On-site test of components and sensors exposed to marine degradations processes: fatigue, corrosion and biofouling

Ameryoun Hamed, Schoefs Franck*
Capacités SA, Nantes, France, hamed.ameryoun@capacies.fr;
**Université de Nantes, GeM, UMR CNRS 6183, Sea and Litoral research Institute - FR CNRS 3473, Nantes, France, franck.schoefs@univ-nantes.fr*

Abstract
Development of Marine Renewable Energy devices necessitates the offshore installation where structures are exposed to complex and harsh environmental conditions (environmental forces, biocolonization, corrosion, fatigue, etc.). Aforementioned conditions causes degradation mechanisms that can disturb the performance of MRE devices especially in the case of floating structures. As Marine Renewable Energy devices and Oil and Gas platforms push into deeper waters further from shore, there is a growing need to minimise costs and failure risks over the whole life-time of these structures. A key part of reducing costs and de-risking involves carrying out comprehensive on-site assessments that inform engineers and designers about the safety state, biological fouling potential and environmental conditions specific to the installation site. Therefore, it is essential for offshore MRE actors to know and to understand well these mechanisms and phenomena in order to optimize the maintenance costs of MRE offshore fields and to produce a competitive energy in terms of final price. University of Nantes disposes a measurement station “BIOCOLMAR”, patented in 2013, in a demonstration site named UN-SEA-SMS. The test site is located in “Basse Michaud” 7 kilometres offshore of French Atlantic coasts (see Fig. 1). BIOCOLMAR offers to MRE industries and Offshore Wind actors a better understanding of the installation site in terms of environmental conditions and degradation phenomena such as Biofouling, corrosion and fatigue. Biocolmar consists of modular equipment’s as well as multi-parameter sensors for material tests and data acquisition which are necessary for the optimization of maintenance programs. The paper presents the potential of this station and the first results: marine growth, and behaviour of Fiber Optical Sensors (Fig. 2).

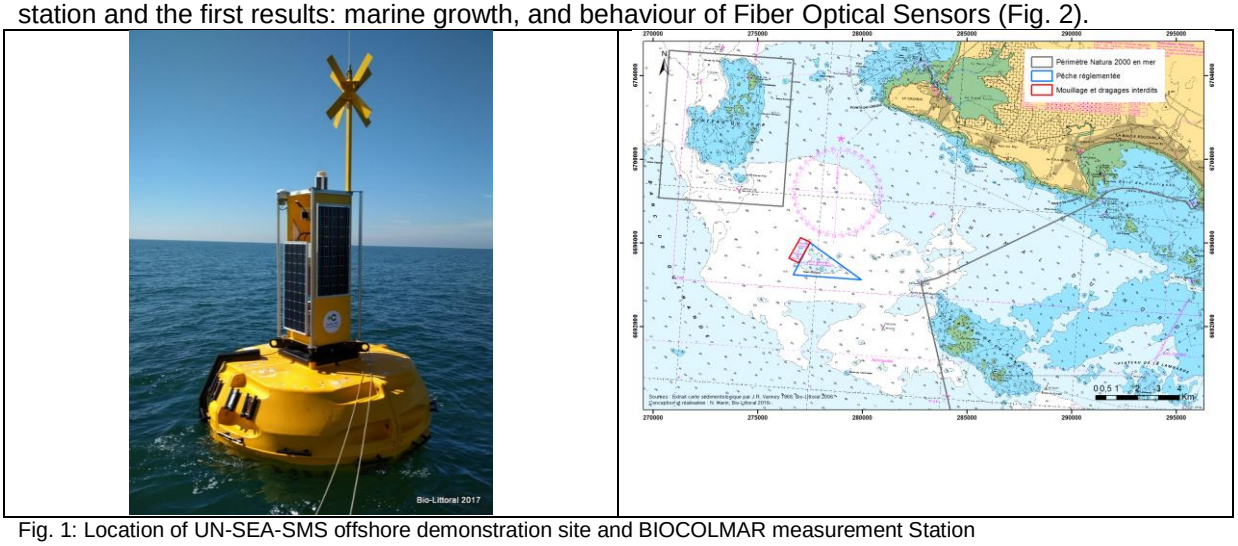

Fig. 1: Location of UN-SEA-SMS offshore demonstration site and BIOCOLMAR measurement Station

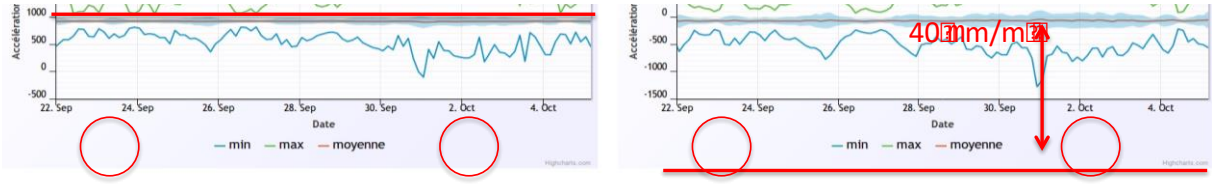

Fig. 2: Strain from FOS gauges on the anchoring system