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E-ROV

FFU – seminar day

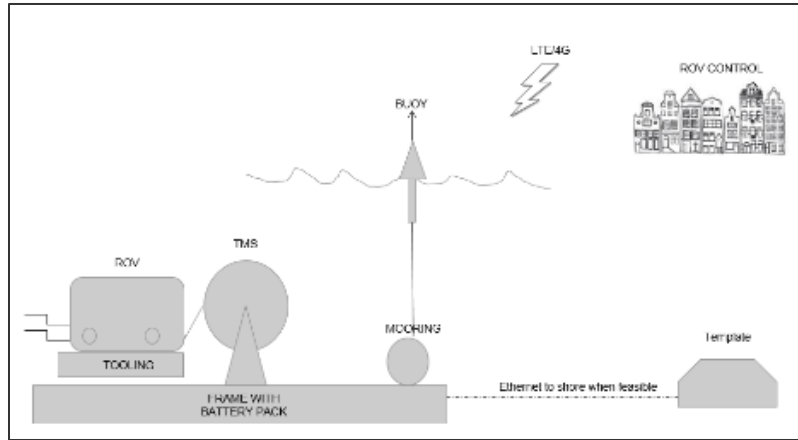
30.01.2020

Georg Johnsen &
Kaj-Ove Skartun

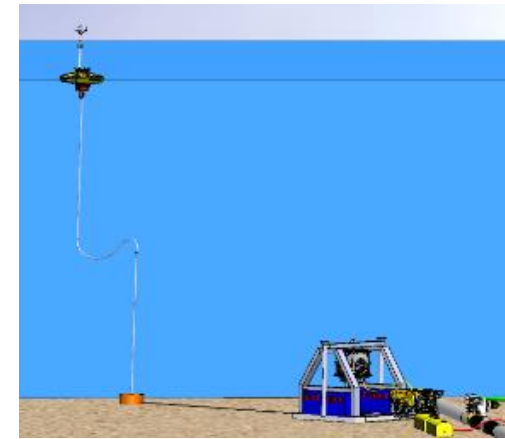


A brief history of the E-ROV system

September 2015:



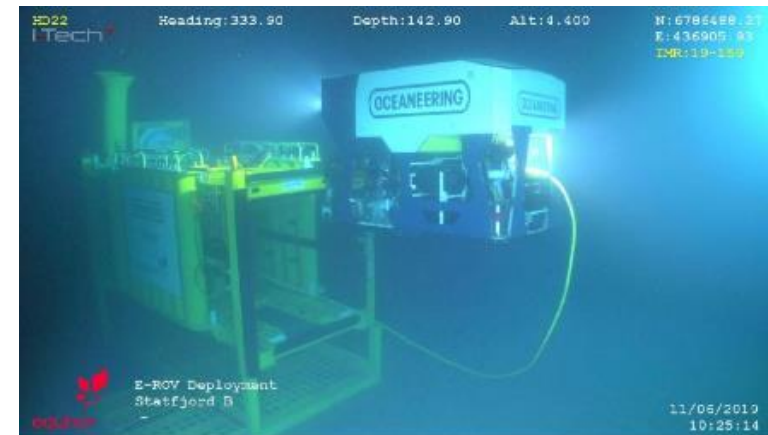
January 2016:



June 2017:

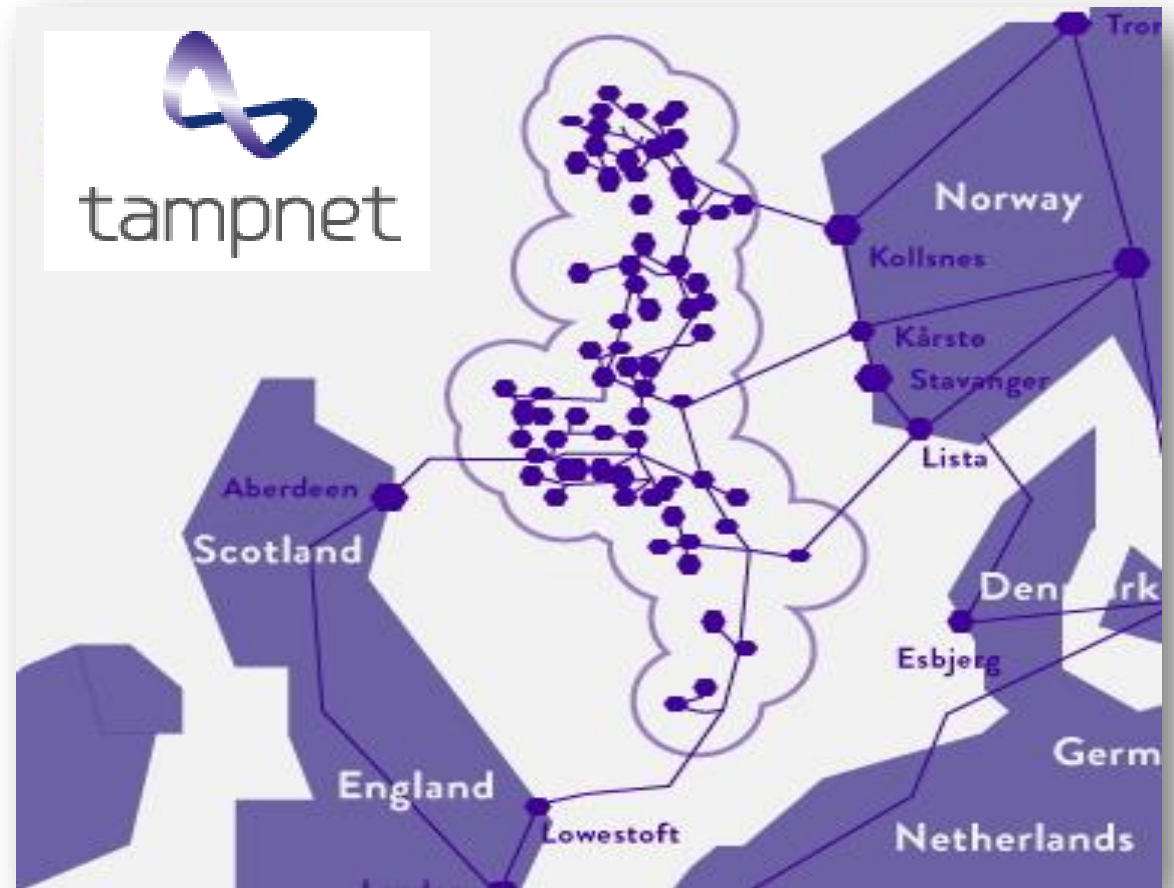
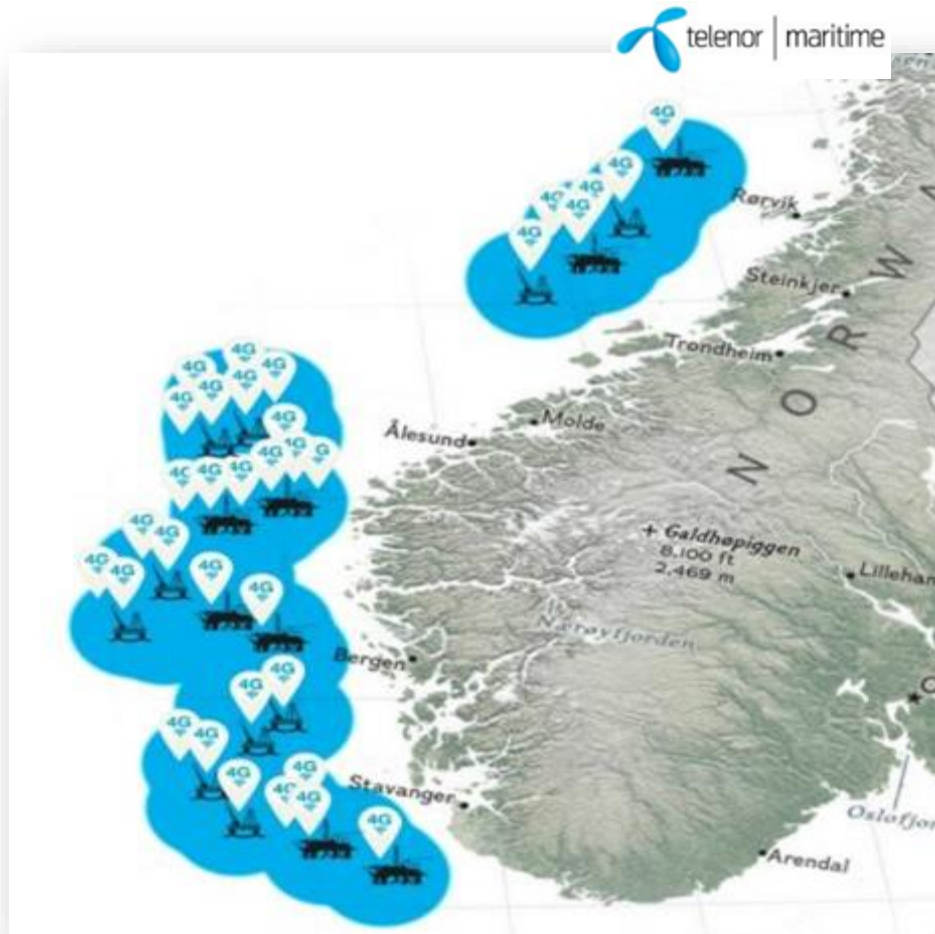


