


CORE 2016

2nd International Conference on Offshore Renewable Energy

12 — 14 September 2016

Glasgow City Hotel
Cambridge St, Glasgow
G2 3HN
UK

- Drinks Reception and Conference Dinner
- Workshop on Offshore Floating Wind Turbines—Support Structures
- Keep up to date with Offshore Renewable Energy Resources & Systems

- Drinks Reception and Conference Dinner
- Workshop on Offshore Floating Wind Turbines—Support Structures
- Keep up to date with Offshore Renewable Energy Resources & Systems

Conference Programme Day One: 12th September

08:25 — 08:55 **Delegate Registration**

08:55 — 09:00 **Welcome Address**

09:00 — 09:40 **Keynote Paper: Offshore Wind: The Cost Reduction Journey,** *Dr Ignacio Marti, ORE Catapult, UK*

09:40 — 10:20 **Keynote Paper**: ***Wave and Tidal Energy R&D - Achievements and Direction***, Professor Robin Wallace, The University of Edinburgh, UK

10:20 — 10:40 **Invited Paper: Tribology issues in Tidal Turbine Technologies**, Professor Margaret Stack, University of Strathclyde, UK

10:40 — 11:10 Break

11:10 — 11:30 **Invited Paper**: ***Tides and tidal power from a historical perspective***, *Alistair Borthwick, The University of Edinburgh, UK*

11:30 — 11:50 ***The Multi Rotor Solution for Large Scale Offshore Wind Power***, Peter Jamieson, University of Strathclyde, UK

11:50 — 12:10 ***Reliability based format for the design of wind turbine jacket pile foundations,*** P.K. Das; M.R. Notley, E Padayattil; I. Cortizo; T. Hodgson; G. McCann; T. Camp, ASRANet Ltd, UK; Atkins Global, UK & DNV GL, UK

12:10 — 12:30 ***50 MW test scheme for new offshore wind technologies***, *Benoît Bizet, Danish Ministry of Energy, Utilities and Climate, Denmark*

12:30 — 14:00 Lunch

10:20 — 12:30 Parallel Session

10:20 — 10:40 ***Study on utilisation of the amplified wave height inside a perforated chamber by a heaving plate model,*** P Krishnendu; R.Balaji, Indian Institute of Technology Bombay, India

10:40 — 11:10 ***Break***

11:10 — 11:30 ***An environmental assessment of wave energy converter arrays and their effect on the surrounding wave field,*** Bjoern Elsaesser, Queen's University Belfast, UK

11:30 — 11:50 **Investigation of Vertical-axis Tidal Turbine in Augmentation Channel,** Bing Chen, Huan Zhang, Shuaibing Cheng, *Dalian University of Technology.Panjin, China*

11:50 — 12:10 **Fatigue life assessment of existing offshore wind turbines,** W. Weijtens, Universiteit Brussel, Belgium

12:10 — 12:30 **Project schedule assessment with a focus on different input weather data sources**, Dirk Bendlin, Gerrit Wolken-Möhlmann and Marcel Wiggert, Fraunhofer IWES, Bremerhaven, Germany

12:30—14:00 **Lunch**

Conference Programme Day One: 12th September

14:00 — 14:20 ***Wind and wave directional transit time model for offshore wind operation and maintenance,*** *Peter Mills; I. Lazakis; B. Stephen; D. McMillan, University of Strathclyde, UK*

14:20 — 14:40 ***Wind Yield Assessment for Airborne Wind Energy****, Stephanie Mann; K. Gunn; G. Harrison; B. Beare; I. Lazakis,, The University of Edinburgh, UK; E.ON Technologies, UK; University of Exeter, UK & University of Strathclyde, UK*

14:40 — 15:00 ***Suction Pile Technology for Dudgeon Offshore Wind Farm Substation***, Stefan Buykx; Marijn Dekker, SPT Offshore, Netherlands

