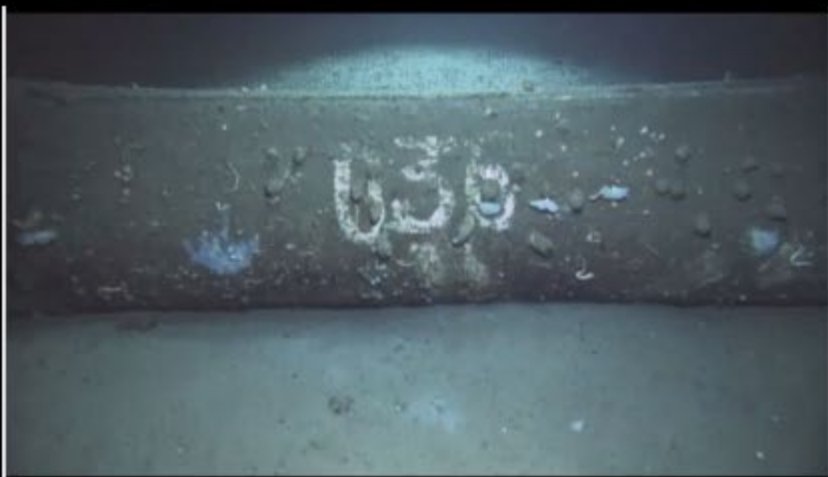


AI Rumson DeepOcean

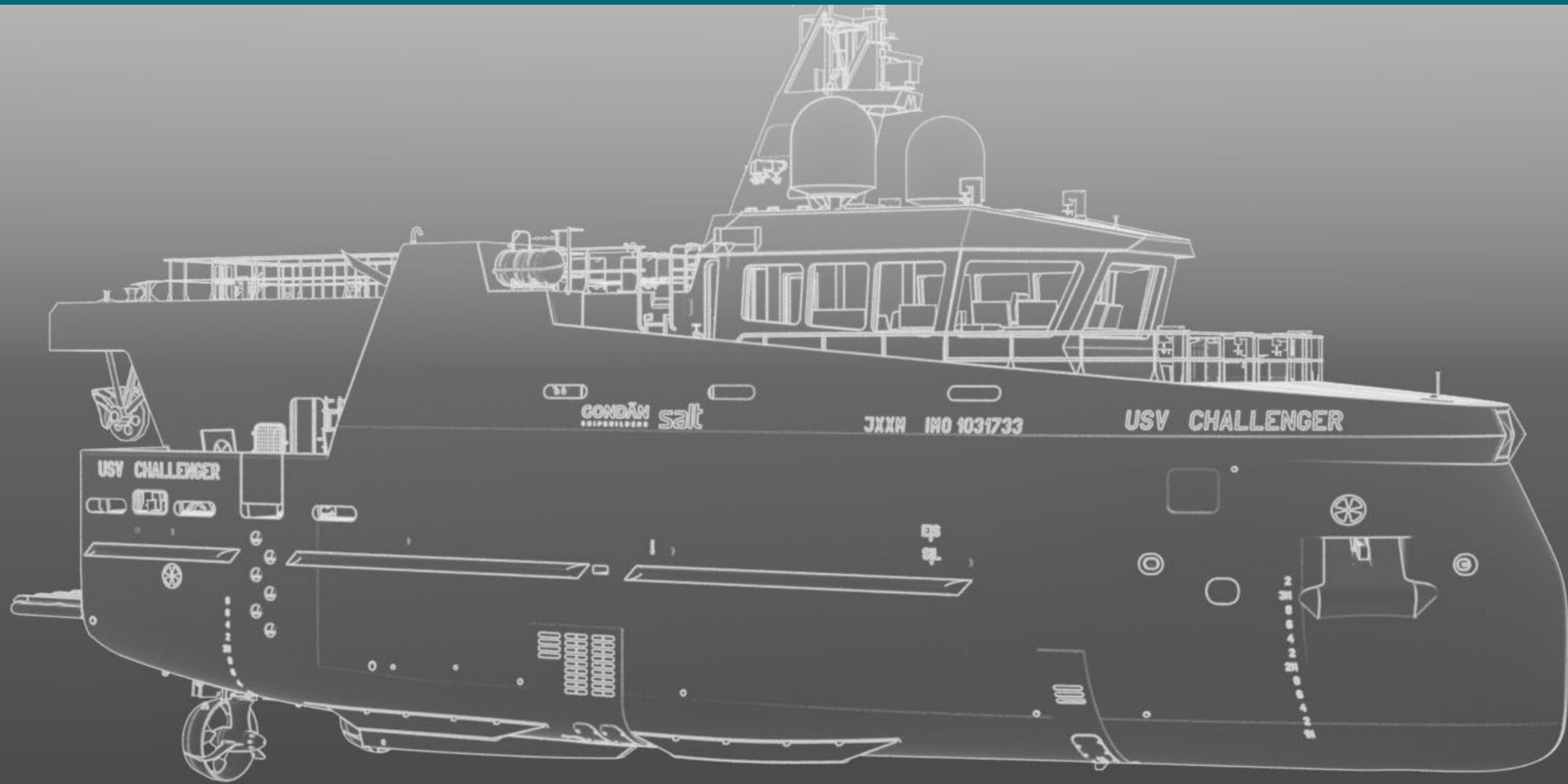
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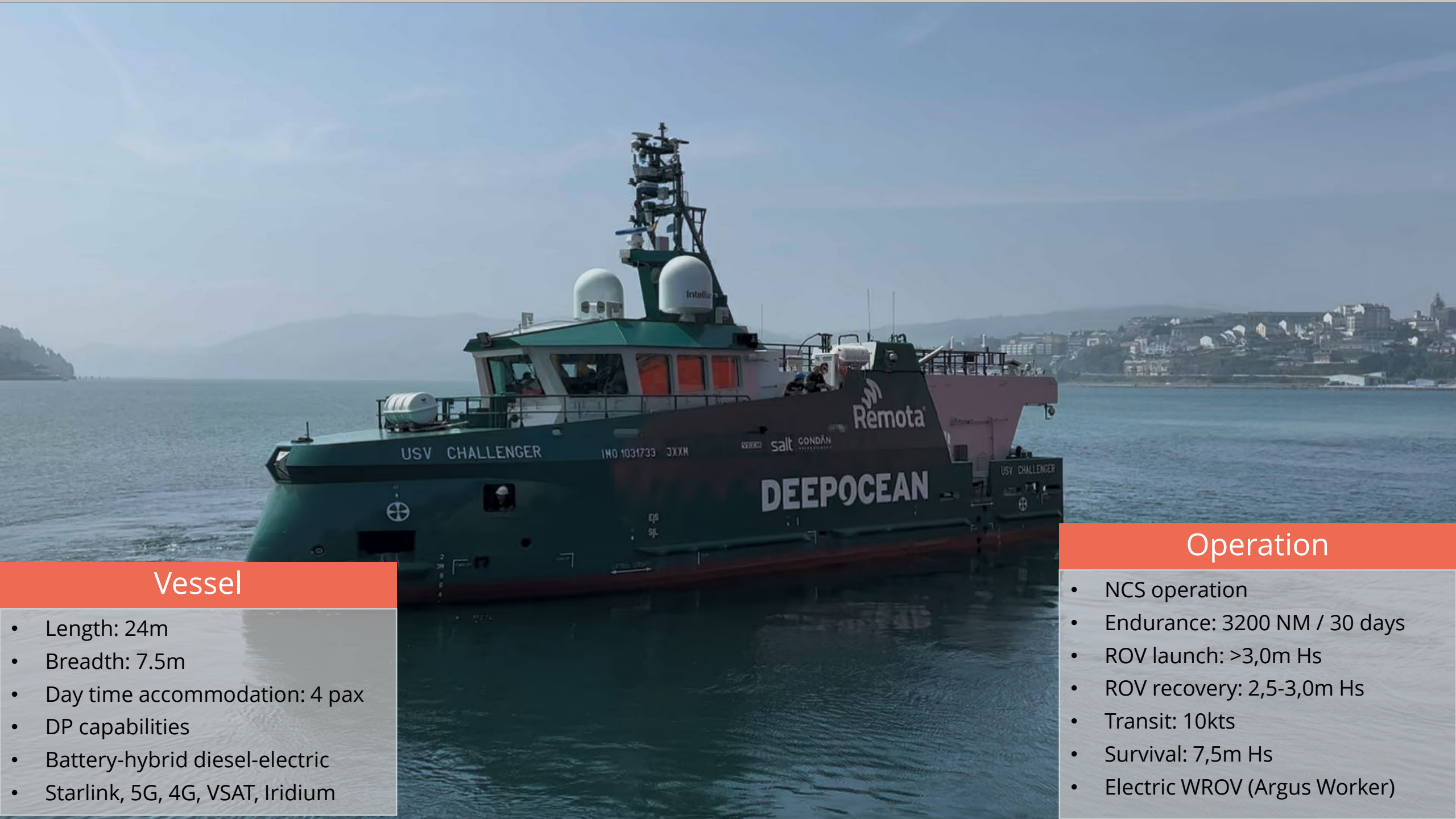


Hydro 2025



The Evolution of Subsea Pipeline Inspection: DeepOcean & USV Challenger





Vessel

- Length: 24m
- Breadth: 7.5m
- Day time accommodation: 4 pax
- DP capabilities
- Battery-hybrid diesel-electric
- Starlink, 5G, 4G, VSAT, Iridium

