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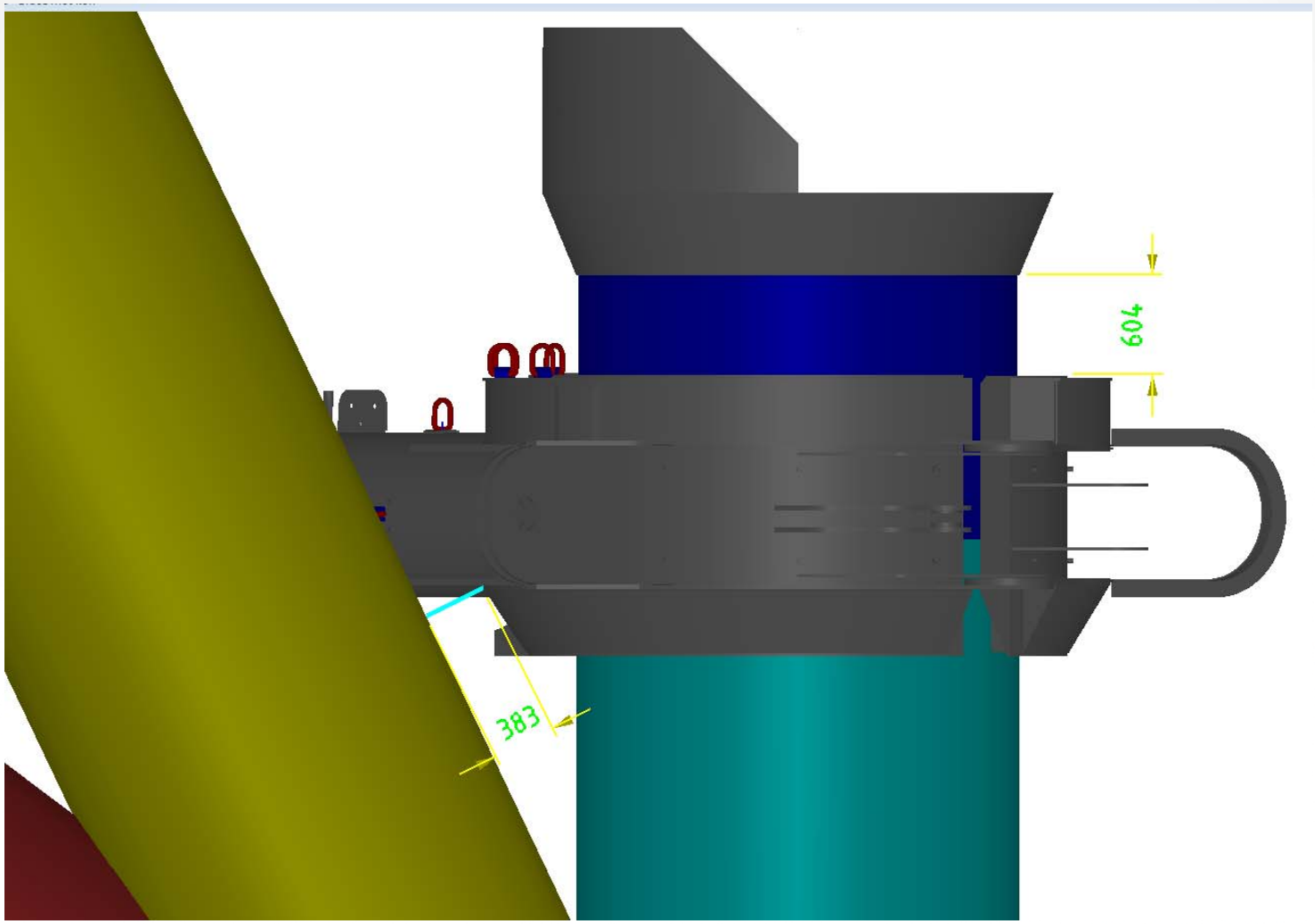
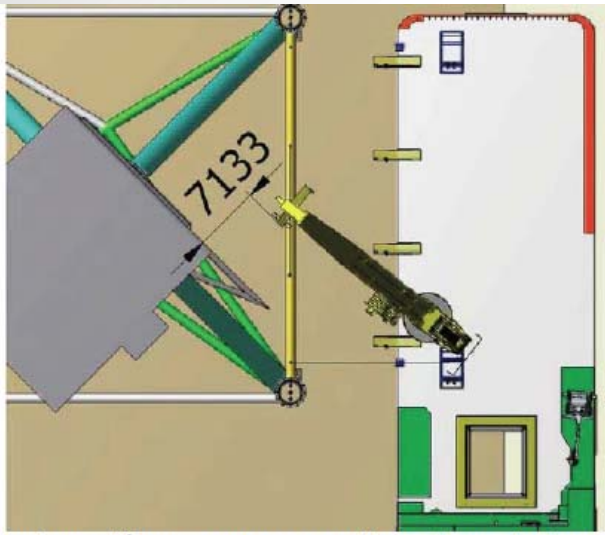
Clamp fully closed in final position
383mm clearance