15:00 — 15:30 **Break**

15:30 — 15:50 ***Increased ROI from Offshore Wind turbines through Minimisation of Blade Angle Deviation and Rotor Imbalance***, Christoph Heilmann; Anke Grunwald; Michael Melsheimer, BerlinWind, Germany

15:50 — 16:10 ***Combined loads of wind and waves on offshore floating wind turbines****, Jessica Guichard Plymouth University, UK*

16:10 — 16:30 ***Resurrection of the VAWTs****, Eugene Mak, Independent Consultant*

16:30 — 16:50 ***A novel experimental setup to study long term performance of offshore wind turbines****, Subhamoy Bhattacharya; G.Nikitas; N.J.Vimalan, University of Surrey, UK & VJ Tech, UK*

16:50—17:10 **Mesoscale Models as Alternatives to Meteorological Masts,** Peter Argyle; Simon Watson, Loughborough University, UK

14:00—17:30 **Workshop — See Page 8 for more details**
Workshop on Offshore Floating Wind Turbine: Support Structures, Dr Maurizio Collu, Cranfield University, UK

15:00– 15:30 **Break**

19:00 **Civic Reception**
Glasgow City Chambers*, George Square, G2 1DU*

Conference Programme Day Two: 13th September

09:00 — 09:40	**Keynote Paper: The importance of understanding the flow impedance of tidal stream channels and how this might change turbine design and increase estimates of the tidal steam resource** ***Professor Stephen Salter****, The University of Edinburgh, UK*
09:40 — 10:00	**The Subhub Tidal Foundation Platform, *J. Smith,*** *QED Naval, UK*
10:00 — 10:20	***Assessment of tidal energy potential along the Gulf of Khambhat***, Gujarat, India, Satheesh Kumar; Balaji Ramakrishan; Vengatesan , Indian Institute of Technology Bombay, India; The University of Edinburgh
10:20 — 10:40	***Experimental testing of tidal turbines in realistic & idealised conditions***, Bjoern Elsaesser; Carwyn Frost; Penny Jeffcoate, Queen's University Belfast, UK & Sustainable Marine Energy Ltd, UK
10:40 — 11:10	**Break**
11:10 — 11:30	***Fuzzy Modelling and Identification for Sustainable Control Design of an Offshore Wind Farm***, Silvio Simani; S. Farsoni; P. Castaldi, University of Ferrara, Italy; University of Bologna, Italy
11:30 — 11:50	***Comparative study of combined concepts STC and SFC with respect to functionality and survivability based on numerical analysis***, Constantine Michailides; Nianxin Ren; Zhen Gao; Torgeir Moan, Liverpool John Moores University, UK; NTNU, Norway & Dalian University of Technology, China
11:50 — 12:10	***Fatigue performance of GFRP composite tidal turbine***, Anas Rahman; Vengatesan Venugopal; Jérôme Thiebot, The University of Edinburgh, UK & Normandie
12:10—12:30	***Development and commercialisation of a floating wind and wave hybrid,*** Chris McConville, Floating Power Plant, Denmark
12:30 — 14:00	**Lunch**
14:00 — 14:20	***Tidal Current Phasing along the Coast of Norway***, Nicole Carpman; Karin Thomas, Uppsala University, Sweden
14:20 — 14:40	***The effect of wave-current interactions with Tidal Stream Turbines on 3D flow measured with Particle Image Velocimetry in a laboratory flume***, Laura Jordan; Stuart McLelland; Brendan Murphy; Daniel Parsons, University of Hull, UK
14:40 — 15:00	***Tri — bological approaches to developing smart materials for tidal turbines using erosion maps***, Rafee Abdulmajeed Rafee Ahamed, University of Strathclyde, UK
15:00 — 15:30	**Break**
15:30 — 15:50	***Coupled RANS-VOF modelling of floating tidal stream***, Ed Ransley; S. A. Brown; D. M. Greaves; S. Hindley; P. Weston; E. Guerrini, Plymouth University, UK; Mojo Maritime Ltd, UK; A&P Group Ltd, UK & Modular Tide Generators Ltd, UK
15:50 — 16:10	***A Probe into Tidal Energy Extraction through Buffeting***, Mohammadmehdi Armandei; Antonio Carlos Fernandes, Federal University of Rio de Janeiro, Brazil
16:10 — 16:30	***Actuator-Line CFD Modelling of Tidal Stream Turbines***, David Apsley; P.K. Stansby; T. Stallard, The University of Manchester, UK
16:30 — 16:50	***A Lookup Table Approach to Determining Wind Turbine Operational Fatigue Loading from Wind Field Measurements***, Edward Hart; Mark Keegan; David McMillan , University of Strathclyde, UK
19:00	**Conference Dinner** ***Glasgow City Hotel,*** *Cambridge St, Glasgow , G2 3HN , UK*

