ewtec 2011

European Wave and Tidal Energy Conference

9th European Wave and Tidal Energy Conference

University of Southampton

5-9 September 2011

Conference Handbook

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www.ewtec.org

Time	Sunday	Monday			Tuesday			Wednesday			Thursday			Friday
07:30-08:00														
08:00-08:40		Registration			Registration			Registration			Registration			
08:40-10:40					Session III			Session VI			Session IX			
		09:15:10:00	Refreshments		EEE	Nightingale	Annex	EEE	Nightingale	Annex	EEE	Nightingale	Annex	09:00-10:40
		10:00-11:10	Opening Ceremony EEE Theatre		Marine current resource and modelling - 2	Wave energy converter testing	Control of wave energy converters	Marine current energy converter testing	Technology for marine energy resource characterisation	Wave energy converter power take off systems -2	Marine current energy converters: factors affecting performance	Wave energy converter modelling - 3	Marine energy converters: transmission and power quality	Closing Ceremony EEE Theatre
10:40-11:20					Refreshments			Refreshments				Refreshments		Refreshments
11:20-13:00		Session I			Session IV			Session VII			Session X			
		EEE	Nightingale	Annex	EEE	Nightingale	Annex	EEE	Nightingale	Annex	EEE	Nightingale	Annex	
		Marine current resource and modelling - 1	Wave energy converter modelling - 1	Deployment, maintenance, and mooring for WEC	Environmental assessment	Modelling marine current energy converter arrays - 1	Novel designs and installations of marine energy converters	Wave energy resource and modelling - 2	Marine current energy converter modelling - 1	Marine energy converter materials and construction	Wave energy converter power take off systems -3	Marine current energy converter modelling - 2	Deployment, maintenance, and mooring for MEC	
13:00-14:00		Lunch			Lunch			Lunch			Lunch			
14:00-16:00	14:00-18:20	Session II			Session V			Session VIII			Session XI			
	Workshop 1	EEE	Nightingale	Annex	EEE	Nightingale	Annex	EEE	Nightingale	Annex	EEE	Nightingale	Annex	
	Nightingale	Wave energy resource and modelling - 1	Design and optimisation of marine current energy converters - 1	Marine energy policy and standards	Wave energy converter modelling - 2	Design and optimisation of marine current energy converters - 2	Wave energy converter power take off systems -1	Environmental and economic assessment	Wave energy converter arrays	Modelling marine current energy converter arrays - 2	Marine energy converter deployment, operation and impacts	Design and optimisation of wave energy converters	Control of marine energy converters	
16:00-16:30		Refreshments			Poster I /			Poster II /				Refreshments		
16:30-17:00	Registration /	Symposium: Policy EEE Theatre	Symposium: Showcasing the US Nightingale		Refreshments			Refreshments				Symposium:		
17:00-18:00	Arlott Bar open				16:30-18:00 Workshop 2 Annex	16:30-17:30 Workshop 3 Nuffield			Symposium: Showcasing the UK EEE Theatre			Marine Parks EEE Theatre		
18:00-18:30														
18:30	Arlott Bar open	Welcome Reception						Conference Banquet				Curry Evening		

Welcome

A message from the Chair of EWTEC2011

Dear EWTEC 2011 Delegates

Welcome to the 9th European Wave and Tidal Energy Conference (EWTEC) hosted by the Sustainable Energy Research Group at the University of Southampton.

The first EWTEC Conference was held in 1993 and has now become the most important global event in wave and tidal energy conversion. The Conference is held every two years, and in 2005 expanded to include the developing tidal energy sector.

The 9th conference - EWTEC 2011 in Southampton - will, I hope, provide a global focus for all activities in wave and marine current energy conversion technologies, research, development and demonstration. EWTEC2011 has already achieved many milestones, including providing a permanent web portal for the Conference series and receiving an unprecedented number of abstracts (350), with the result that 220 papers will be presented at this year's Conference. For the first time, the EWTEC2011 Conference will include unique symposia, such as Policy, Showcasing UK and US activities and Marine Parks, and there will be an exhibition and special workshops throughout the week of the Conference. EWTEC2011 will be the largest yet with around 400 registrations and attended by representatives from 28 countries.