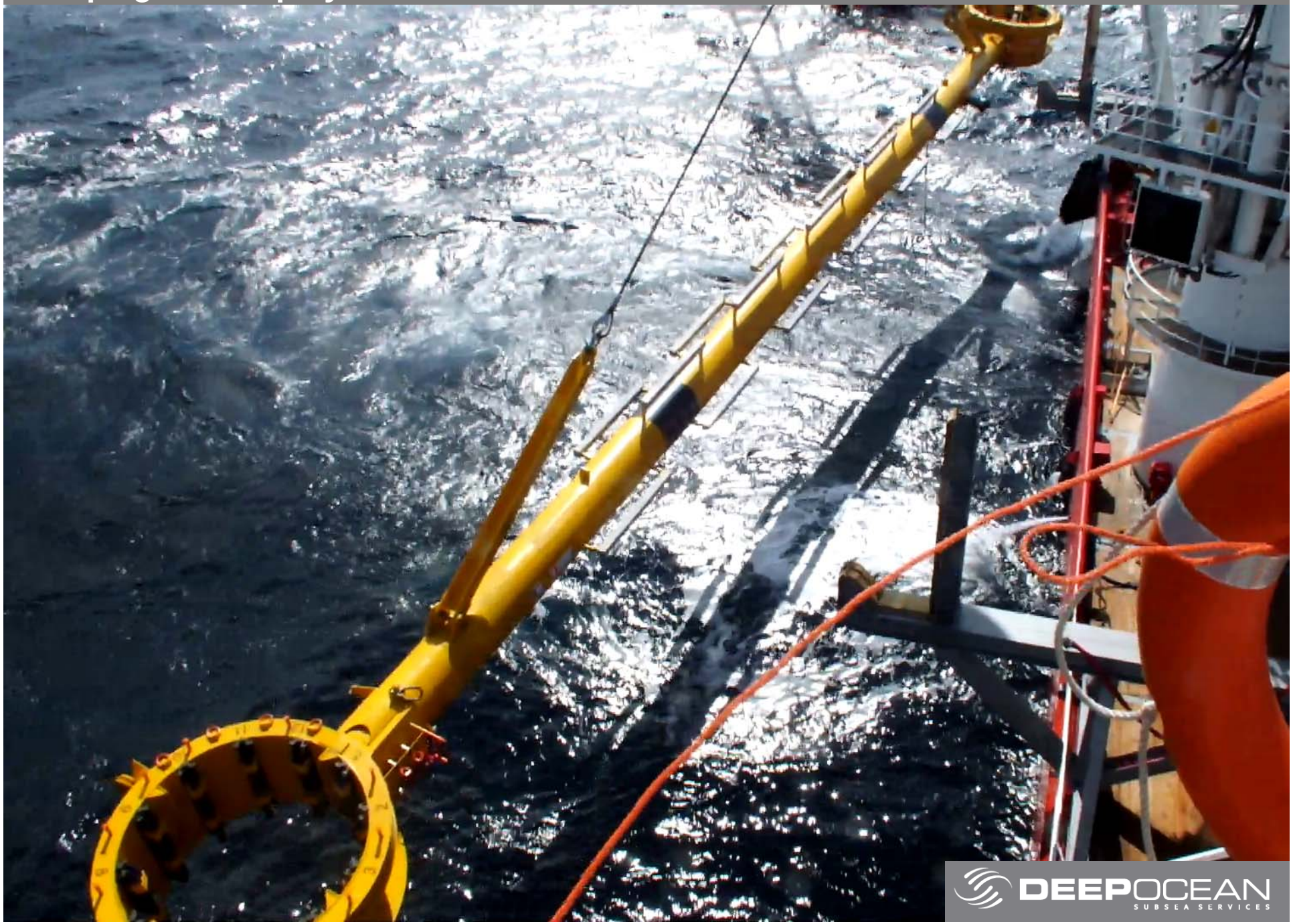


Campaign 2 – Working close to plaform

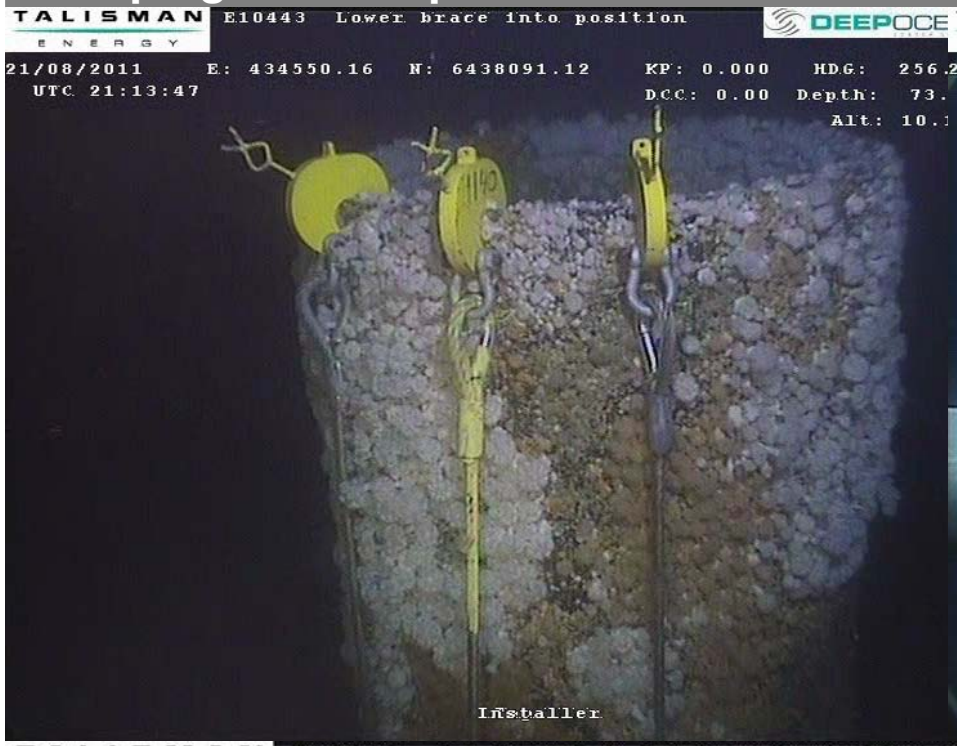


Typical vessel/crane arrangement during brace deployme

Campaign 2 – Deployment



Campaign 2 – Preparations



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Campaign 2 – Deployment

Campaign 2 – Opening clamps

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Campaign 2 – Hang-off and aligning