Conference Programme Day Three: 14th September

09:00— 09:40 **Keynote Paper: Challenges in the design of foundations for offshore Wind Turbines.** S. Bhattacharya, University of Surrey, UK

09:40 — 10:00 **Invited Paper : The Hydrodynamics of floating air-filled bags for wave energy conversion ,** Deborah Greaves, Plymouth University, UK

10:00 — 10:20 ***Development and commercialisation of a floating wind and wave hybrid,*** Chris McConville, Floating Power Plant, Denmark

10:20 — 10:40 ***De-risking marine energy project development through improved uncertainty analysis*** *, Sunny Shah; H. Buckland; P. Thies; T.Bruce; E Boulougouris, The University of Edinburgh, UK; Black & Veatch Ltd, UK; University of Exeter, UK & University of Strathclyde, UK*

10:40 — 11:10 ***Break***

11:10 — 11:30 ***An innovative PTO for a point pivoted absorber for wave energy conversion,*** Arne Vogler; D. Coiro; G. Troise; F. De Luca; L. Castellini; G. Alessandri; C. Greenwood, University of the Highland and Islands, UK; University of Naples, Italy; Seapower Scrl, Italy & UMBRA Cuscinetti S.p.A., Italy

11:30 — 11:50 ***A Simulation Tool to Enable design for Reliability for Tidal Turbine***, Claudio Bittencourt, Benson Waldron, Alexandros Zymaris, Nikolaos Kakalis

11:50—12:10 ***Adaptive Fault Detection and Tracking for a Wind Turbine Generator using Kalman Filter Raed***, *Kh. Ibrahim; Abdullahi Daniyan; Simon. J. Watson, Loughborough University, UK*

12:10—12:30 **The Inherent Advantages of Linear Sail Based Technology in Slow Moving Current,** Are Børgesen, Tidal Sails AS, Norway

12:30 — 14:00 **Lunch**

09:40 — 12:30 ***Parallel Session***

09:40 — 10:00 **Comparative study of combined concepts STC and SFC with respect to functionality and survivability based on numerical analysis,** C. Michailides; N. Ren; Z. Gao; T. Moan, Liverpool John Moores University, UK; NTNU, Norway & Dalian University of Technology, China

10:00 — 10:20 ***Assessing the full scale performance of tension pile foundations under monotonic and cyclic shearing using direct shear tests***, S. Donohue; P. Bergamo, Queen's University Belfast, UK

10:20—10:40 ***Life Extension for Wind Turbine Structures and Foundations,*** Tim Rubert; P Niewczas; D. McMillan, University of Strathclyde, UK

10:40 — 11:10 ***Break***

11:10 — 11:30 **Performance evaluation of an innovative device to transform wave power into electric energy in ports and harbours,** ***A. Danelli , M. Peviani,*** *RES SpA*

11:30 — 11:50 **Applicability of Vertical Microstructure Profiler measurements in high current streams,** ***M. Shahsavarifard, A. H. Birjandi, E. L. Bibeau, S. Guillou, E. Poizot, Y. Méar ,*** *University of Manitoba, Canada; University of Caen Lower Normandy, France*

11: 50 — 12:10 **Development of an economical and insured TLP substructure for a 6MW wind turbine – use of steel concrete composite material,** ***Frank Adam,*** *GICON Consult GmbH, Germany*