The last two years have witnessed considerable progress in wave and tidal energy development, with many large scale deployments occurring at sea. Of particular note was the recent announcement (by the UK's Crown Estate) of a 1.6GW target of technology implementation by 2020 in sites in the Pentland Firth in the UK. This target alone represents a projected investment of over £4.3 billion and, if successful, has the potential to propel the UK and the implemented technologies associated with the project onto a higher platform towards achieving a truly global industry. It is important to remember that the developmental route of many of these technologies began through discussion and debate within the EWTEC conference series. Hence, all these activities will further enhance the standing of EWTEC, and the community needs to strengthen the conference series' structures to allow the continuation of balanced debates that are needed to address this growth potential and the exploitation of wave and tidal energy resources for sustainable electricity production.

I would like to take this opportunity to express my heartfelt gratitude to all reviewers, without whom the high quality of the Conference's technical programme would not have been achievable. I would also like to thank the sponsors of the Conference for making the enhanced social activities of EWTEC2011 possible and to my colleagues on the EWTEC2011 Management Committee for all their hard work and for contributing to the strategic planning that we hope will make EWTEC2011 a unique and successful event. I would like to conclude by thanking all attendees for coming to Southampton to support the wave and tidal energy research and development and to debate the pertinent issues related to this important energy field. I hope that for each of you, the EWTEC2011 Conference will be a memorable event.

Professor AbuBakr S. Bahaj
Chair of EWTEC 2011,
University of Southampton

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Venue

The ninth European Wave and Tidal Energy Conference 2011 is based at the University of Southampton's Highfield campus. Upon arrival please make your way to the conference registration in the foyer of the Life Sciences building (85). Here you will receive your conference pack. The Life Sciences building also houses the oral presentation upload office, IT facilities and meeting/working areas. Please refer to the map at the end of this handbook.

The opening and closing ceremonies as well as the symposia, will take place in the conference's main lecture theatre in building EEE (32). The three parallel oral technical sessions will be held simultaneously in the EEE (32), Nightingale (67) and Annex (2a) buildings, while the poster displays and sessions will be located in the Foyer of the Annex (2a) building.

Transportation

For information on how to reach the University of Southampton's Highfield campus please see http://www.soton.ac.uk/aboutus/whereissoton/index.html.

The Highfield campus is serviced frequently by local bus services, departing from the Uni-Link Interchange providing excellent connectivity to the city centre, airport and train stations.

If you are travelling by car, please use the University's Hampton Car park. You will need to obtain a free parking permit from the registration desk (building 85). Please be aware that there are limited numbers of permits, so please advise us as soon as possible, should one be required. If you are staying in Halls of Residence accommodation, parking spaces and free permits will be provided for you there.

Should you require a taxi, we recommend Radio Taxis Ltd (0800 666666 / 02380 666666) or ATS Taxis Ltd (02380 222222).

Refreshments, Lunch and Evening Events

Morning and afternoon refreshments will be served in the Annex Foyer (2a) and the Staff Social Centre (38). Lunch will be served in the Staff Social Centre only. The Staff Social Centre is also the venue for Monday's welcome reception and Thursday's Curry Evening.

To avoid queues during breaks, please utilise all three entrances to the building (see map on p.16). There are six different service stations within the Staff Social Centre. Please use one of the service stations that the colour on your name badge coincides with.

Special dietary requirements

Vegetarian options will be regularly available. If you indicated any other special dietary requirements during your online registration, the catering staff on site and at the banquet will be aware of these. Please make yourself known to them.

Banquet

If you purchased banquet tickets with your registration, you will find these inside your name badge wallet. A limited number of further tickets will be available for purchase at the registration desk. The banquet will be held on Wednesday 7 September 2011 from 19:00 at the Botleigh Grange Hotel. Busses to the venue will be leaving from the Uni-Link Interchange on the Highfield Campus at 18:45. Return busses will be leaving from outside the venue from 22:30 depending on demand and will stop at major hotels and Halls of Residence accommodation as well as the University campus.