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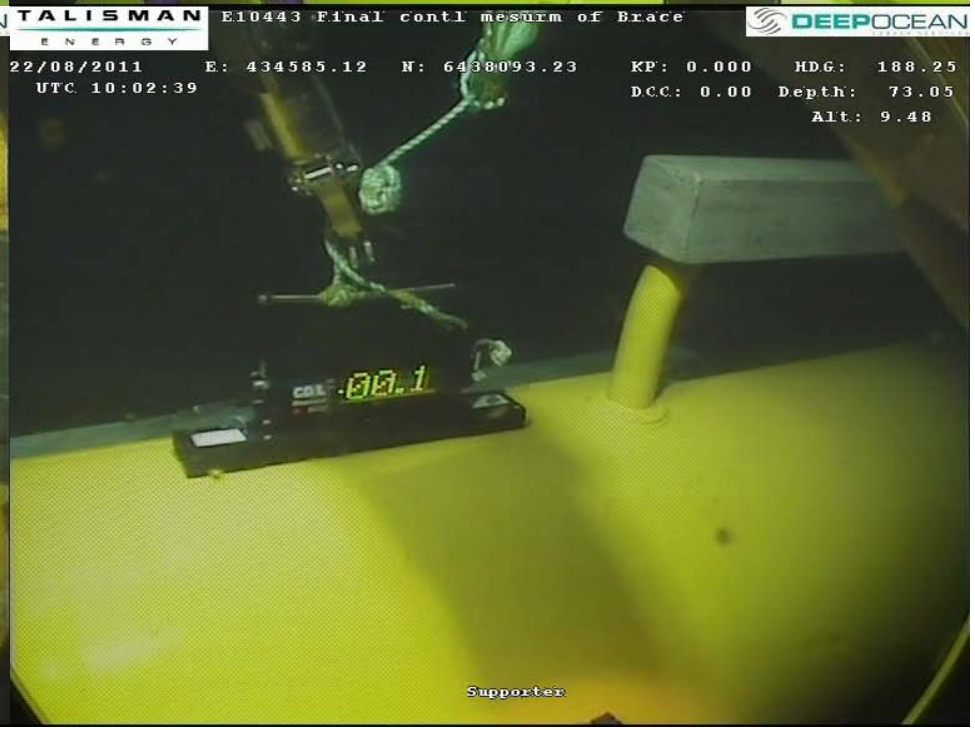