Operation

- NCS operation
- Endurance: 3200 NM / 30 days
- ROV launch: >3,0m Hs
- ROV recovery: 2,5-3,0m Hs
- Transit: 10kts
- Survival: 7,5m Hs
- Electric WROV (Argus Worker)



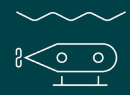
Full lifecycle offering across ocean industries

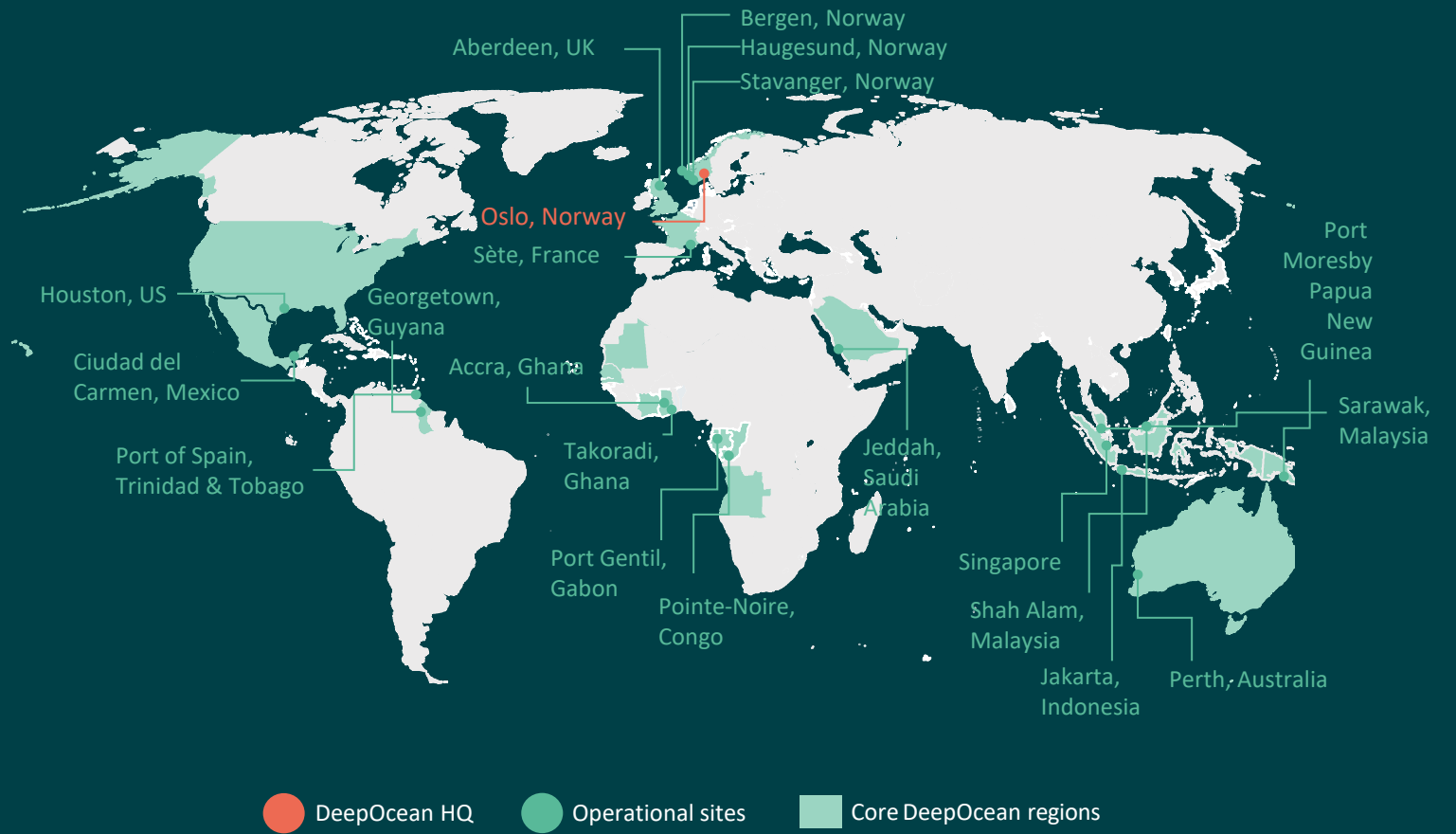
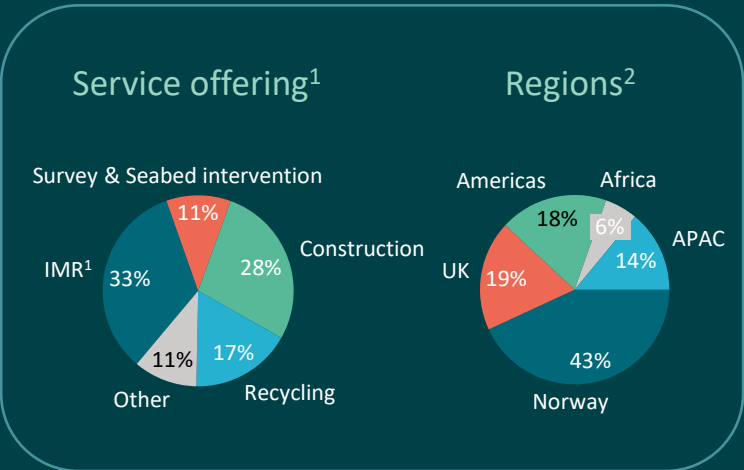
Headquarters: Oslo