Internet access

On the back of your name badge you should find personalised log-in details for the University's IT facilities and wireless internet available across the campus. Please be aware that by using these details, you agree to abide by the University's terms and conditions for the use of computers and data communications networks.

Information

Conference information and help will be available in the Life Sciences building (85) throughout the conference. There will also be numerous conference helpers spread around campus, easily recognisable by their blue shirts. Please do not hesitate to ask should you have any questions.

Oral presentations

Please upload your presentation at least three hours prior to the start of your session. This is paramount to ensure smooth running of the programme. Staffed upload facilities are located in room 2213 in the Life Sciences building (85) and will be available 16:00-18:30 on Sunday and 8:00-18:00 Monday through Thursday.

Each oral presentation should be 15 minutes in length, with a subsequent 5 minutes question time. It is essential that you keep to the allotted time, as you will otherwise disadvantage subsequent speakers. Be advised, that the session chairs have been asked to ensure that all presentations do not exceed the allotted time limit. They will therefore cut off any presentations that overrun.

Poster presentations

Posters will be displayed in the Foyer of the Annex building (2a) for two days (Mon-Tue for POSTER SESSION I, Wed-Thurs for POSTER SESSION II). During the poster sessions (session I: Tue 16:00-17:00, session II: Wed 16:00 -17:00) the poster's presenter should be stationed by his/ her poster available to answer questions.

POSTER SESSION I: Please hand in your poster at the registration desk in the Life Sciences building (85) Sunday afternoon or Monday morning and collect it from the registration desk from 8:00 on Wednesday.

POSTER SESSION II: Please hand in your poster at the registration desk no later than Wednesday 9:00 and collect it from the registration desk from 16:00 on Thursday.

Awards

Throughout the technical programme delivery, oral and poster presentations will be judged based on their content and presentation. Awards for the best oral and poster presentations will be given during the closing ceremony.

Workshops

Workshop 1 (Sunday 14:00-18:20, Nightingale Theatre):
UK/Korea Ocean Energy Collaboration Workshop
(capacity limited to 30 delegates)

Workshop 2 (Tuesday 16:30-18:00, Annex Theatre H):
Showcasing pan-European collaboration, the CORES project

Workshop 3 (Tuesday 16:30-17:30, Nuffield Theatre A):
Developments in the testing of Marine Turbine Blades

Workshop 4 (Wednesday 14:00-16:00, Nuffield Theatre A):
The DEXAWAVE development model – how to scale wave energy converters from 1:10 scale models to full size, commercial wave parks in Malta

Symposia

1. Policy Symposium (Monday 16:30-18:30):

The symposium will begin with five minute answers by the invited speakers to two questions and will be followed by interactive discussions between the speakers and the audience. The questions to be answered are:

a. What do you understand to be the current direction of UK wave and tidal energy policy? Does it need to be changed? If so what changes do you think are required for technology rollout?
b. Is the UK government aiding wave and tidal energy developers sufficiently? What additional mechanisms do you feel will be needed to deliver the scale up, expansion and installations of the technology?

Chair: *Geoff French, Scott Wilson*
Invited Speakers:
Gareth Davies, Aquatera
Ben Hamer, Halcrow
Charles Oglivie, Energy Consultant
Doug Parr, Greenpeace

2. Showcasing the US Symposium (Monday 16:30-18:30):
The symposium focuses on the US's Marine Energy Activities
Chair: *Mike Reed, US Department of Energy*
Invited Speakers:
Roger Bagbey, Cardinal Engineering
Rich Jepsen, Sandia National Laboratories
Angus Norman, Ocean Power Technologies
Tim Ramsey, US Department of Energy

3. Showcasing the UK Symposium (Wednesday 17:00-18:30):
The symposium focuses on the UK's Marine Energy Activities and will consist of the following 20 minute presentations, followed by questions from the audience.
Chair: *AbuBakr Bahaj, University of Southampton*

a. TGL Tidal Stream Concepts and Developments - *Alex Alliston, Rolls Royce Energy Systems*
b. The Evolution of Pelamis Wave Energy Convertors - *Max Carcas, Pelamis Wave Power*
c. Status of Marine Current Turbine: SeaGen Technology and Beyond - *Peter Fraenkel, Marine Current Turbines*
d. Predicting the True Cost of Power for New Technologies in the Marine Renewable Energy Sector - *Paddy O'Kane, Aquamarine Power*