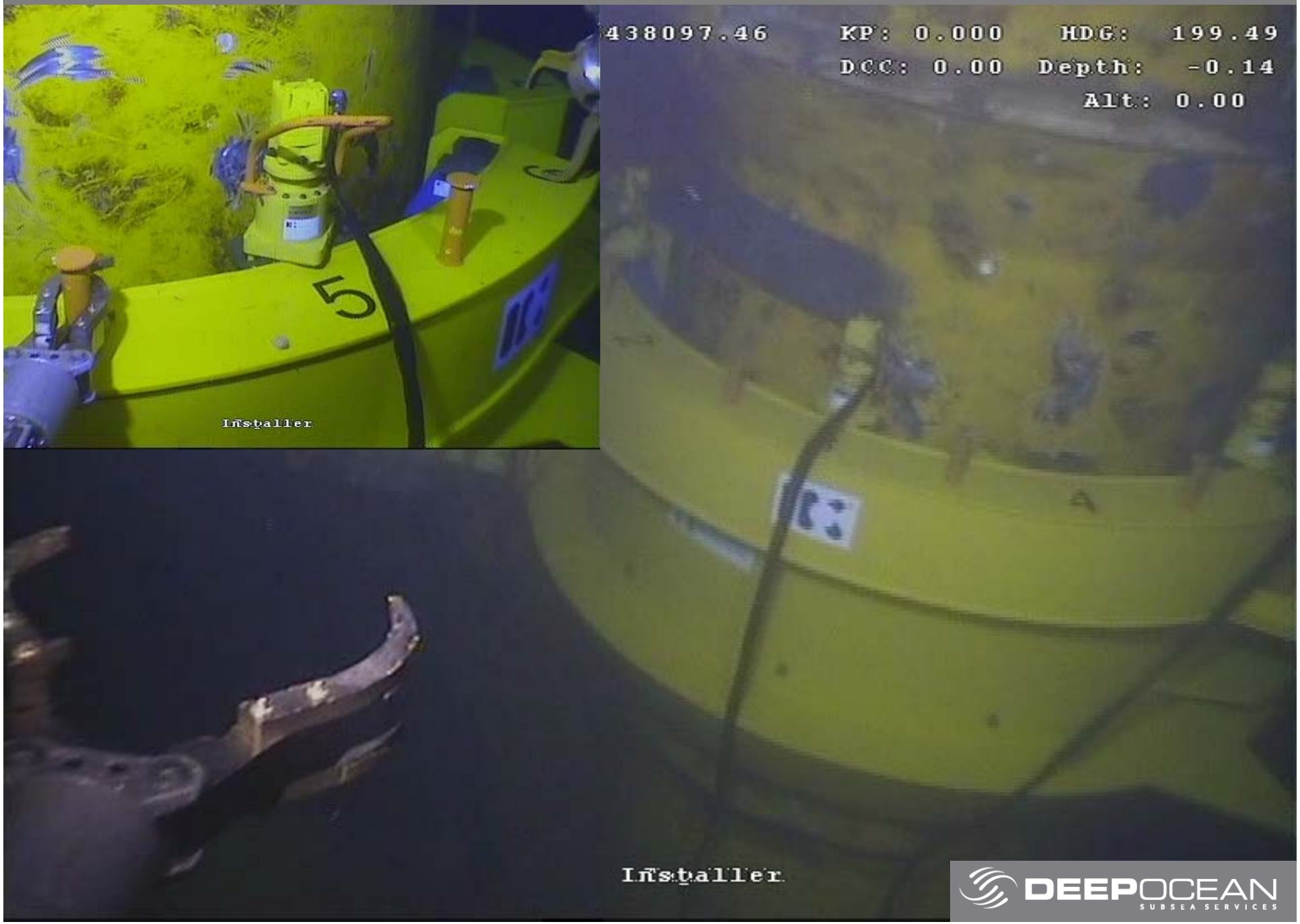
Campaign 2 – Closing clamps