Countries: 16

Employees: ~1,800

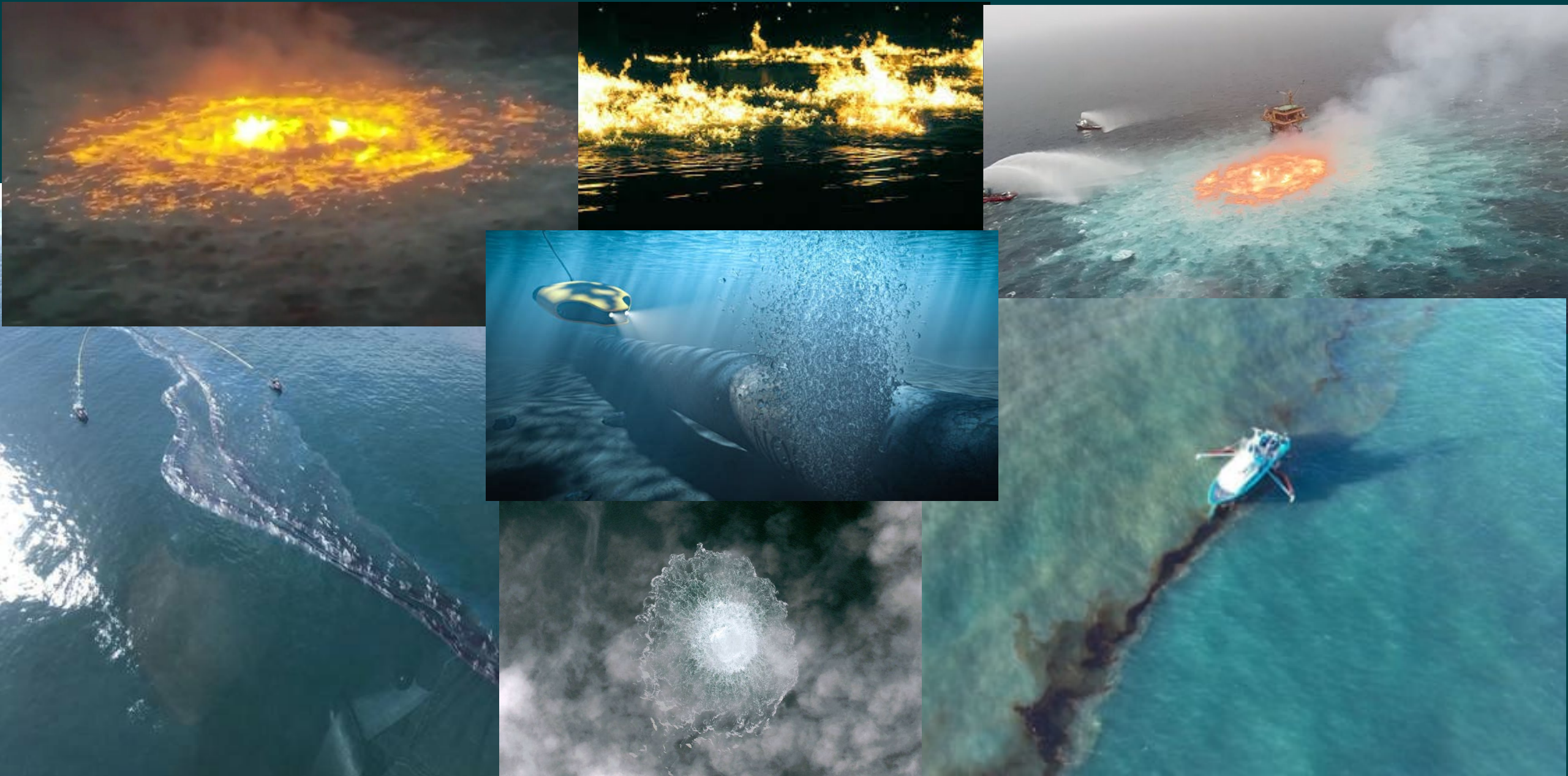
Nationalities: +50





¹ Inspection, maintenance and repair / Excl Shelf Subsea
² FY 2024 Proforma incl Shelf Subsea

