



How to use offshore oil and gas experience in the offshore wind industry?

✓ High and low with LBO

Sivert Sande

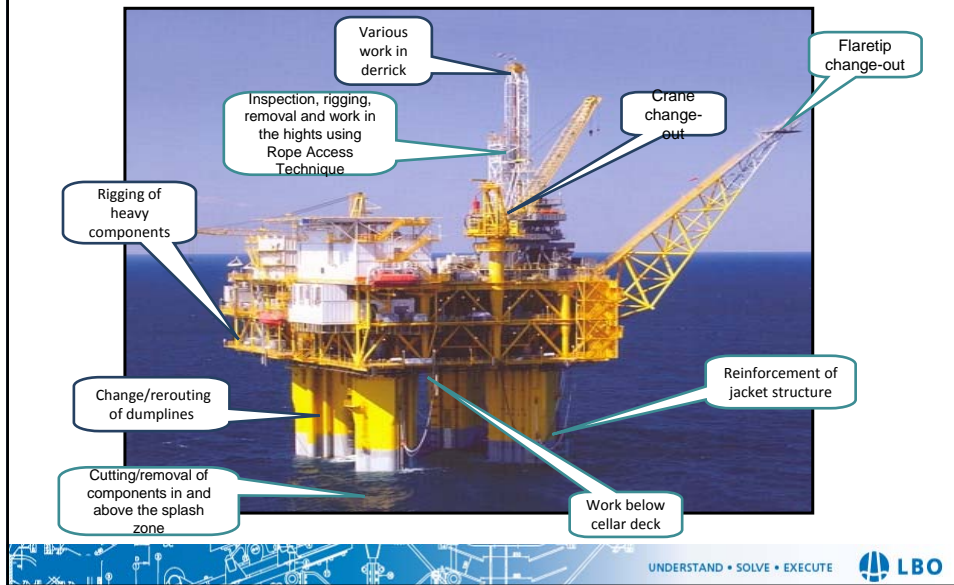
Linjebygg Offshore AS

Who and where are we?

- Norway - Molde (HQ)
- Trondheim (Engineering Office)
- Stavanger (Project Office)
- Scotland - Aberdeen (Agent)
- USA - Houston (LBO Inc.)
- 450 employees

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## Taking care of the inaccessible work places




How to reach the inaccessible places?

Rope Access Technique (RAT) is our tool for that ..

... what is RAT?

Methods where rope and climbing techniques are used as the major remedy for access and securing of personnel for execution of various work tasks.






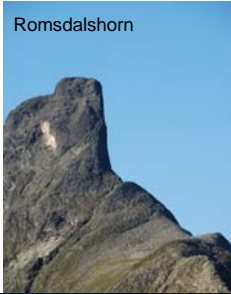
When using Rope Access Technique you are:

- ✓ Always secured during access and execution
- ✓ Holding a personnel skill that can not be split from the execution of the work
- ✓ Connected by ropes to two independent safety appliances at all times
- ✓ Working according to extensive procedures, and all operations are properly described and quality assured
- ✓ Familiar with and thoroughly trained according to procedures for safe rescue in all situations


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Rope Access relates to mountain climbing. Mountain climbers are an important recruitment resource base for LBO.




Romsdalshorn




Trollveggen



Store Vengetind



LBO Engineer climbing Romsdalshorn

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Rope Access Technique  
... and why did LBO start with this?



