Supergen Offshore Renewable Energy

Workstream 4 update

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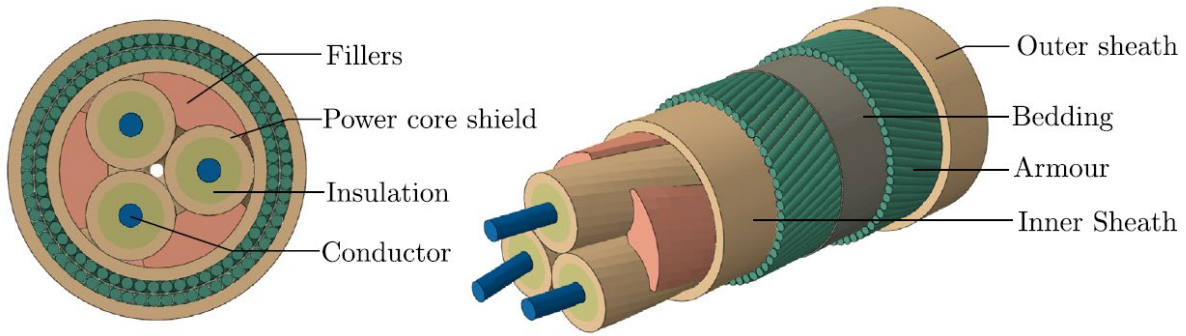
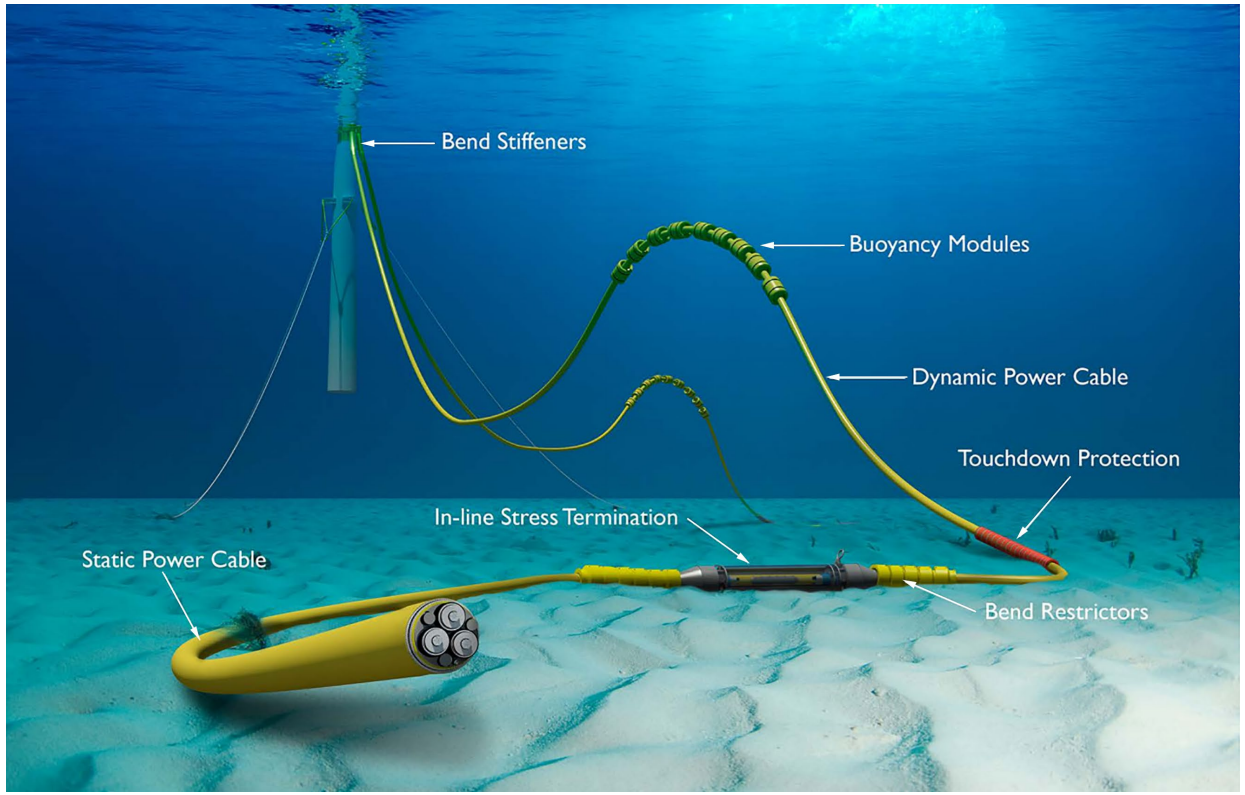
Dynamic power cables