Why inspect subsea pipelines

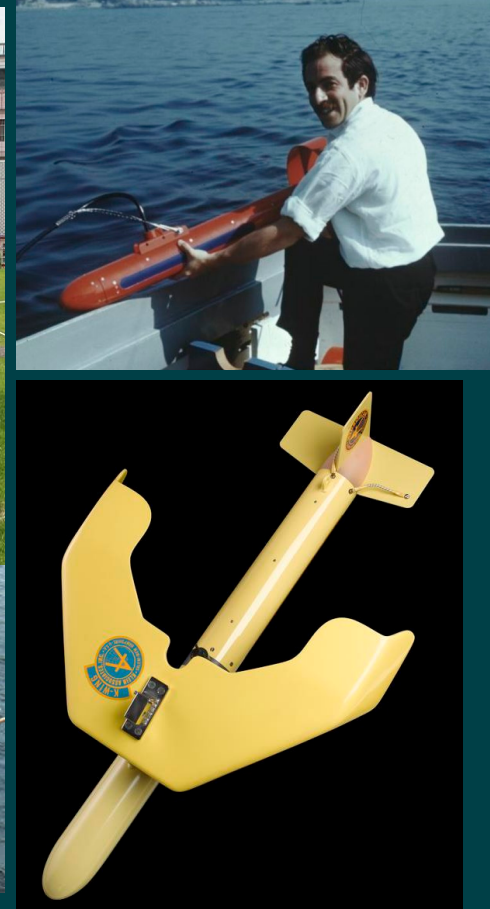


Development of early pipeline inspection methods



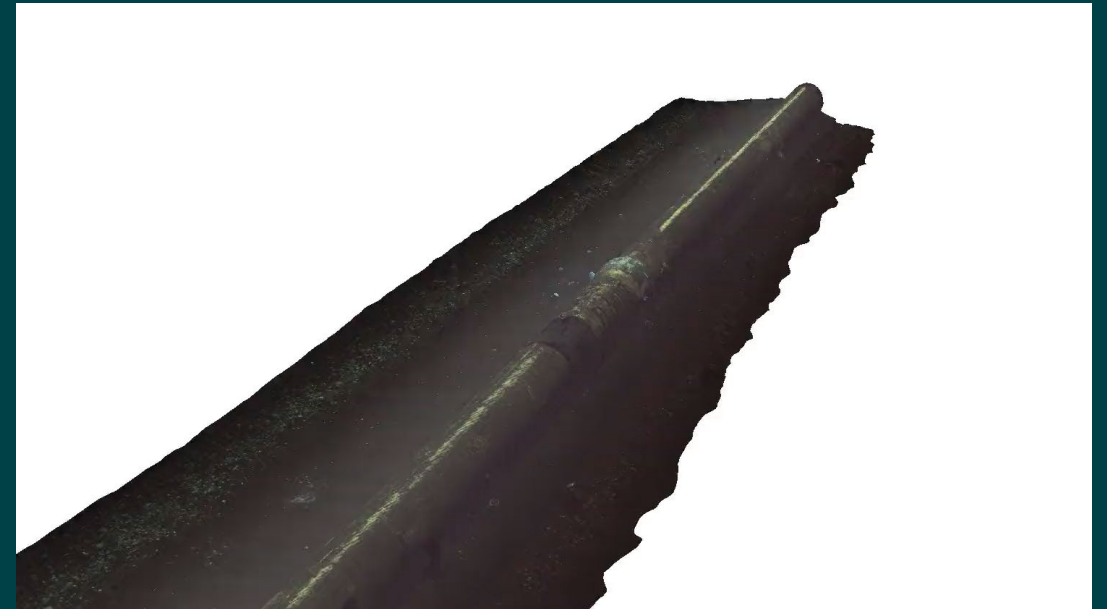
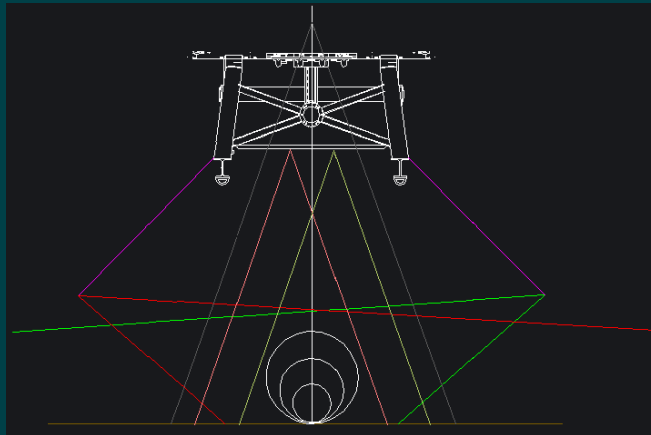
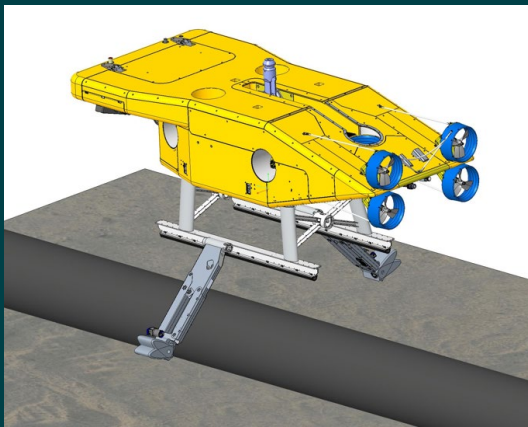
1950s – 1980s



