

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~

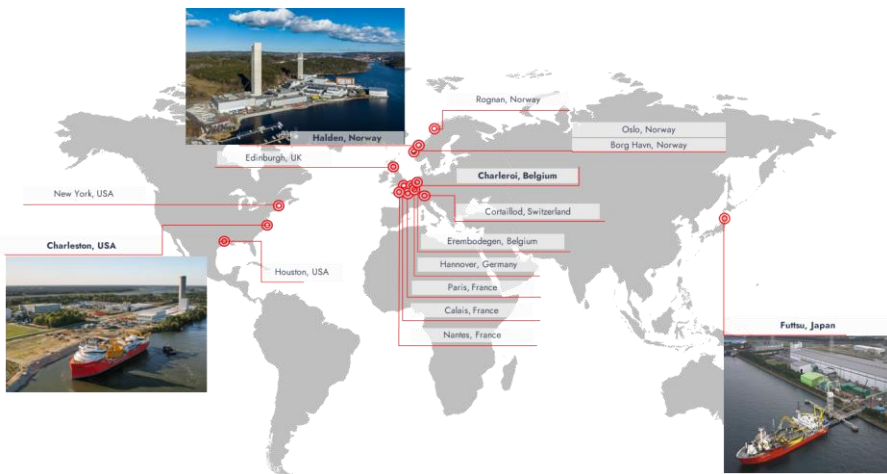
Invested since 2018 to increase capacity in Manufacturing & Installation with a focus on HVDC expansion

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)

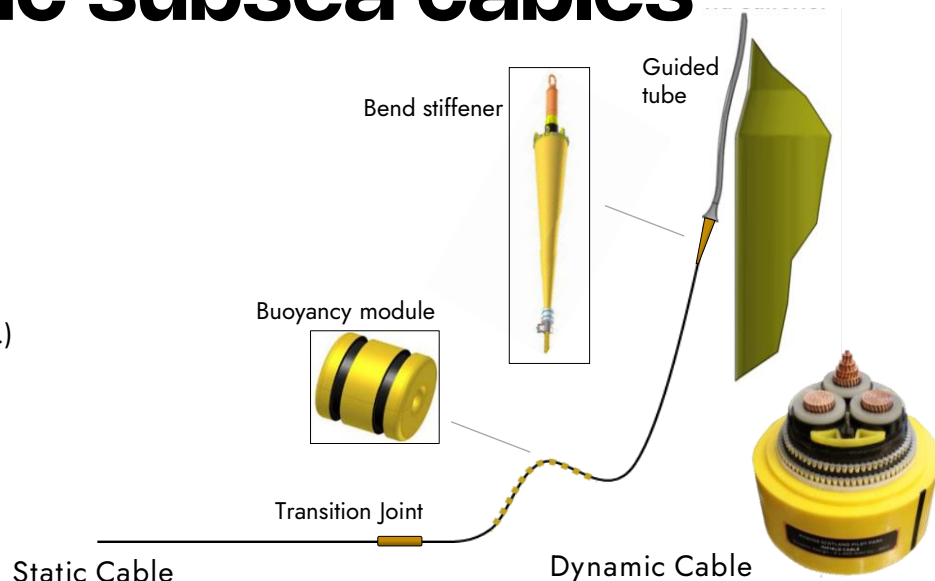
Dynamic cables for floating offshore wind

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

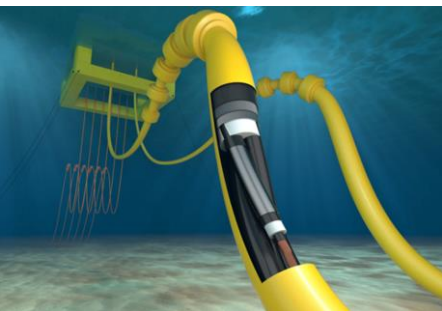
OFFSHORE WIND EXPORT CABLES

Qualified static cables

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

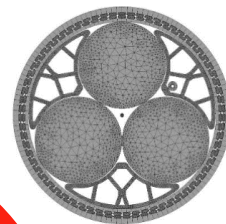
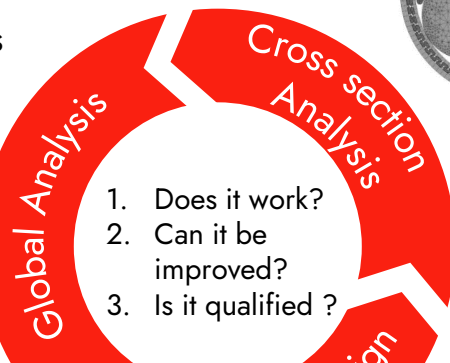


