

HV Dynamic Cables for Floating Wind and FPSOs electrification

Floating Energy Research Forum 2024



Nexans G&T - Key facts & figures

CO-CREATION OF VALUE WITH CLIENTS

Focus on frame agreements and long-term partnerships with selected clients in Europe and the US

2,800

Employees in G&T

4 HV plants

€1bn~

Invested since 2018 to increase capacity in Manufacturing & Installation with a focus on HVDC expansion

Backlog in G&T

€6bn+

2 vessels

+ 1 additional CLV under construction
+ 3 barges



CLV NEXANS AURORA



CLV NEXANS ELECTRA



C/S NEXANS SKAGERRAK



HV Dynamic and Static subsea cables

PIONEERING FLOATING WIND

Technology developed for the oil & gas market

- Dynamic power cables – since 1983
- Dynamic power umbilicals – since 2007 (King, Jack & St Malo,...)
- Direct Electrical Heating solutions – since 2000 (Asgard, Kristin,...)
- Power-from-shore & Subsea compression – 2025 (Jansz-IO)

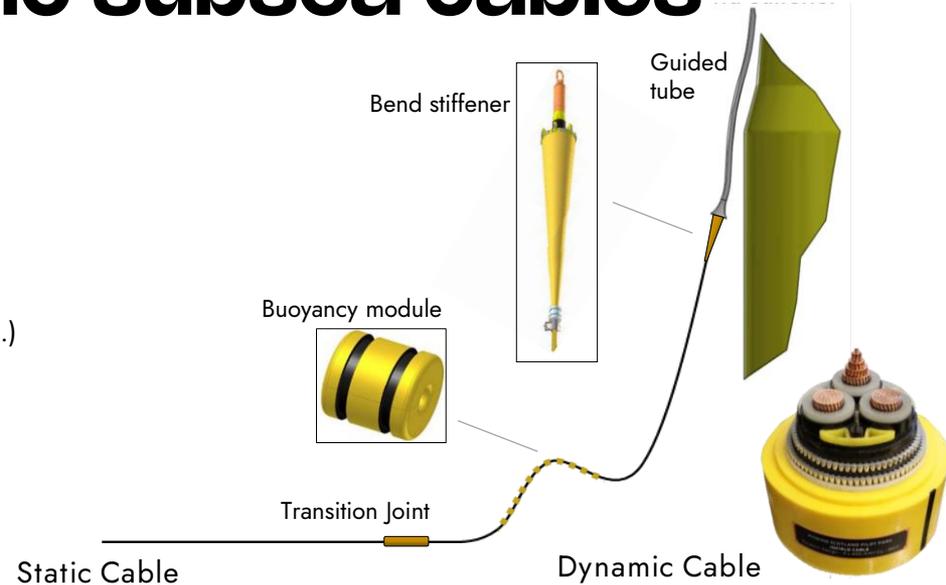
Dynamic cables for floating offshore wind

- 2009: Hywind Demo : World's first floating wind turbine
- 2017: Hywind Scotland : World's first floating wind park

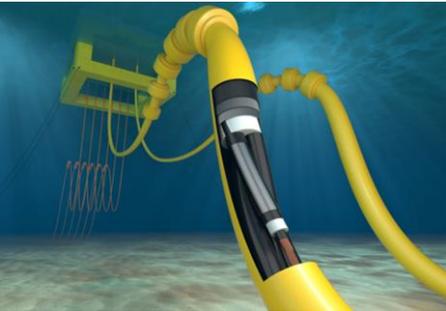
OFFSHORE WIND EXPORT CABLES

Qualified static cables

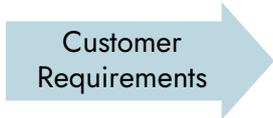
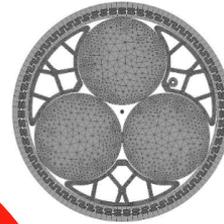
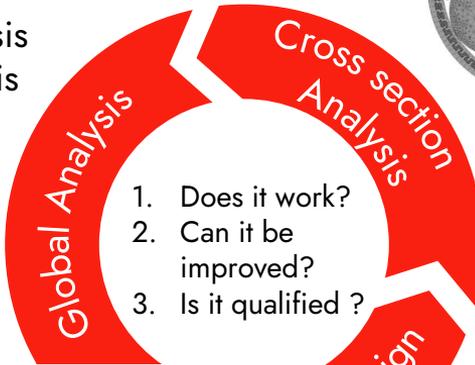
- HVAC: up to 420 kV (1 core and 3 Core)
- HVDC: up to 525 kV



Dynamic cable benchmark is an iterative process



- Extreme Analysis
- Fatigue Analysis
- FEA, CFD..



