

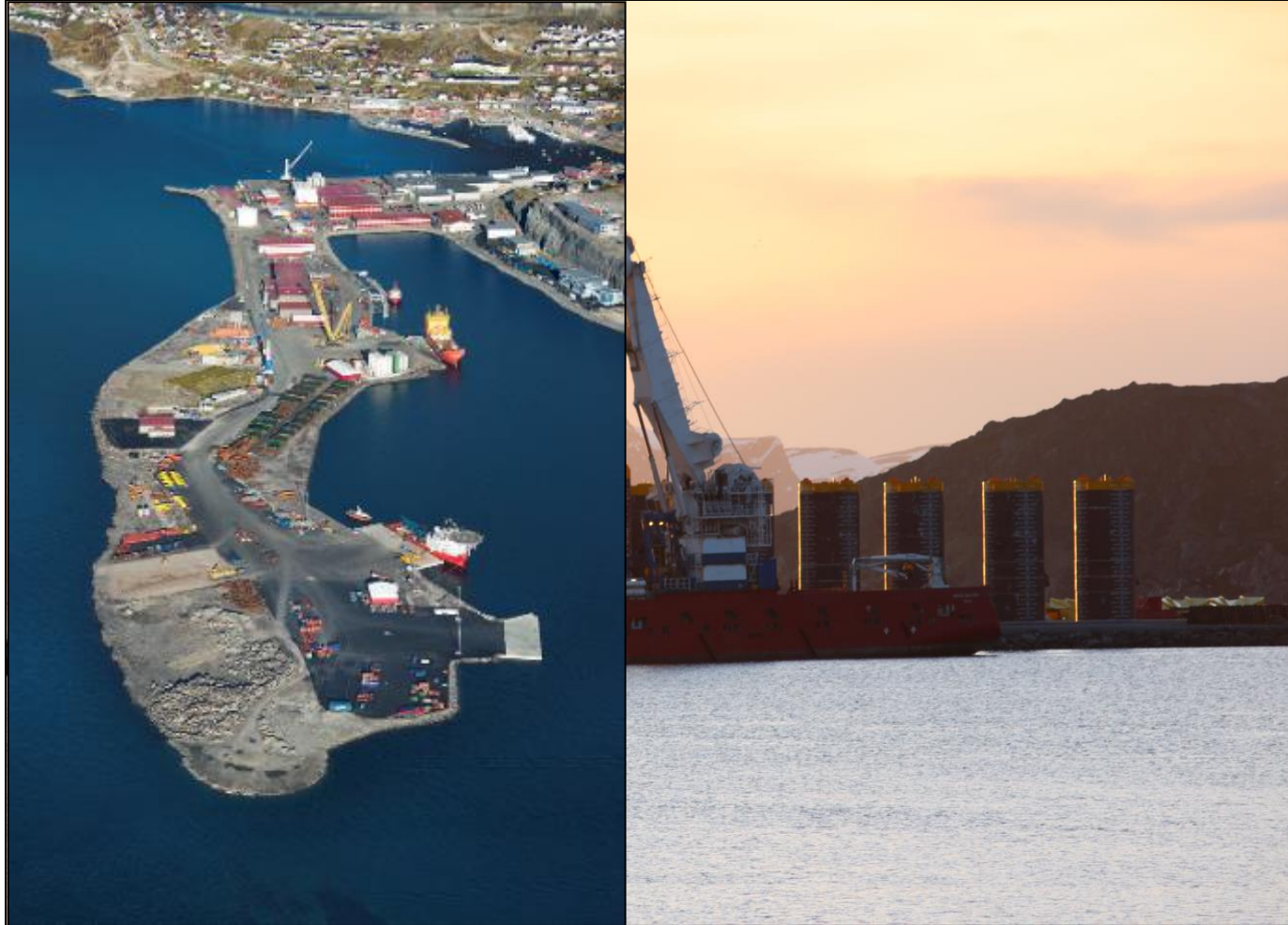
Goliat FPSO Marine Installation – Execution Highlights and Learnings

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DOFsubsea
delivering solutions at any depth