Dynamic cable benchmark is an iterative process



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

Project Data



Customer Requirements

Design basis

Cable System Design

Technology Risk Assessment

Technology Qualification Plan

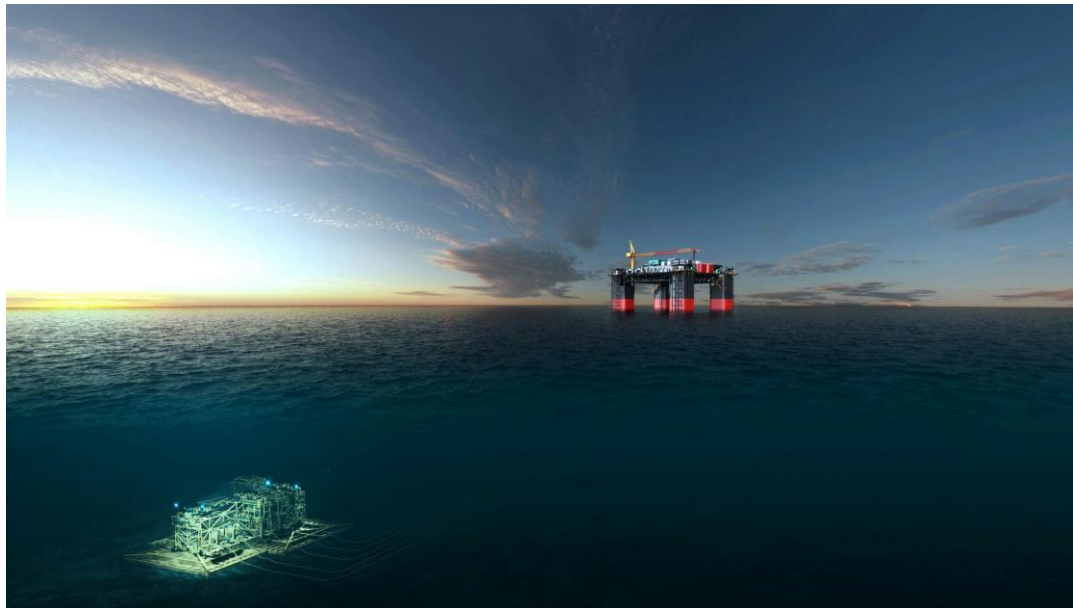
3 Ades. No SS in this model. Minimum current	Also consider buried dynamic cable.	Most significant contributor to charging current. Minimize if possible	High ambient temp. and deeper burial near shore.	HCO water-filled.	HCO air-filled if protected at.	No optimization in this study phase.



Jansz- IO overview

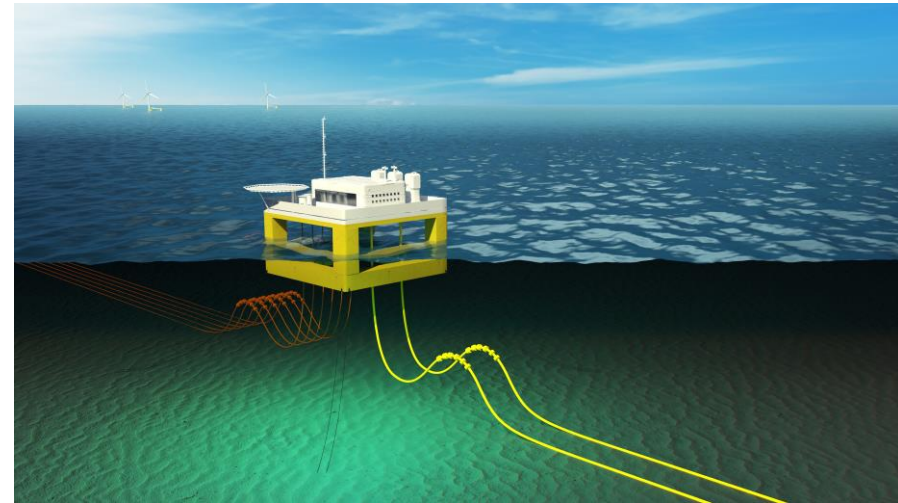
Qualification of 145 kV dry design

- 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

The background of the slide is an underwater scene. A large yellow cable, possibly a power or data cable, curves from the top right towards the center. It has a black section with a white band. In the upper left, a yellow mechanical arm or structure is visible. Several thin, brownish cables hang from a platform in the background. The water is blue and slightly murky, with some light rays visible.

AYMERIC ANDRE

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