June 2019:



Picture 8: EROV has exited the cage

4G network offshore is the enabler for new remotely operated technology



The E-ROV System: Reduces costs and CO₂ emissions

Alt 1:

ROV operated from a surface vessel

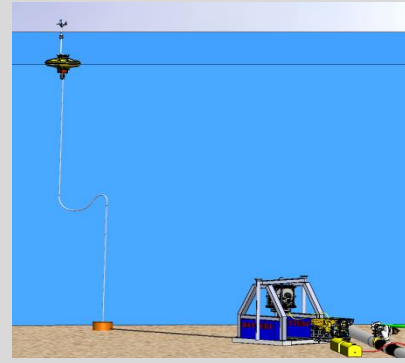
Traditional ROV operation:



Alt 2:

E-ROV with a 4G Buoy

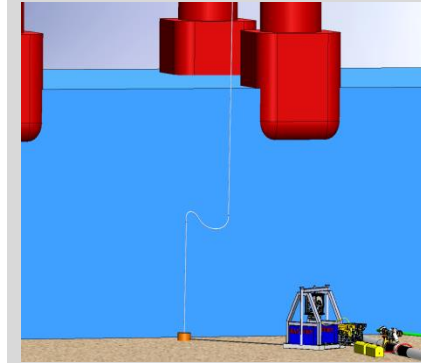
Normal E-ROV operation



Alt 3:

E-ROV connected to a rig or installation

Ongoing E-ROV operation at Snorre A



Cost effective E-ROV operations:

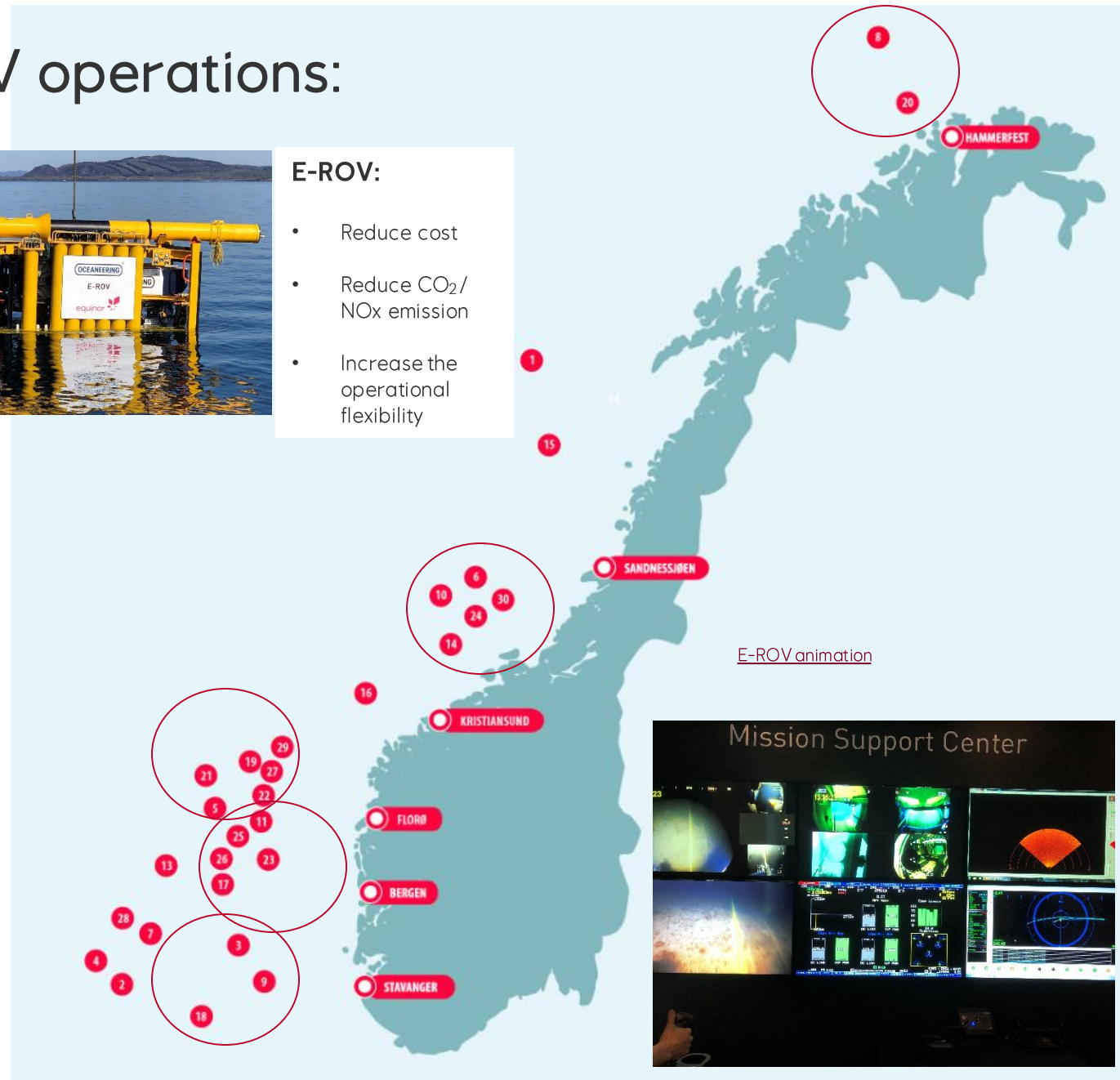


E-ROV:

- Reduce cost
- Reduce CO₂/NOx emission
- Increase the operational flexibility

- Deployed by vessel crane, The vessel may then continue with other operations
- The E-ROV communicates through it's own 4G buoy
- Is self sufficient with it's own battery package
- Remotely controlled from an onshore control room
- May carry out all types of ROV operations where vessel support is not mandatory
- The E-ROV will also carry a fly-out(miniROV) with app. 75m additional radius

- Less HSE risk exposure offshore
- Increased operational flexibility
- Whenever feasible, utilize the Emergency Preparedness vessels for deployment, recovery and charging. They are already paid for



6-7 February 2019
London

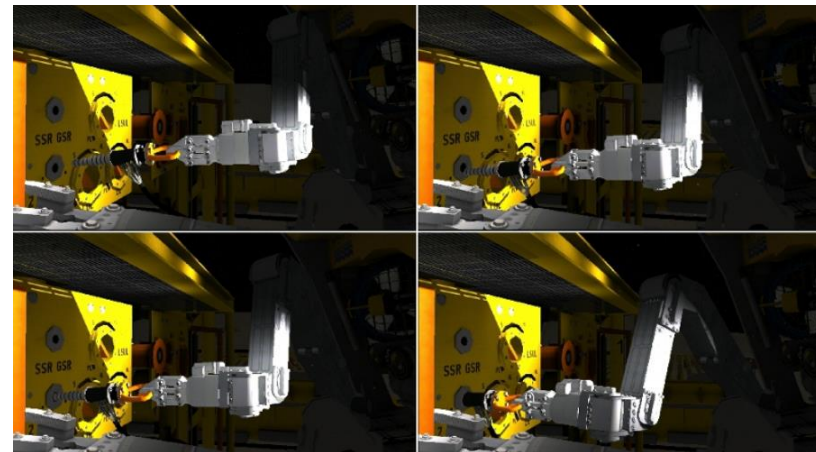
Typical WROV / E-ROV operations

- Manipulator operations

- Hot-stabbing
- Jumper change outs
- Cleaning with rotating brushes
- Valve operations w/manips
- Valve operations w/ torque tools
- Cutting/grinding tool operations
- Connect/disconnect wires/shackles
- High pressure jetting operations
- CP-probing(Cathodic Protection)
- Megging
- Dredging
- Gas sampling / Mud sampling
- Metrology