4. Marine Parks Symposium (Thursday 16:30:18:00):
The symposium focuses on how to make the transition from a prototype to a full-scale marine energy farm and will consist of five minute presentations by the invited speakers, followed by interactive discussions between the speakers and the audience.
Chair: *George Eustice, MP Camborne, Redruth and Hayle*
Invited Speakers:
Joao Cardoso, REN
Representative of Norway
Claire Gibson, Wave Hub
Representative from the Isle of Wight Council

Sunday 4 September

14:00-18:20	**UK/Korea Ocean Energy Collaboration Workshop Nightingale Theatre**
16:00-18:30	**Registration and presentation upload**
16:00-21:00	**Arlott Bar in Staff Social Centre is open**

Monday 5 September

07:30	**Registration**		
09:15	**Refreshments / Exhibition**		
	EEE Theatre		
10:00-11:10	**Opening Ceremony:** Welcome and introductions - *Conference Chair Prof. AbuBakr Bahaj* Welcome to the University of Southampton - *Deputy Vice-Chancellor Prof. Phil Nelson* The Governor of Hawaii Proclamation - *Representative Cynthia Thielen* Wave and Tidal Energy: An assessment from the UK's Parliamentary Renewable and Sustainable Energy Group - *Dr Alan Whitehead MP, Chairman of PRASEG* EWTEC 2011: Plans for the week - *Prof. AbuBakr Bahaj* Policy and Strategies for the rollout of wave and tidal energy - *Secretary of State for the Department of Energy and Climate Change: Mr Chris Huhne MP*		
	EEE Theatre	**Nightingale Theatre**	**Annex Theatre H**
Session I	**Marine current resource and modelling - 1**	**Wave energy converter modelling - 1**	**Deployment, maintenance, and mooring for WEC**
Chair	*Luke Blunden - University of Southampton, UK*	*Gareth Thomas - University College Cork, IE*	*Antonio Falcao - Instituto Superior Tecnico, PT*
11:20	Numerical modelling of high energy tidal regions using three-dimensional CFD *Ian Jones - ANSYS UK Ltd, UK*	Validation of a spectral-domain model of an OWC using physical model data *Matt Folley - Queen's University Belfast, UK*	Two Impediments to Wave Energy and Ideas for Removing Them *Stephen Salter - University of Edinburgh, UK*
11:40	Characteristics of the Onset Flow Turbulence at a Tidal-Stream Power Site *Ian Milne - The University of Auckland, NZ*	Performance Evaluation of a Two-body Heaving WEC with Latching Control Using a New Numerical Method *Joao Henriques - IDMEC/Instituto Superior Tecnico, PT*	Lysekil Research Site, Sweden: Status Update *Erik Lejerskog - Uppsala University, SE*
12:00	Phasing of tidal current energy around the UK and potential contribution to electricity generation *Abhinaya Iyer - University of Edinburgh, UK*	Implementation Verification and Validation of a Time Domain Model to Describe the Dynamics of WECs *Marco Alves - WavEC, PT*	Weather Windows for Device Deployment at UK Test Sites: Availability and Cost Implications *Rich Walker - University of Exeter, UK*
12:20	Modelling the Hydrodynamic Characteristics of Tidal Flow in the Pentland Firth *Susana Baston - International Centre of Island Technology, UK*	Sensitivity of point absorbing WECs to physical parameters of the reacting body *Scott Beatty - University of Victoria, CA*	Extreme environmental parameters for Wave Energy Converters and moorings at bimep *Olivier Duperray - Tecnalia, ES*
12:40	Energy Potential of a Tidal Fence Deployed Near a Coastal Headland *Scott Draper - University of Western Australia, AU*	Complementary use of a linear potential code, a RANS and a SPH solver for the optimisation of a Wave Energy Converter *Olivia Thilleul - HydrOcean, FR*	Pico OWC - the Frog Prince of Wave Energy? Recent autonomous operational experience and plans for an open real-sea test centre in semi-controlled environment *Frank Neumann - Wave Energy Centre, PT*