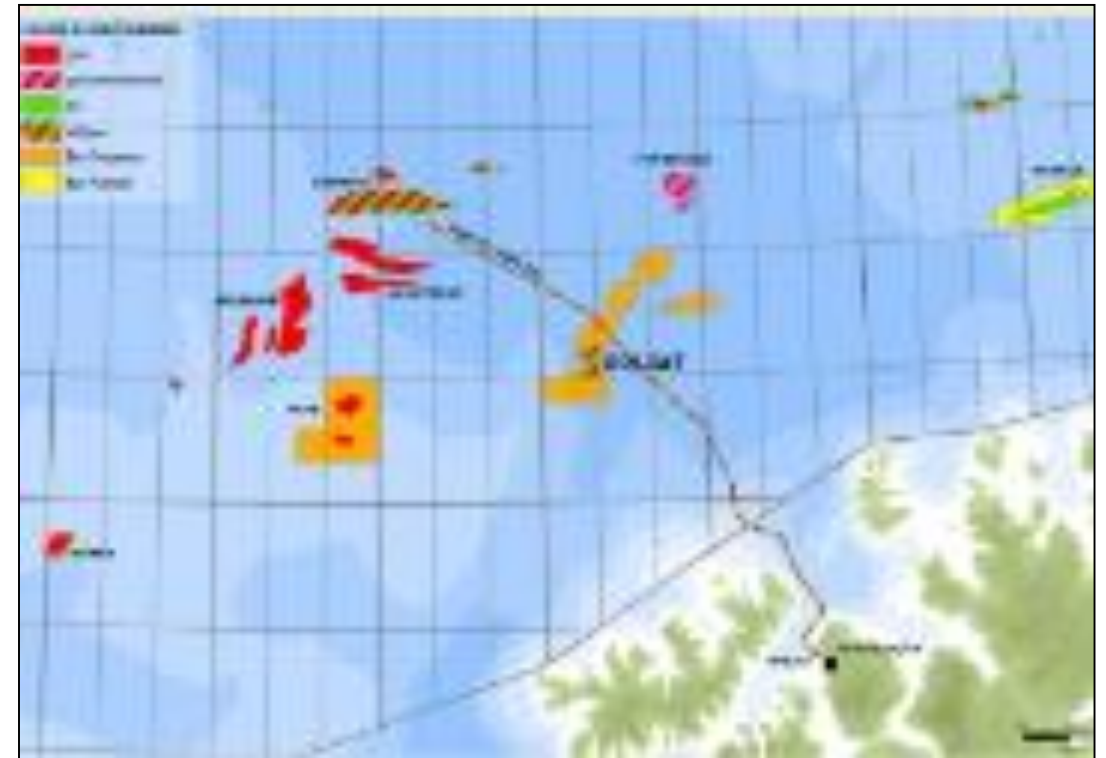
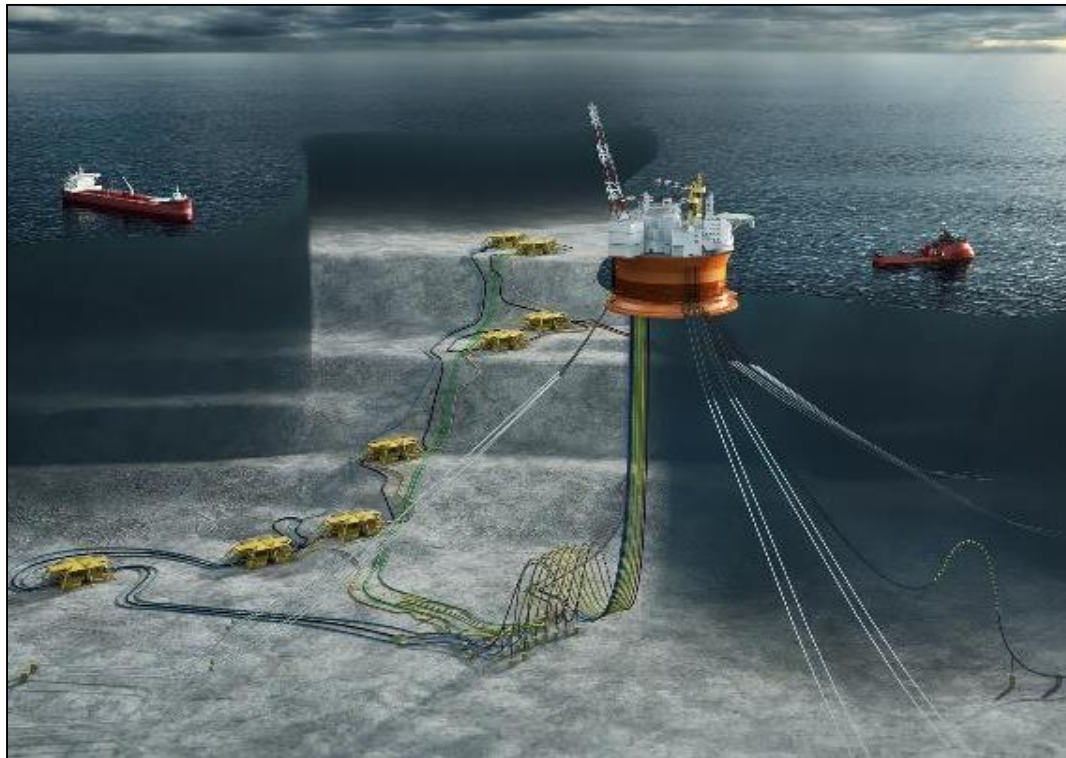