- Visual inspection

- Jacket inspection
- Subsea template inspection
- Riser inspection
- Anchor chain inspection
- Pig detection/counting
- Condition monitoring
- Leakage detection



E-ROV Operations Start-up 2019

Missions:

- Staffjord B/C - Periodic ROV inspection
- Oseberg A - Periodic ROV Inspection
- Johan Sverdrup - Commissioning
- Johan Sverdrup - Periodic ROV Inspection
- Gullfaks A/C - Periodic ROV Inspection
- Troll A/B - Periodic ROV Inspection
- Fram East – Operation of gas line flapper valve
- Åsgard B – Pipeline leak detection while pressurerising
- Snorre A – Riser Inspection in production startup. (Ongoing)

Operational Stats

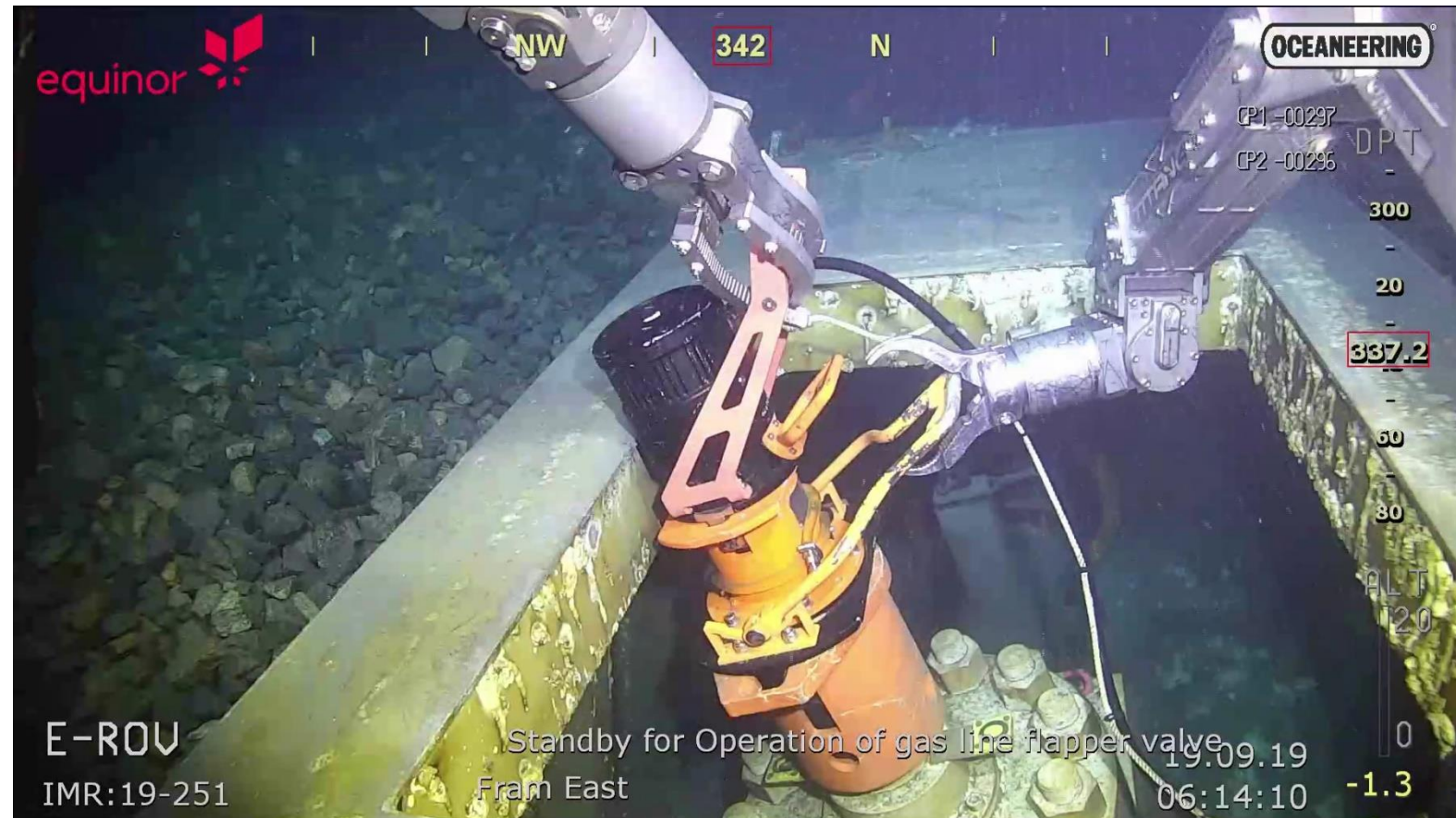
- Number of dives: 19
- Dive time: 1139 hours (48 days)