Diver Inspection	Manned Submersibles	Towed Acoustics	Early ROVs
			

DeepOcean's Journey

- 8th April 1999 DeepOcean established
- Pipeline inspection a core service
- Best-in-class inspection technologies adopted
- Acquisition platform innovations – SROV
- Payload innovations
- ~10,000kms surveyed annually
- Production line innovations



The price of innovation

- We work with clients to implement new technologies and methods
- 2015 Superior 01 ROV from Kystdesign delivered
- *A new era of fast ROV survey dawns*
- Fast Digital Imaging (FDI) has been a significant focus
- Working with stills has increased processing time per hour surveyed
- Fly speed up to ~4 knots (2m/s)
- Video review limits speed
- 2024 – 156km visual inspection in a day!
- Optimised offline routines
- High requirement on the offline team



Uncrewed pipeline inspection

- Proximity to the data essential for offline team
- Edda Flora + SROV – up to 6000km annual inspection
- Alternatives to ROV surveys for uncrewed operations
- AUV Pipeline inspection
 - Pros
 - Fast flying
 - Stable
 - No tether –suited to deep water
 - Cons
 - Payload restrictions
 - Cameras
 - No pipe tracker
 - Free span classification
 - Delay in data access
 - Lack of control
 - Re-tasking
- Currently an offshore team required for AUV inspection

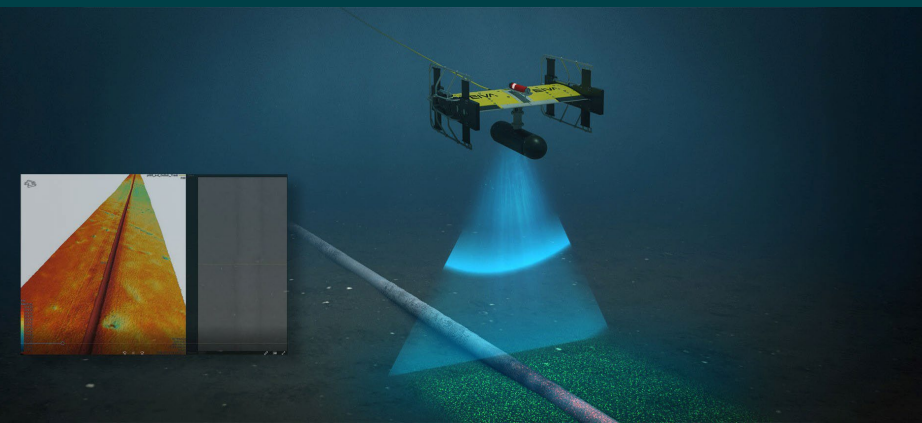
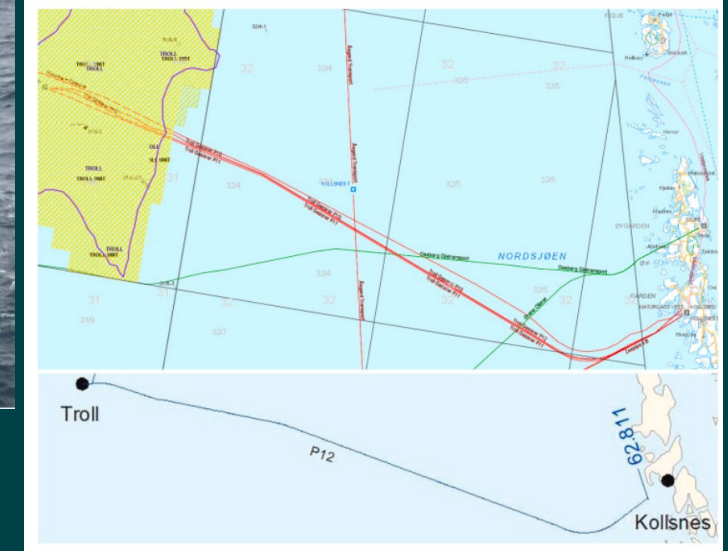
DeepOcean to Provide AUV Survey Services on Libra Field for Petrobras