First mission in 1991:  
Inspection of boatbumpers at the Ekofisk field, triggering the removal of more than 50 of the kind



- ✓ Inspection and various other type of work can be made "anywhere"

Up in the flare stack



Below deck



Down in the splash zone

- ✓ Inspection can be made "anywhere"

Drilling derrick



Wind braces in the flarestack



- ✓ Inspection and repair can be made "anywhere"

Concrete chassis



- ✓ High

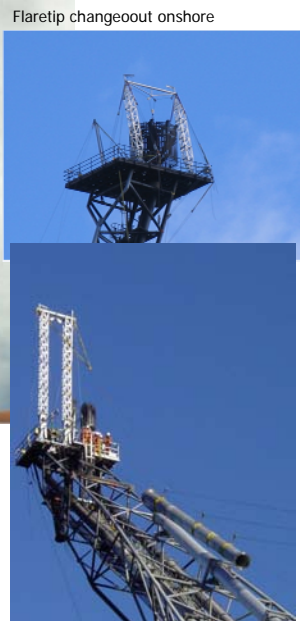
Flaretip changeout offshore



Flareboom work offshore



Flaretip changeout offshore

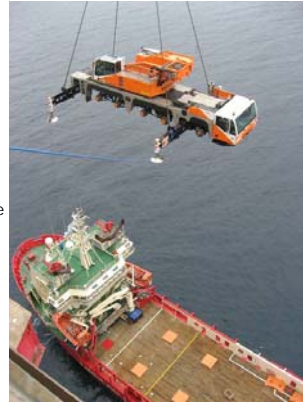


Flaretip changeout onshore

✓ On deck



Exchange of platform crane



Below deck



Removal of conductor frame



Installation of wave protection



Installation of conductor frame

- ✓ In the splash zone (wave zone)

Installation of steel structure

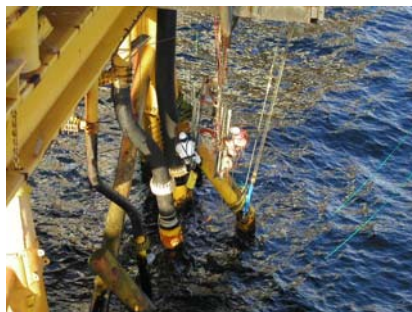


Cutting / removal of structures



- ✓ In the splash (wave) zone

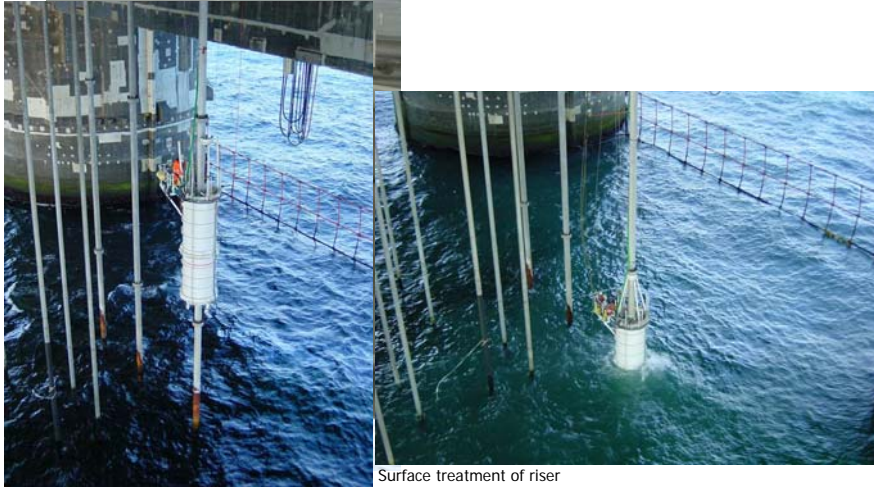
Dismounting of riser protection



Mounting of riser protection

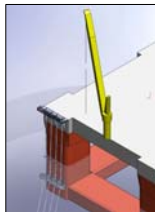


✓ In the splash zone



Various tools developed for safe access and work

✓ In the splash zone



Manipulator arm normally used on ROV's, installed at an "access tool" and remotely controlled from an instrument container on deck

What can be achieved by using LBO techniques and methods?



An oil and gas platform and an offshore wind turbine will have much the same impact from a harsh environment . . .and both require current and planned maintenance at a lowest possible cost. LBO intends to earn its money by saving costs for its customers. We believe this is also of great importance to the offshore wind industry.



*Thank you for your attention!*



**Any questions?**