Johan Sverdrup subsea commissioning in August 2019

Olympic Zeus

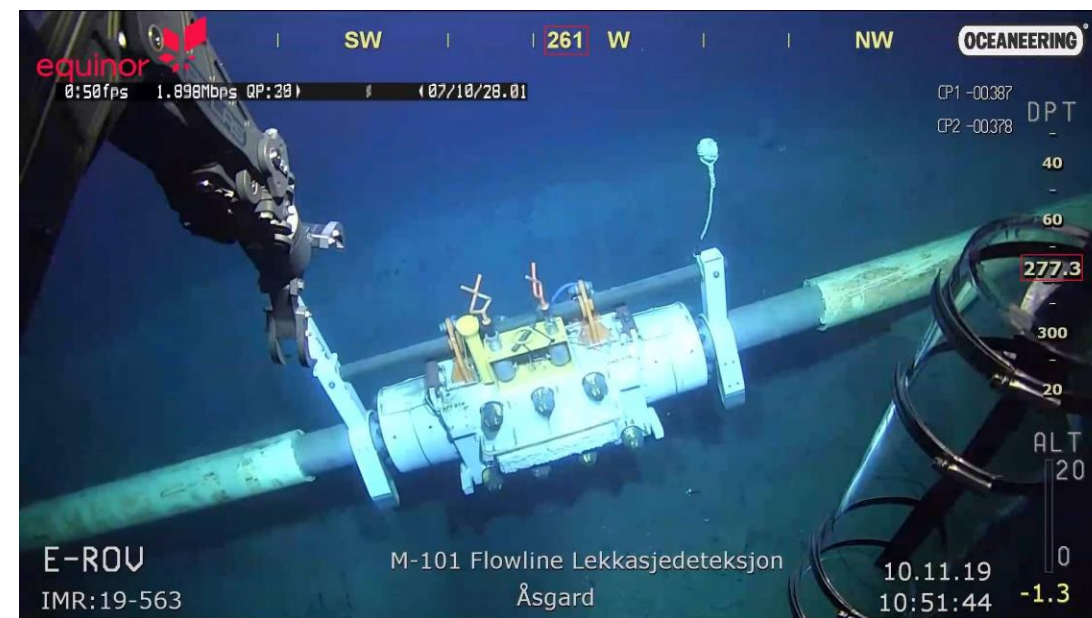
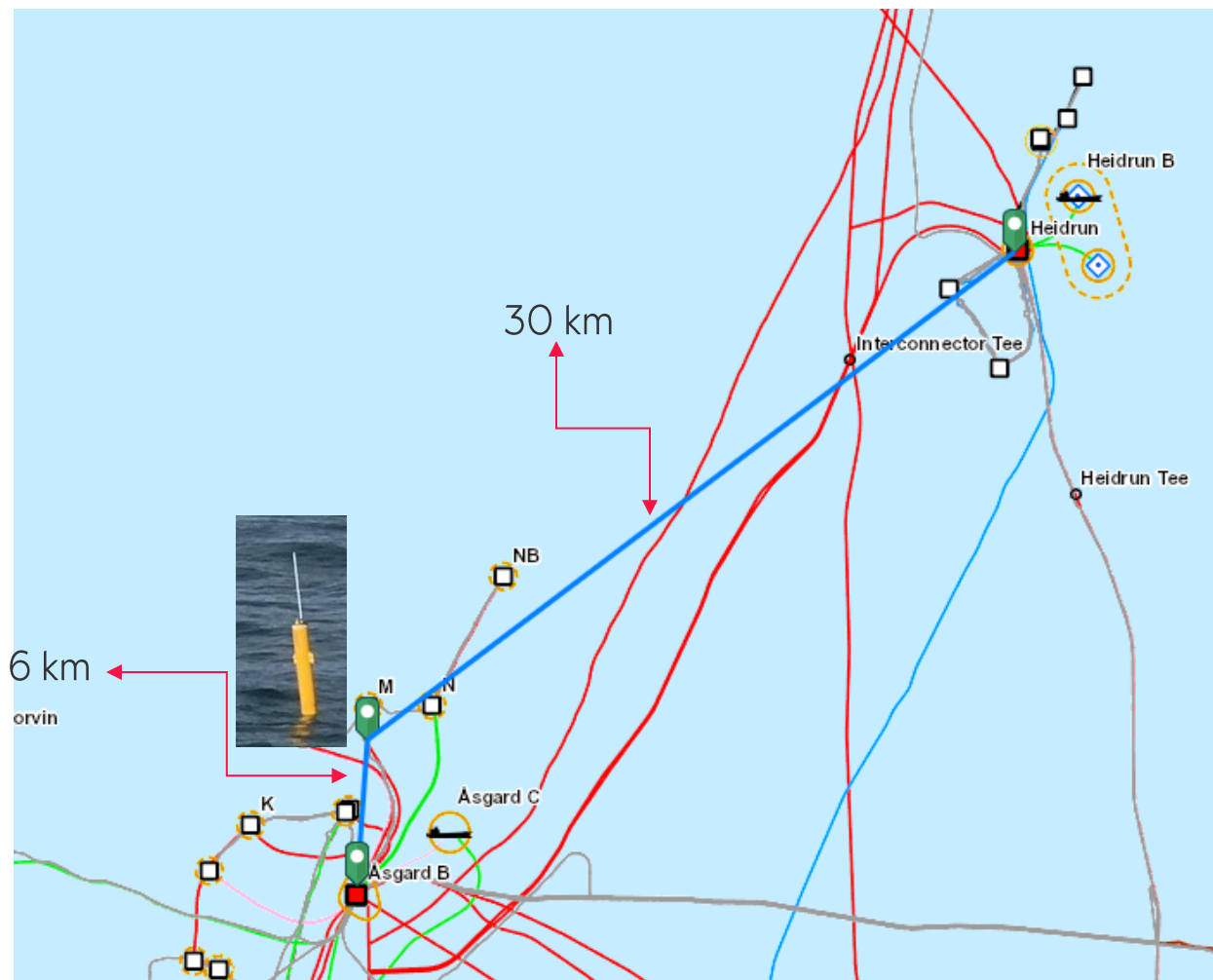


Example of cost saving valve operation: Gas injection valve ops for the Fram field, 9 days duration.



Example of extended E-ROV operation:

Åsgard B – Condition Monitoring of Flowline, 10 days duration.