9 MARCH 2015



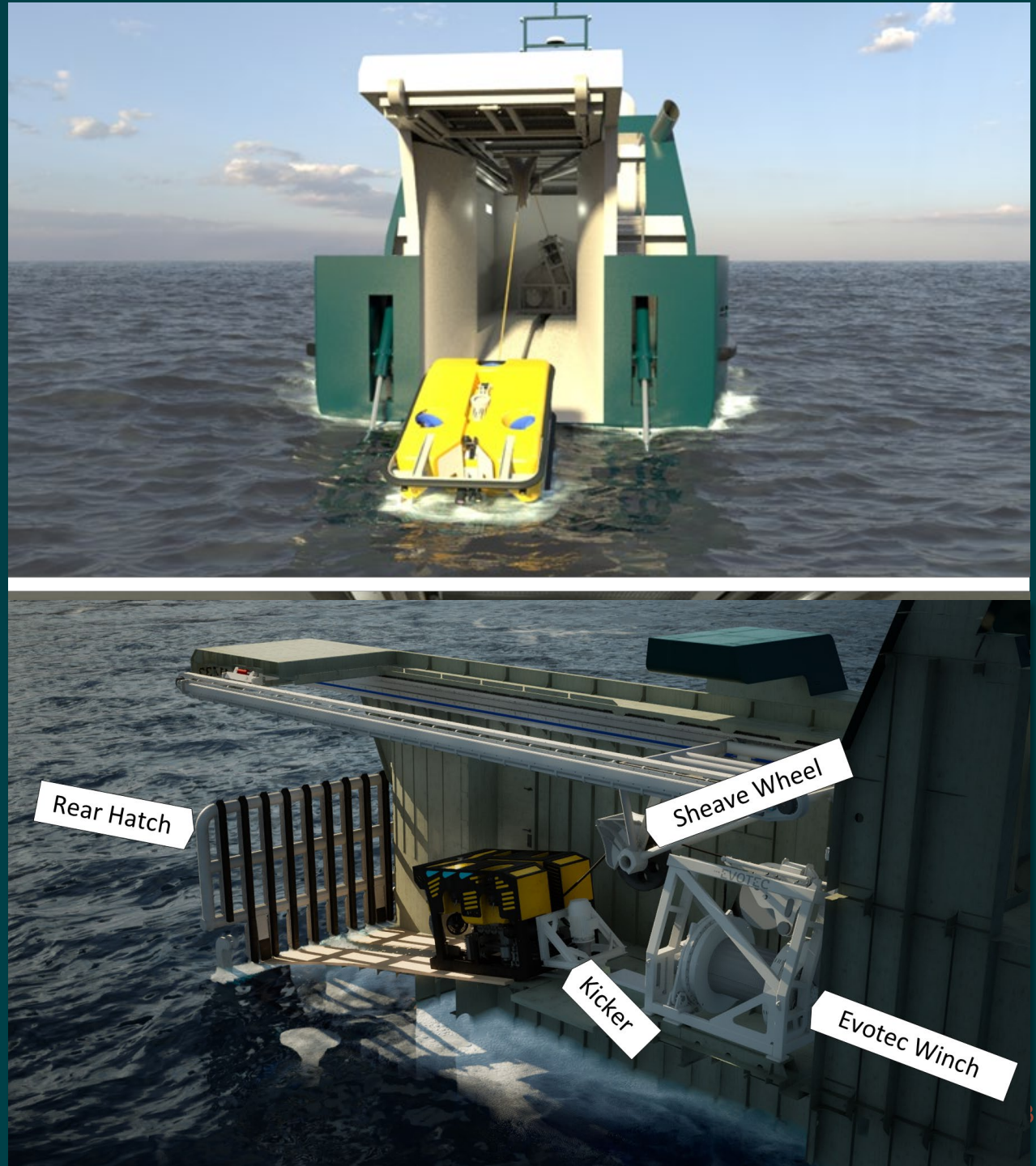
Uncrewed options

- AUV USV
 - Trial project completed 2018/2019
 - Hugin + SEA KIT Maxlimer
 - Single dive missions
 - Usable data
 - Lack of data access
 - No recharging
 - Increase in automation required
 - In water re-tasking
- USV ROTV
 - Payload restrictions
 - Positioning and control limitations
 - Automated Launch and recovery required



USV Challenger

- JV –USV AS
 - Solstad
 - Østensjø
 - DeepOcean
- A pioneer at this scale and level of complexity
- First-in-class technology
- Unique features of USV Challenger
 - In house LARS design
 - Ability to have bridge crew onboard for testing and trouble shooting