12:10 — 12:30 **Hydrodynamic Response of Three and Four Column Floater For Vertical Axis Wind Turbine**— K. Rajeswari; S. Nallayarasu, IIT Madras, Chennai, India

12:30—14:00 **Lunch**

Conference Programme Day Three: 14th September

14:00 — 14:20 ***Validation of linear model for wave-current interaction at tidal energy site****, George Crossley; Ed Mackay; Sandy Day; Helen Smith; David Ingram, DNV GL, UK; University of Strathclyde; University of Exeter & The University of Edinburgh*

14:20 — 14:40 ***Choices of Turbulent Closure Model for Hydrodynamics Simulation in the Pentland Firth***, Anas Rahman; Vengatesan Venugopal, The University of Edinburgh, UK

14:40 — 15:00 ***Empirical Analysis of the Wave Climate at the Danish Wave Energy Centre****, Amélie Têtu; Jens Peter Kofoed, Aalborg University, Denmark*

15:00 — 15:30 **Break**

15:30 — 15:50 ***Mechanical Wave energy converter with oscillating arm: Experimental investigations***, Srinivasan Chandrasekaran; B. Raghavi, Indian Institute of Technology Madras, India

15:50 — 16:10 ***Steel / concrete connections for floating wave energy converters****, Leah Ewart; D Findlay; N Barltrop; P.R.Thies; T.Stratford, The University of Edinburgh, UK; Albatern, UK; University of Strathclyde; University of Exeter, UK*

16:10 — 16:30 **Prototype Development of the Vibro-Impact Capsule Robot for Pipeline Inspection** A. Crawford, J. Williamson, J. Thomson, G. Kerins, S. **Islam, Y. Liu,** Robert Gordon University, UK

16:30 — 16:50 **Available Technologies and Performance Prediction Models for Multiphase Boosters** G. Nunez, J. de Andrade, M. Stanko, S. Sangesland, NTNU, Norway

14:00 — 16:50 **Parallel Session**

14:00 — 14:20 ***Selection of the most appropriate Life Extension Strategy for Offshore Wind Turbines using Multiple Criteria Decision-Making Technique,*** Mahmood Shafiee; Isaac Animah, Cranfield University, UK

14:20 — 14:40 ***Increasing Operational Certainty, while Decreasing Weather Sensitivity During the Installation of Offshore Wind*** *Array Cables, Alex Gauntt, Siem Offshore, UK*

14:40— 15:00 **AN INNOVATIVE ELECTROMECHANICAL OCEAN ENERGY CONVERTER,** E. Renzi, M. Discacciati, Loughborough University, UK

15:00 — 15:30 **Break**

15:30 — 15:50 **SCADA-BASED THRUST FORCE ESTIMATION OF AN OFFSHORE WIND TURBINE,** N. Noppe, A. Iliopoulos, W. Weijtjens, C.Devriendt, Offshore Wind Infrastructure lab (OWI-lab), Belgium

15:50 — 16:10 **HYDRODYNAMIC RESPONSE OF THREE AND FOUR COLUMN FLOATER FOR VERTICAL AXIS WIND TURBINE**, K. Rajeswari; S. Nallayarasu, IIT Madras, India

16:10—16:30 **Non-floating Non-submersible sea wave energy converter,** G. Bharathi, Central Leather Research Institute, Chennai

16:30—16:50 ***Reduction device for induced drag and vortex,*** Christian Hugues, Minix, France