- Key component for floating offshore renewables
- Complex heterogeneous structures
- Aim of WS4:
  - Improved characterisation of mechanical properties
  - Reduced-order modelling of global responses
- Development of reference cable design (SRS2)



Ménard & Cartraud 2023



Physical tests at DMaC

- Current models typically only consider bending stiffness
- Actual mechanical properties more complex
  - Nonlinear bending stiffness
  - Hysteresis properties
  - Dependence on tension
- Characterisation based on physical test data of full-scale cable samples

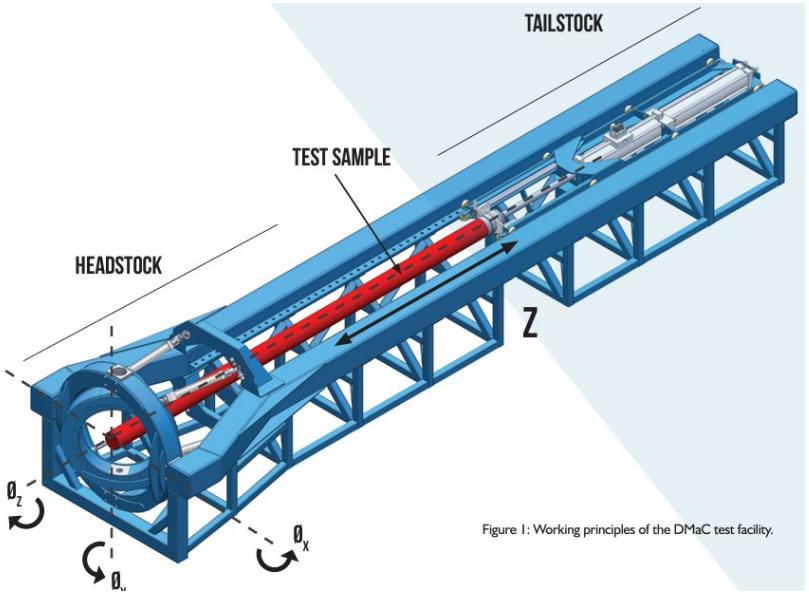
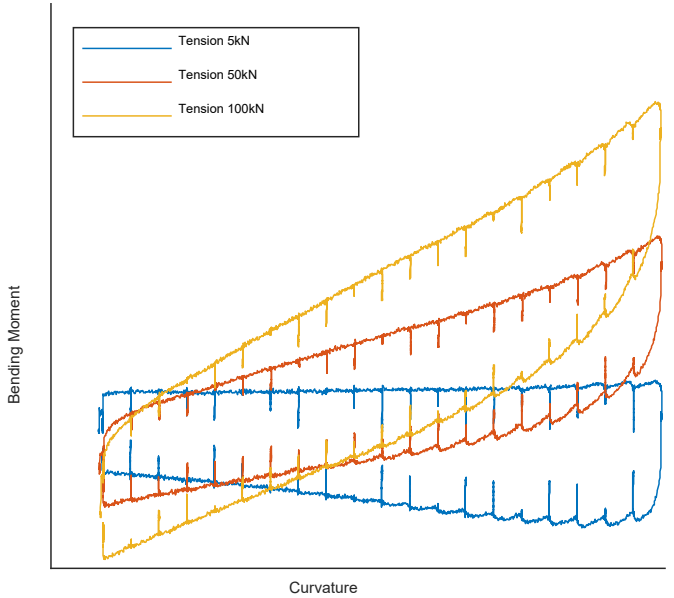


Figure 1: Working principles of the DMaC test facility.



Global modelling

- Validation of simplified mechanical model
  - MATLAB Simulink model
  - Replicate experimental setup at DMAC
- Development of reduced order modelling methods
  - For use in floating ORE global response models (Orcaflex)
  - Comparison between simple (constant stiffness) and advanced modelling strategies