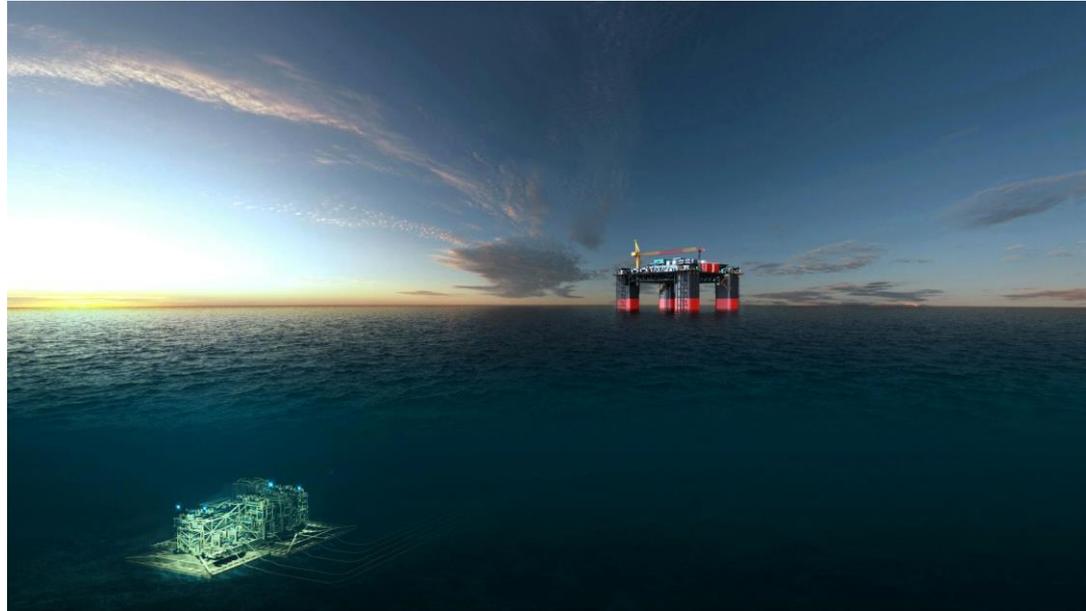
2 Adc 150 BS in this model minimize current	Also consider buried dynamic cable	Most significant contributor to charging current. Minimize if possible	High ambient temp and deeper burial near shore.	HCO water-filled.	HCO air-filled if protected at.	No optimization in the study phase.



Jansz- IO overview

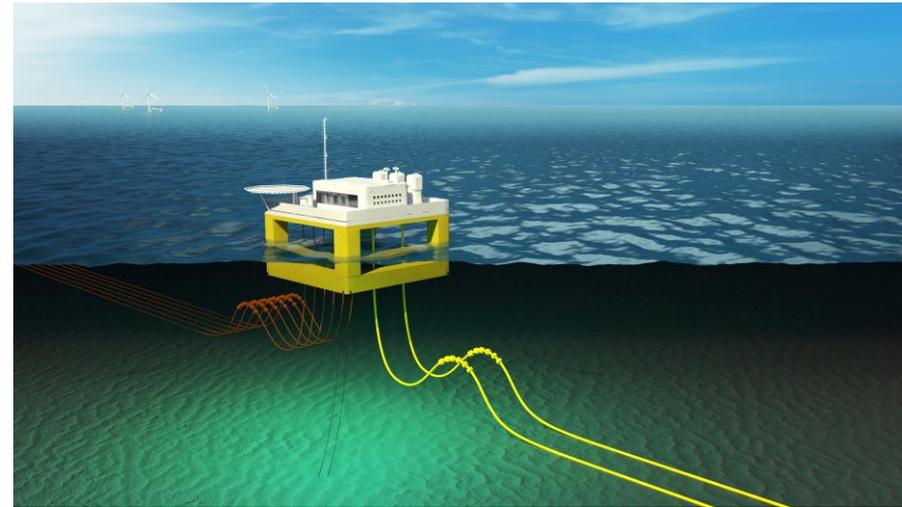
Qualification of 145 kV dry design

- Development of new water barrier
 - ✓ *Longitudinally welded sheath*
 - ✓ *Emphasise of mechanical (fatigue) integrity of weld*
- (2021) Qualified dynamic 145 kV for 1,500 m water depth
- Qualification:
 - Full-scale tensile- bending
 - Flex test
 - Electrical type test
 - Various other tests on power phases and cables



Wrap-Up

- Technology is qualified up to 145kV (~100MW) with confidence to apply it further: 245kV (~350MW), HVDC applications...
- Current standards are limited, and the top-down methodology used for static cable qualification is not directly transposable.
- Predictability of the design analysis requires a thorough understanding of failure modes at various scales.
- Important to discuss new projects opportunity at the earliest to anticipate through concept/Pre-FEED study :
 - definition of "qualified technology"
 - congested manufacturing slots



Thank you

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