Campaign 2 – Locking clamps, aligning & levelleling



Campaign 2 – Torquing operations

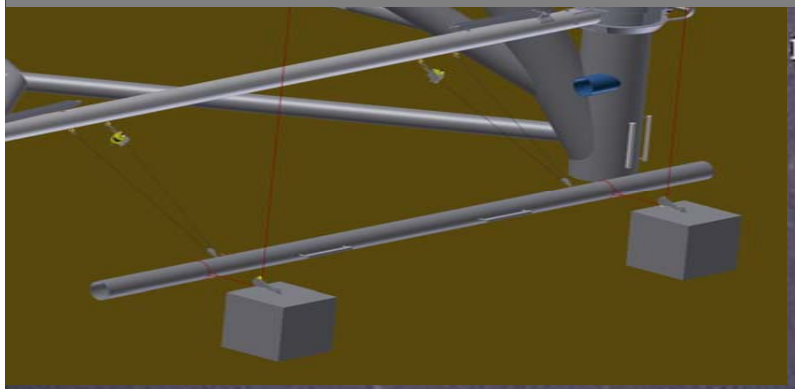


Campaign 2 – Dogs engaged

Campaign 2 – Hanging off old brace in new brace

Campaign 2 – Cutting old brace

Campaign 2 – Lowering old brace to seabed



Campaign 2 – Installing plugs to keep water in brace during recovery

