POLYAMOOR
Durable and flexible polyamide moorings for offshore renewable energies

DURATION: 46 months (2017-2020) | **BUDGET : €824K**

TECHNOLOGIES

STAGES OF THE VALUE CHAIN

Design

O&M

CONTEXT

The amooring systems used for floating wind turbines differ significantly from those used in the oil and gas industry due to the high dynamics in shallow water. The challenge is to be able to maintain the float in an extreme environment by limiting the dynamics transmitted by the lines and the maximum offset of the float to which the production export cable is connected. **One of the solutions envisaged consists of using nylon lines capable of absorbing the dynamics but whose behaviour is highly non-linear and not well known in the long term.**

OBJECTIVE

To characterise in detail the dynamic and long-term behaviour of nylon mooring lines in order to develop standards accordingly
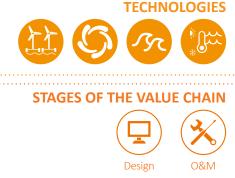
MAIN ACHIEVEMENTS

- Identification of a nylon cable configuration compatible with the lifetime of a floating wind farm (20-25 years)
- Identification of a generic visco-elasto-plastic rheological scheme
- Analytical formulations of the different rheological blocks adapted to nylon, then calibration and validation of these formulations by specific test sequences
- Identification of a simple long-term creep law (period > 1 year)
- Feasibility of an accelerated self-heating life prediction method

OUTPUT RESOURCES

- **Database** of small-scale stress and elongation for nylon behaviour characterisation
- **Database** of stress and elongation for sub-cord fatigue tests
- **Analytical model** of the visco-elasto-plastic behaviour of nylon and **proprietary module** of this behaviour law in the commercial software DeepLines™
- **Analytical formulation and test protocol** for accelerated qualification of nylon by self-heating
- **Analytical formulation** of long-term nylon creep
- **Update of the guidance note** for the certification of synthetic lines used in offshore environments (BV NI432)

CONCLUSION

POLYAMOOR has identified a behavioural law that closely reproduces the instantaneous behaviour of nylon. A long-term creep behaviour law has been identified. Creep at different loading rates and its effect on the behaviour law will be studied in the MONAMOOR project. The service life objectives are achieved with a dedicated rope construction and the use of a specific polymer coating. The performance durability of this coating remains to be qualified. The results have led to the updating of a recommendation note for the certification of synthetic lines used in the offshore environment (BV NI432).

PARTENAIRES

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