***CATHODIC PROTECTION OF MARINE STRUCTURES: MODELLING AND APPLICATION TO RENEWABLE MARINE ENERGIES***

Anne-Marie GROLLEAU - Senior Marine and CP Expert.

*DCNS Research – BP 440 50104 Cherbourg Octeville.*

Corrosion control of immersed marine structures is ensured by the used of cathodic protection (CP) systems, whether galvanic or impressed cathodic current systems (ICCP). CP is often used in conjunction with paint systems to reduce the size of the CP system.

For simple structures the design of CP system is often based on analytical or even empirical calculations. However, for complex structures numerical modeling can provide significant benefit. The objective of a CP design is to produce an evenly distributed potential on the structure, insure the protection throughout the expected life and gain confidence in the anode life duration estimation. Numerical modelling allows the optimization of the CP design by identifying insufficiently protected regions - possibly subject to corrosion, and overprotected regions – possibly subject to coating disbonding or hydrogen embrittlement in the case of ICCP systems. The anode life durations can also be evaluated, then allowing the definition of maintenance plans. Nevertheless, the relevance of such data depends on the acquisition of input data that are reliable and close to operational environments.

This presentation will review the basics requirements of CP in sea water and modelling. It will describe the application of a modelling software, based on the boundary element techniques, to predict the performance of galvanic systems applied to renewable marine energies.