Campaign 2 – Lifting aids for old brace

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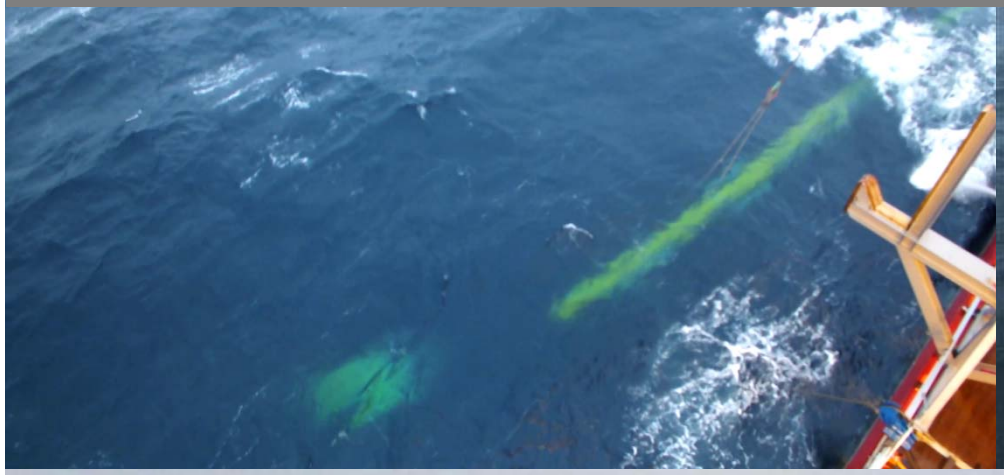
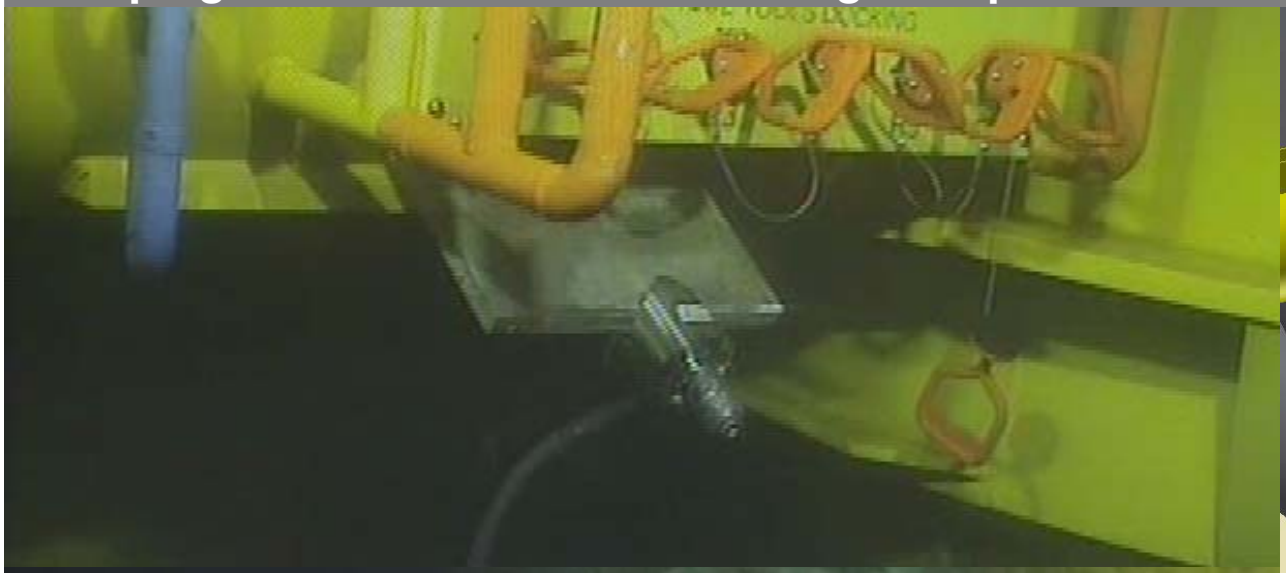
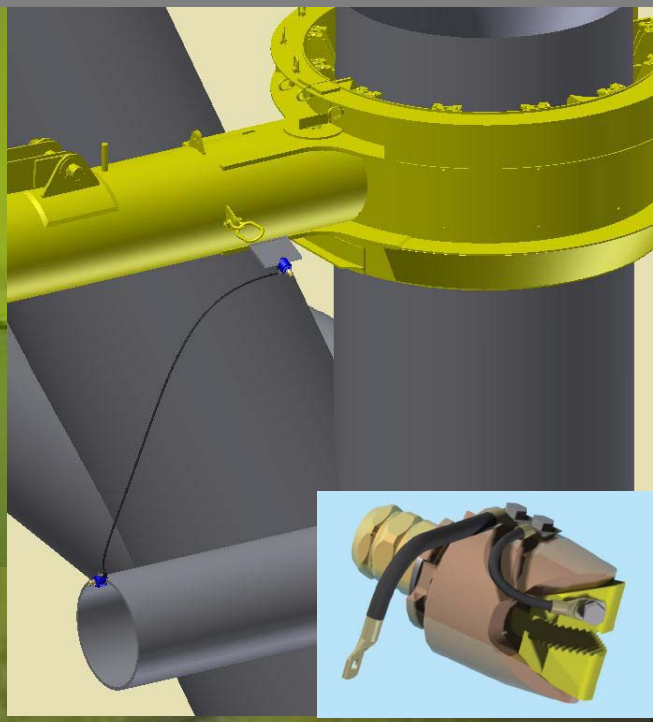
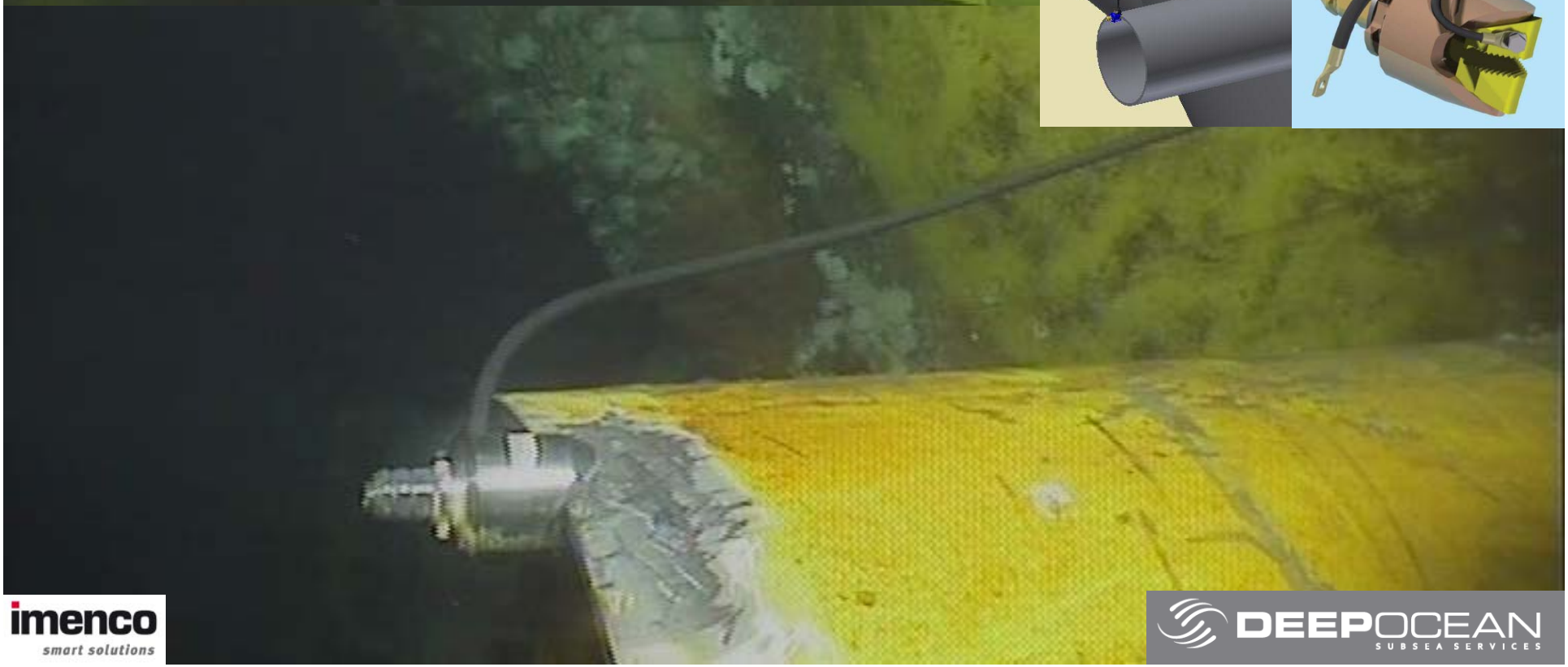
Campaign 2 – Recovery of old brace