Hammerfest Site



Field Lay-Out

- 14 Anchors in 4 + 4 + 6 clusters
- Unsymmetrical line/cluster configurations – Chain, Fibre, Buoyancy elements
- Existing Infrastructure



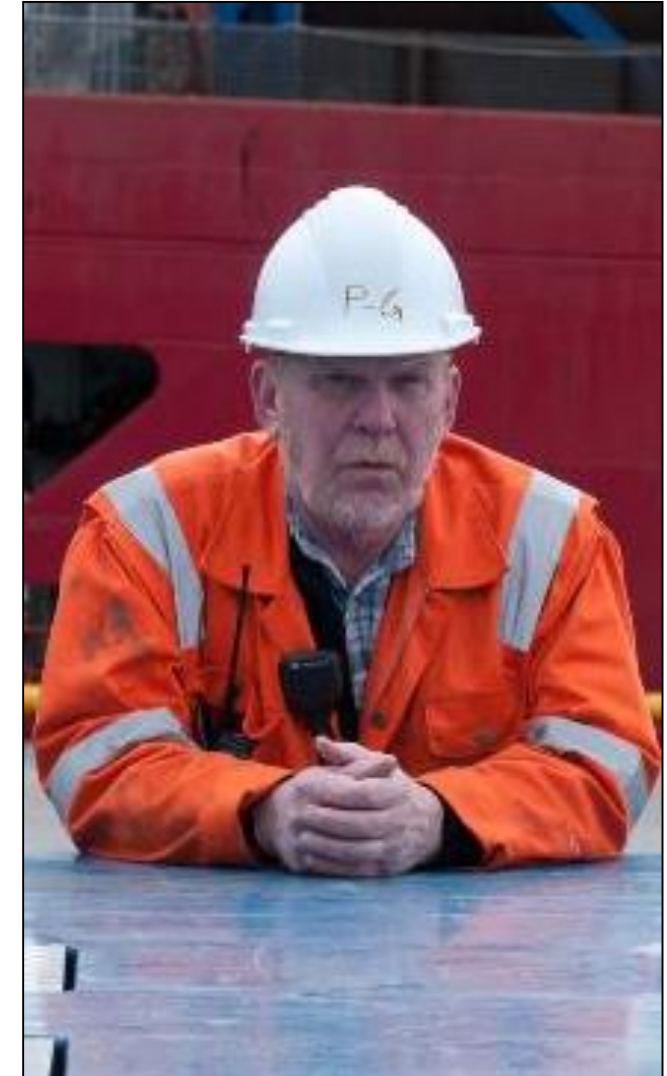
Main Achievements

- Offshore Towing: Start 07.05 @ 04:50, at target: 08.05 @ 01:30
- Safe Mooring: Start 08.05 @ 01:30, 6 lines on: 10.05 @ 18:35
- All lines connected: Start 08.05 @ 01:30 all lines on: 16.05 @ 09:59
- Tensioning: Start 12.06 @ 09:08 competed: 14.06 @ 22:10



Philosophies and Basis

- DNV RP H101 – Risk Management in Marine- and Subsea Operations
 - Minimize Manual Handling
 - Proven and robust methods and design
 - ALARP Principle
 - Clear “Safe Hold Conditions”
 - Avoid parallel operational activity
- “One Team Approach”
 - Target ownership, relations and commitment;
 - Client
 - Contractors
 - SubContractors
 - Third Parties
 - All involved early
- HSE Focus
 - Continuously focused from day one
 - Always on the agenda
 - Allocated resources