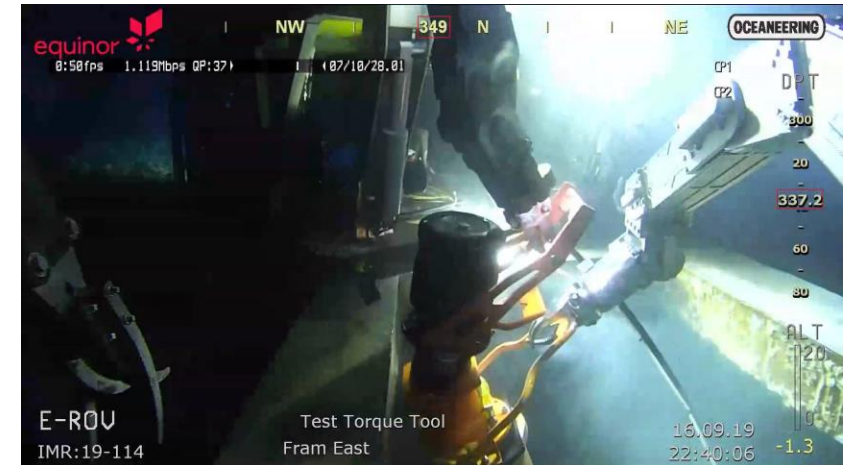


Current assignment: Riser inspection at Snorre A

- Duration : One month + option
- Will have charging power and communication through umbilical from Snorre A
- Consist of one flyby all along the riser every 6-8 hours.
- Will possibly be combined with other periodic inspections in the time between each inspection.

Near Future assignments:

- Subsea inspections
- Commissioning of subsea wells for production after rig operations.



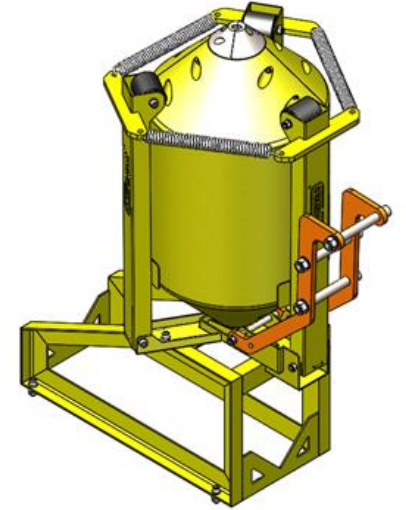
Future possibilities:

- Replace rig ROV's.
- Additional E-ROV, will open for redundant operations.



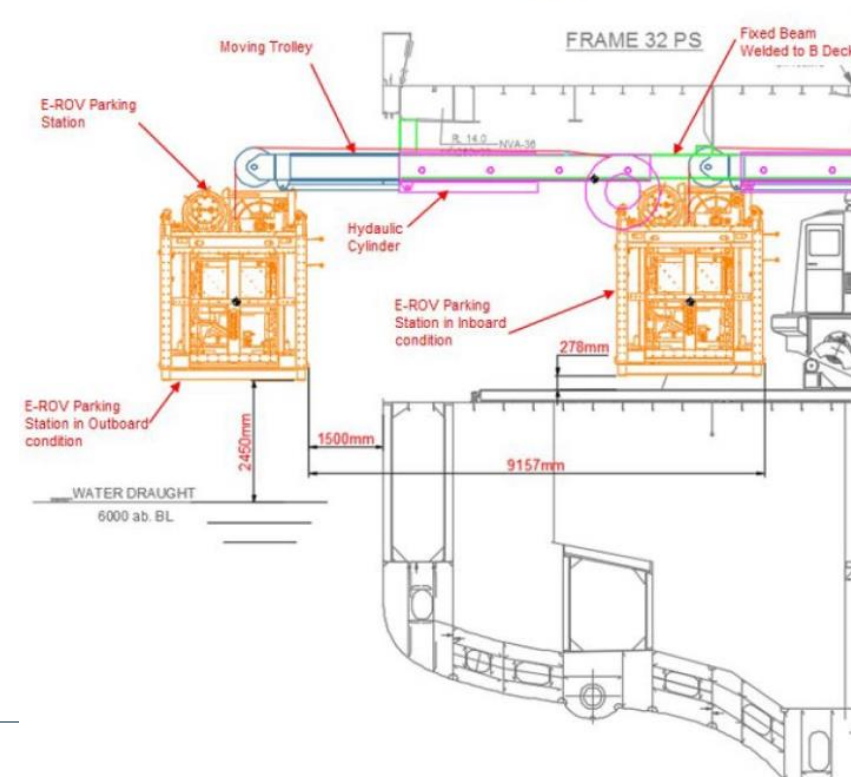
Improvements ongoing :

- Flyout BLUEROV.
- Improved semi automatic buoyancy solution, to reduce deployment and recovery time.
- 4G test suitcase to test each location 4G coverage before operation.



Improvements under evaluation :

- Wifi in crane arm for communication under deployment and recovery.
- Deployment from emergency preparedness vessels.
- Mounting of additional 4G antennas on strategic locations.



There's never been a better
time for **good ideas**

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