Campaign 2 – Installation of earthing clamps







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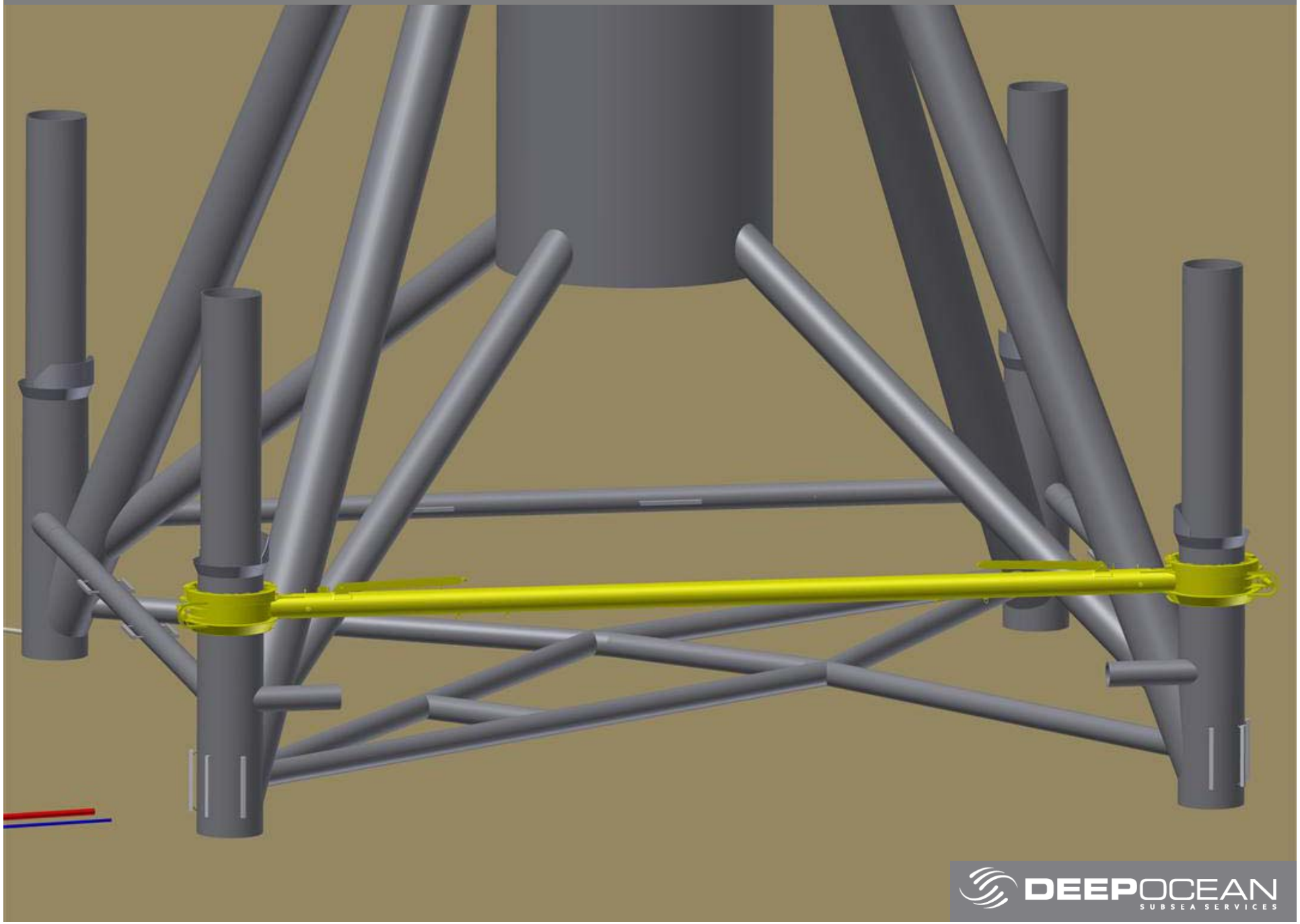
As-installed



Experience

- Technical solutions worked planed
- No injuries
- Project performed within schedule

- Key factors for success:
- DeepOcean and IK was involved early in the process
- Simulation of lifting operations
- Offshore personnel involved in planning
- Engineers involved in planning went offshore
- Good communication between all Parties

Timeline

December 2010 → August 2011

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Companies involved

TALISMAN ENERGY

DEEPOCEAN SUBSEA SERVICES

nexum engineering as

Seagear

semco maritime

Parker

A. OLUFSEN SKIPSSERVICE AS

imenco smart solutions

DNV

DEPRO

LOC

GCRIEBER

VOLSTAD

ATKINS

daVinci

RANDABERG INDUSTRIES

DREIESERVICE

Brødr. HAUKÅS Mek.Verksted

SØRSKÅR MEKANISKE VERKSTED

HØGSKOLEN I ÅLESUND Aalesund University College

SCANTECH A James Fisher Group Company

CUT

Proserv OFFSHORE

DPS OFFSHORE

OSC OFFSHORE SIMULATOR CENTRE AS

FABRICOM GDF SUEZ

WESTCON LØFTETEKNIKK AS

BLUE LOGIC

OCEANEERING

FORCE TECHNOLOGY

Thank you for your attention !

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