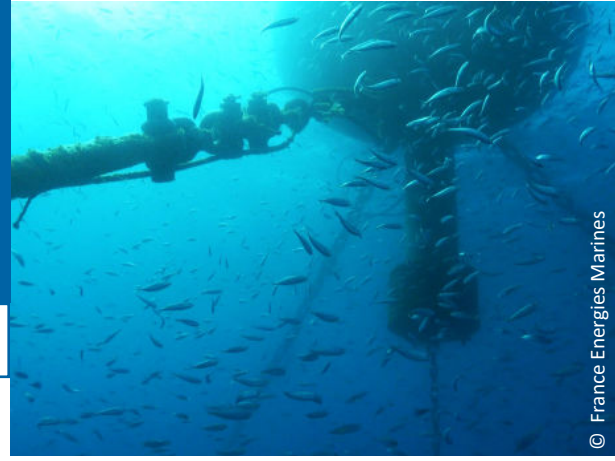


BAMOS

Behaviour and ageing of mooring using synthetic rope



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DURATION: 42 months | **LAUNCH:** 2023 | **BUDGET:** €2,255K

CONTEXT

Synthetic ropes offer a promising mooring solution for floating systems, in particular wind turbines, with lower loads and reduced seabed footprint. However, they show complex tension-elongation behaviours which differs for instantaneous and long-term loadings, in function of the material used. Among these synthetic fibres, polyamide is of interest to lower the peak tension in the mooring lines, especially in shallow waters. **During previous projects, the understanding and modelling of the complex mechanical behaviour of polyamide ropes was significantly improved. However, some questions still need to be solved for a long-term use with high level of reliability.**



TECHNOLOGIES

STAGES OF THE VALUE CHAIN



Design

Installation
Construction

O&M

OBJECTIVES

To improve the modelling of short- and long-term behaviour of nylon ropes and expand the knowledge on fatigue and degradation mechanisms

SCIENTIFIC CONTENT

In-depth modelling of polyamide ropes

- Development of a meso-scale model
- Enhancement of 1D behaviour law for rope
- Experimental campaigns

Investigations on fatigue mechanisms

- Extension of the fatigue curve at low tension range
- Fatigue prediction method using self-heating approach
- Investigation on the influencing parameters of the fatigue curve
- Challenge a new criterion for fatigue prediction

Validation of polyamide rope behaviour law and degradation

- Laboratory validation of behaviour law on a full-scale rope
- Impact of selected rope model on mooring design
- Extended sea trials, review of degradation rope mechanisms, ropes inspection and tests after dismantling

EXPECTED RESULTS

- Validated meso-scale model for different construction patterns
- Fatigue prediction method using self-heating approach, including a new challenged fatigue criterion
- Fatigue curve extended towards high number of cycles, and assessment of parameters influencing fatigue
- Validated polyamide behaviour law after 1 year of mooring service, numerical study on optimisations made possible by this law
- State of the art and feedback on degradation mechanisms

PARTNERS



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