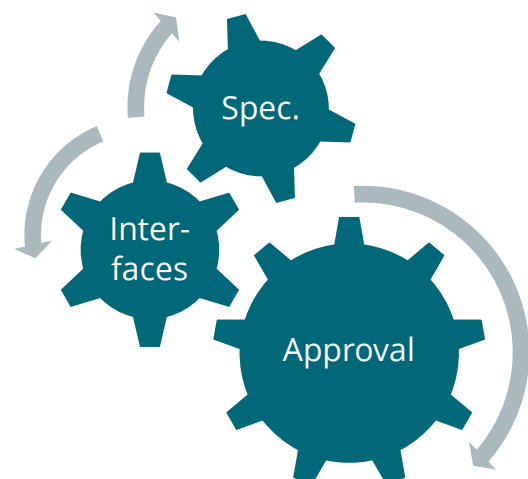




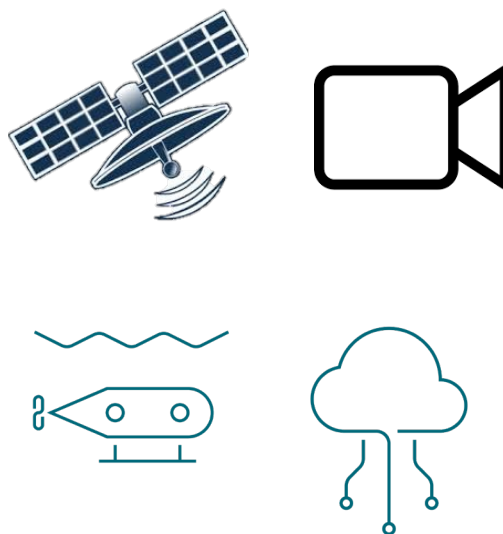
Our method



Integrator role



Technology strategy

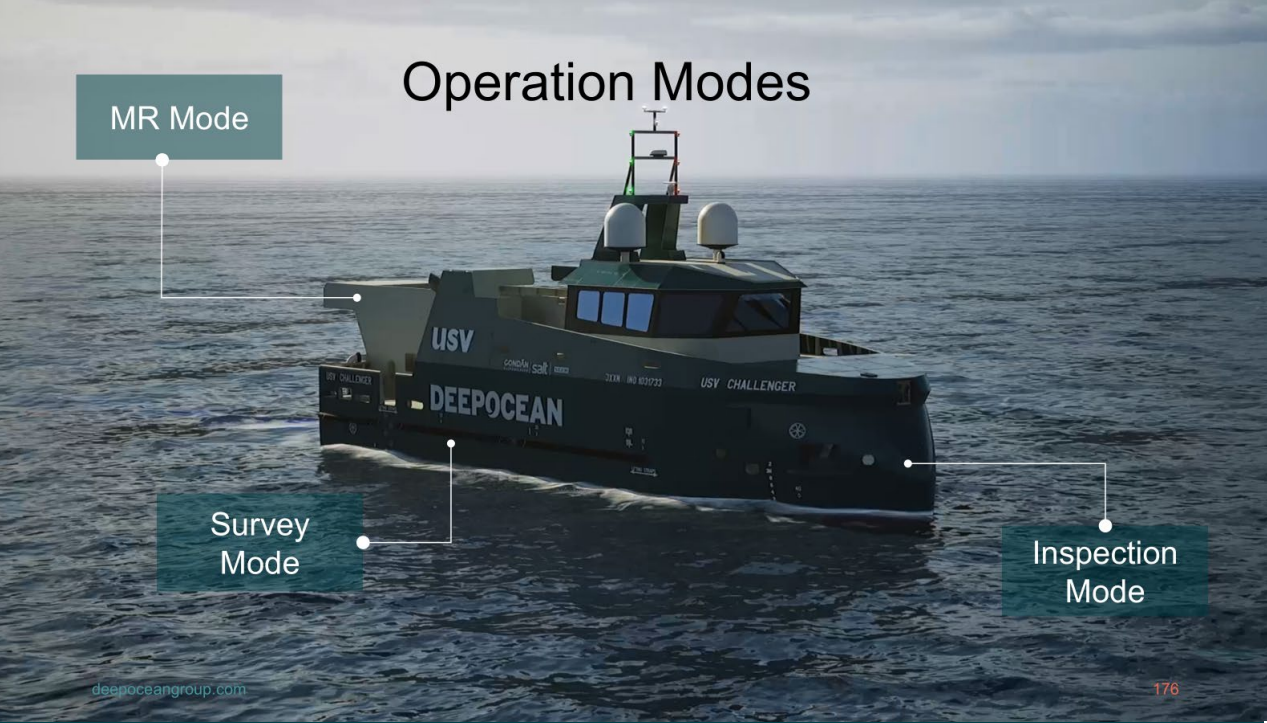


Proficient partners



DeepOcean's Recipe for Remote Survey Success





The future of uncrewed pipeline inspection at DeepOcean





Al Rumson, Remote Survey Solutions Manager

Phone: (+47) 482 82 825

Email: arumson@deepoceangroup.com

deepoceangroup.com