16:50 **Conference Close**

About Keynote Speakers

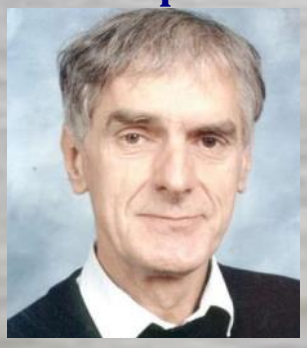
Dr Ignacio Marti

Ignacio joined the ORE Catapult Management team as part of the merger with Narec, where he was Chief Technology Officer. Prior to joining Narec in November 2012, Ignacio had spent 20 years working in the renewables industry in Spain, latterly at CENER where he worked up to the executive position of Technical Director for Research & Development (R&D). After completing an MSc in Physics at the University Complutense of Madrid in 1994, he began work as a researcher in the Wind Energy Department of Ciemat, a Spanish Research Centre, specialising in energy and the environment. Ignacio then worked on private and EU funded R&D programmes before moving on to head-up the Wind Resources Assessment and Forecasting Research Group at Ciemat. Between 2002 and 2009, as Head of Wind Resources and Forecasting Service at CENER. In October 2013, he was elected Vice Chair of the "Implementing Agreement on Wind Energy" Executive Committee of the International Energy Agency

Prof Robin Wallace

Prof. Robin Wallace graduated B.Sc. in 1976 and Ph.D. in 1990 at the University of Edinburgh. Between these times he worked for Parsons Peebles Motors and Generators project-engineering turnkey power generation systems around the world, mainly in small-hydro. He holds a personal chair in Renewable Energy Systems and founded The Institute for Energy Systems in the School of Engineering at the University of Edinburgh where he is now Dean International in the College of Science and Engineering. His research interests include marine energy development and smart-grids, specifically the interaction of distributed renewable energy generation with the autonomous electricity networks. He has has supervised 18 PhD students to completion, while publishing over 100 papers. He is Executive Director of the EPSRC SuperGen UK Centre for Marine Energy Research, a Director of the FloWave Ocean Energy Research Facility and a founding Co-Director of the Scottish Energy Technology Partnership. He has established research collaborations between the Institute and partner universities in many countries including USA, Canada, India, Taiwan, China and Chile. He is a Fellow of the Royal Society of Edinburgh and The Institution of Engineering and Technology and is a Chartered Electrical Engineer.

Prof Stephen Salter



Stephen Salter is Emeritus Professor of Engineering Design at Edinburgh University. After an apprenticeship in the aircraft industry as fitter and toolmaker on hovercraft and the Black Knight rocket he did a degree at Cambridge. He has worked on noise recording from birds eggs, astronomical instruments, robots, energy from wind, waves and tidal streams, desalination, voter-friendly traffic congestion, computer-controlled hydraulics, flood prevention, mine clearance, suppressing explosions, increasing the capacity of road bridges and now on the design of seagoing hardware to reverse global warming by making clouds whiter. Reports of his retirement are exaggerated. He likes very short introductions.

Prof Subhamoy Bhattacharya

Professor Subhamoy Bhattacharya(Suby) holds the chair in Geomechanics at the University of Surrey since October 2012 and is also a visiting fellow at theUniversity of Bristol. He previously held the position of Senior Lecturer in Dynamics at University of Bristol, Departmental Lecturer in EngineeringScience at the University of Oxford, Junior Research Fellow of Somerville College (University of Oxford),
College Lecturer at Brasenose College and Lady Margaret Hall (University of Oxford). Professor Bhattacharya earned his doctorate from the University of Cambridge investigating failure mechanisms of piles in seismically liquefiable soils.
Professor Bhattacharya had many happy years working in the Civil/Offshore Engineering consultancy: Staff engineer and project manager at Fugro Geo Consulting Limited (2003 to 2005), Consulting Engineering Services (I) Limited (now Jacobs).

Workshop on Offshore Floating Wind Turbine: Support Structures

Course Overview

The need to further harness offshore wind resources to increase renewable energy generation is pushing offshore wind turbine projects into waters deeper than 50 m, where floating support foundations are more economically viable than fixed support foundations. After a number of prototypes deployed offshore, the first offshore floating wind farms have been approved and are being developed (such as Oregon WindFloat Pacific's floating wind farm and Hywind Scotland Pilot Park4).

The novelty of the fields is raising a lot of questions: why floating? Which floating support structure is the most suitable? How to perform their conceptual design taking into account the complex set of requirements? In this workshop, we will explain first of all why floating wind turbines can be advantageous, and which one are the main challenges.