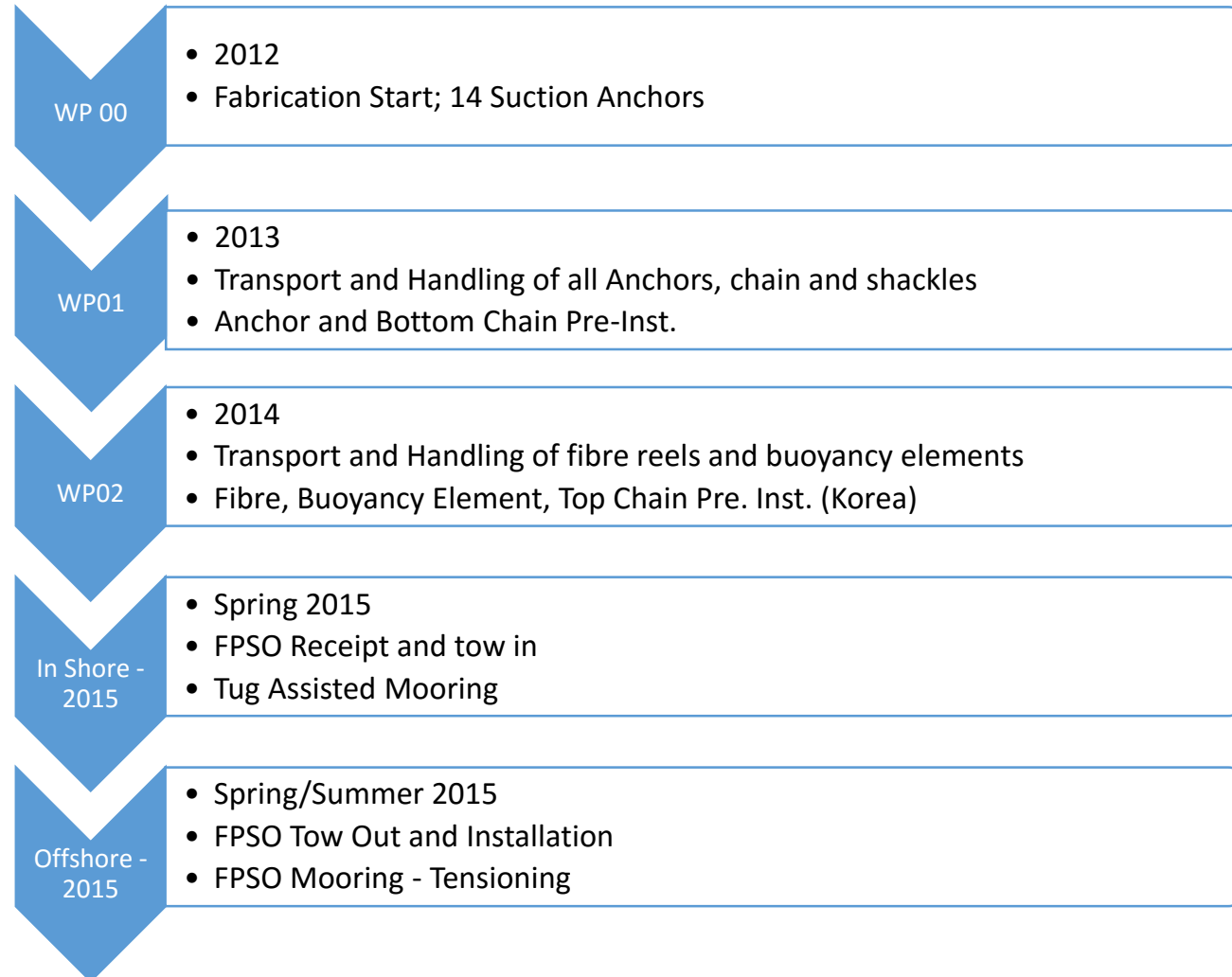


Testing and Training

- Testing, training and verifications
 - Visit and Inspect equipment and sites
 - Verify and test properties and functionality
 - Training and familiarisations



DSNO Marine Installation Scope



WP01

- Summer / Autumn 2012
- Anchor Fabrication (Finland)



