

Training course on: “**Integrated Tank Testing for the Offshore Renewable Industry**”

**UCC MaREI, IFREMER and TECNALIA**

November 25<sup>th</sup> – 29<sup>th</sup> 2019

**Course Outline**

**25/11/2019**

14:00 hs – 18:00 hs

- Registration & Welcome.
- Course outline. Introduction to TECNALIA, UCC and IFREMER.
- Visit to the UCC labs.
- Tank/Electrical Testing, Health and Safety.
- Fluid Mechanics. Short history of Hydrodynamics. Froude and Reynolds scaling.
- Overview of experimental tools (waves, wind, current).

**26/11/2019**

09:00 hs – 18:00 hs

- Fluid mechanics. Perfect fluid with free surface.
- Waves: analytical modelling (Airy, Stokes, higher order).
- Waves and sea states: regular and irregular waves; open sea; tank configuration (generation, reflection, absorption).
- Data analysis: Fourier and spectral analysis, statistical analysis.
- Examples with some experimental data from IFREMER tank.
- Fluid mechanics. Seakeeping. General dynamics equation (added inertias, damping, stiffnesses, waves loads).

Lunch

- Practical model scaling. Assessing inertias, stiffnesses with focus on mooring.
- Added inertias and damping effects (Froude and Reynolds scaling).
- Instrumentation. Calibration. Data acquisition.
- Some examples of model scaling.
- Data analysis: examples with some experimental data from IFREMER and others.
- Discussion and preparation about the tank testing on Thursday.

## **27/11/2019**

09:00 hs – 18:00 hs

- Power Conversion Alternatives.
- Control Systems.
- Main control loops.
- Case Study : OWC modelling and control for low inertia.
- PC Lab Session.

Lunch

- PC Lab Session.
- Main power quality issues in ocean energy applications.

## **28/11/2019**

09:00 hs – 18:00 hs

- Tank testing. Electrical testing.

Lunch

- Tank testing. Electrical testing.

## **29/11/2019**

09:00 hs – 13:30 hs

- Data analysis, conclusions, discussion on results.
- End of the short-course.

### **Organised by:**

- Centre for Marine and Renewable Energy, University College Cork (UCC MaREI)
- French Research Institute for Exploitation of the Sea (IFREMER)
- Tecnalia Research & Innovation (TECNALIA)

### **Venue:**

**Testing at** MaREI Centre for Marine and Renewable Energy, Beaufort Building, Environmental Research Institute, University College Cork, Ringaskiddy, Cork, P43 C573, Ireland.

**Data analysis** at the Campus of University College Cork, College Road, Cork, T12 K8AF, Ireland.

***Please be aware that minor internal changes could occur prior to the begin of the course.***