We will then see how floating wind turbine systems are classified, covering the fundamentals, and we will propose a methodology to choose the most suitable floating support structure for a given wind turbine and location, exploring the design driving criteria.

To finish, we will see a preliminary design methodology for floating wind turbines.

You Will Learn To:

- Explain what are the main advantages and challenges for offshore floating wind turbines and why the industry is moving toward floating wind turbines
- Understand the methodology used to classify offshore floating wind turbine systems, and recognize the main advantages and disadvantages of each type
- Develop and use a flexible multi-criteria decision methodology to determine the most suitable floating support structure, for a given wind turbine and location
- Fundamental steps for the conceptual design of an offshore floating wind turbine

Course Outline

- Introduction
- Why floating?
- Main floating support structure types, and classification
- A multi-criteria decision methodology to choose the most suitable floating support structure
- Understand the basic steps of the conceptual design of a floating support structure for an offshore floating wind turbine

Material Provided

The attendants will be provided with a copy of the presentation, and copies of relevant journal and conference papers authored and co-authored by the instructor.

Instructor

Dr. Maurizio Collu is Senior Lecturer in Dynamics of Offshore Structures at Cranfield University, CEng, MRINA, FHEA, MEI. He is also the Course Director of the 5 MScs in Offshore and Ocean Technology at Cranfield University. Working in the Offshore Renewable Energy Engineering Centre, he is leading the conceptual and preliminary design of offshore support structures for the emerging floating wind turbine industry.

He collaborates with renewables start-up and SME performing the conceptual and preliminary designs of floating support structures for the offshore renewable devices.

He had been in charge of the conceptual design of the floating support structure in the £2.8m ETI funded project NOVA, and coordinated the development of a coupled model of dynamics for floating wind turbines for the EU funded FP7 project H2Ocean.

He is serving on the ITTC Ocean Engineering Committee from September 2014, and he regularly presents his work at international seminar and peer-reviewed conferences on the topic (OMAE, EWEA, ISOPE). Maurizio sits in the OMAE Ocean Renewable Energy technical committee since 2012. He regularly publishes on the topic on international, peer-reviewed journals, and is reviewer for a number of ocean engineering and energy international journals. He wrote the chapter on "Design of Offshore Floating Wind Turbines" in a new multi — contributor Elsevier book entitled "Offshore Wind Farms: Technologies, Design & Operation" to be released in March 2016.

Registration

You can register for the CORE 2016 Conference by sending us the below given form or register online at http://www.asranet.co.uk/Conferences/OffshoreRenewableEnergy

Name (PLEASE PRINT) _____

Designation _____

Organization _____

Address _____

_____

Telephone _____

Fax _____

Email _____

☐ **I wish to register for the Conference at a normal cost of £450 [£300 for students only] plus VAT (UK only)**

☐ **Please invoice me at the above address**

☐ **Please send me information on local hotels**

Signature _____

Date _____

The completed forms together with a cheque in pounds sterling payable to ASRANet Ltd. should be sent to us by post or email:

ASRANet Ltd.
5 St Vincent Place
Glasgow
UK
G1 2DH
E: info@asranet.co.uk
W: www.asranet.co.uk

Sponsorship & Exhibition Space

Sponsorship

Cost £2,250

Package Includes

- 2 Free Delegate Registration
- Company Logo in the Conference Programme
- Company Logo in the Book of Abstracts
- Company advert in the Book of Abstract (A4 Size)
- Advert in the Conference Proceedings (USB)

Exhibition

Cost £1,125

Package Includes

- 1 Free delegate registration
- 1 Display table (1800 x 1200 mm)
- Display material: Published material, Structural component
- Display Banners

Contact

Glyn Butler
Business Development Manager

ASRANet Ltd
St Georges Building
5 St Vincent Place
Glasgow
G1 2DH

E: glyn.butler@asranet.co.uk
T: +44 141 275 4801
F: +44 141 275 4800
W: www.asranet.co.uk