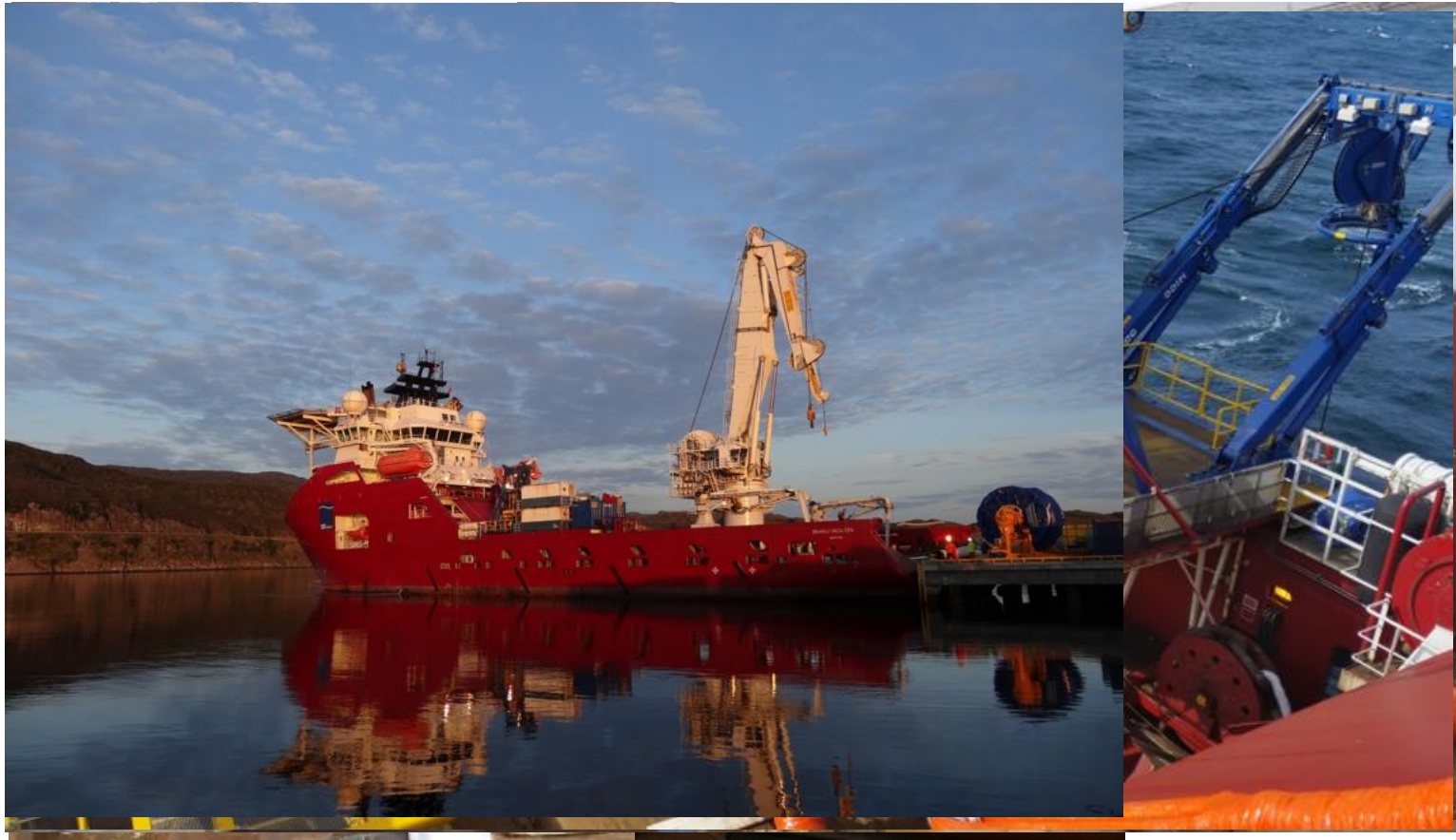
WP01

- Spring 2013
- Anchor and Bottom Chain Pre-Inst.



WP02

- Summer 2014
- Fiber, Buoyancy Element, Top Chain Pre. Inst.



WP – In
Shore

- Spring 2015 – FPSO Receipt
- Inshore Tug Assisted Mooring
- Offshore Towing and Installation



- Pre – Installation of Inshore Mooring in Hammerfest
- Preparations of FPSO on Vanguard
- FPSO Tow In
- Install and Maintain FPSO in Inshore Mooring
- Release and Tow Out of FPSO

WP – In
Shore

- Preparations on DW Vanguard



WP – Off
Shore

• FPSO Installation in Offshore Moorings

- Two Installation Vessels
- Four Vessels for station keeping
- 3 Teams each shift for operating winches



Success Criteria

- One Team Approach
- Attention to details
- Testing, Training and inspection/involvement
- Robust Design and Contingency philosophy
- Robust manning



Client Relations - Experiences

- Excellent through four WP's and three Offshore Campaigns
- Genuine "One Team Approach"
- Excellent relationship characterised by;
 - Mutual trust and support
 - Honest and without any hidden agenda
 - Open communication
 - Benefitted both Eni and DSNO



SubContracting - References

Sub-Contractors nominated and selected based on;

- Recognized and proven records
- Compatible HSEQ policies and system
- Committed and proactive ~~and involved~~
- Commercially competitive
- Continuity and key personnel flagged as important

SubContracting - Experiences

- “One Team Approach” conveyed towards Contractor
- Schedule, progress and marked monitored
- Involved early (enough) for;
 - DSNO to familiarise with Contractor
 - introduction, familiarisation and testing
- All Sub-Contractors performed well (exceptionally), all in a proactive and positive manner.
- No HSEQ issues
- All flexible (under challenging conditions)



Happy times!



Thank you!