13:00	Lunch / Exhibition		
	EEE Theatre	**Nightingale Theatre**	**Annex Theatre H**
Session II	**Wave energy resource and modelling - 1**	**Design and optimisation of marine current energy converters - 1**	**Marine energy policy and standards**
Chair	*Teresa Pontes, IDMEC/IST, PT*	*Fred Gardner -Teamwork Technology, NL*	*David Ingram, University of Edinburgh, UK*
14:00	Predictability of the Power Output of Three Wave Energy Technologies in the Danish North Sea *Julia Fernandez Chozas - Spok ApS / Aalborg University, DK*	Influence of Tidal Parameters on SeaGen Flicker Performance *Joseph MacEnri - ESB International, IE*	Equimar: Development of Best Practices for the Engineering Performance Appraisal of Wave and Tidal Energy Convertors. *Cameron Johnstone - University of Strathclyde, UK*
14:20	Modelling and Description of Omnidirectional Wave Spectra *Ed Mackay - GL Garrad Hassan, UK*	Torque Ripple and Power in a Variable Pitch Vertical Axis Tidal Turbine *Jonathan Winchester - Lancaster University, UK*	Standardized Performance Assessment of Wave Energy Converters *Matt Folley - Queens University Belfast, UK*
14:40	Wave Hub test facility: sea state directional analysis from an array of 4 measurement buoys *Jean-Baptiste Saulnier - University of Exeter, UK*	Tow tank tests of tethered marine turbines to determine system dynamic response *Stephanie Ordonez-Sanchez - University of Strathclyde, UK*	Risk Management in Wave and Tidal Energy *Jonathan Flinn - Det Norske Veritas, UK*
15:00	Wave Energy Resource Characterization of the Atlantic Marine Energy Test Site *Brendan Cahill - University College Cork, IE*	Design and analysis of a bi-directional ducted tidal turbine *Conor Fleming - University of Oxford, UK*	Performance Evaluation of Wave Dragon Wave Energy Converter Applying a Methodology Proposed by the Equimar Project *Stefano Parmeggiani - Wave Dragon Ltd, UK*
15:20	Joint exploitation of wave and offshore wind power *Lucy Cradden - University of Edinburgh, UK*	Reliability-based design of rotor blades in tidal stream turbines *Dimitri Val - Heriot-Watt University, UK*	Implementing Agreement on Ocean Energy Systems: Next Five Years *John Huckerby - Aotearoa Wave and Tidal Energy Association, NZ*
15:40	Characterization of Wave Climate at Hanstholm Location with Focus on the Ratio between Average and Extreme Waves Heights *Lucia Margheritini - Aalborg University, DK*	Investigation of the Fundamental Operation of a Novel Tidal Energy Device at Circa 1:16 Scale - Tidal Flyer Junior *Theo Devaney - Open Ocean Energy Ltd, IE*	Benefits of Standards to Ocean Energy Development *John Griffiths - European Marine Energy Centre Ltd, UK*
16:00	**Refreshments /Exhibition**		
16:30	**Symposium: Policy** **EEE Theatre** see p.3 for details		**Symposium: Showcasing the US** **Nightingale Theatre** see p.3 for details
18:30	**Welcome Reception** **Staff Social Centre**		

Tuesday 6 September

08:00	Registration		
	EEE Theatre	**Nightingale Theatre**	**Annex Theatre H**
Session III	**Marine current resource and modelling - 2**	**Wave energy converter testing**	**Control of wave energy converters**
Chair	*Richard Willden - University of Oxford, UK*	*Brian Holmes - HMRC, University College Cork, IE*	*Antonio Sarmento - Wave Energy Centre, PT*
08:40	Appraising the Extractable Tidal Energy Resource of the UK's Western Coastal Waters *Nick Yates - University of Liverpool, UK*	Experimental Wave Cancellation using a Cycloidal Wave Energy Converter *Stefan Siegel - US Air Force Academy, US*	Control strategies for arrays of wave energy devices *Jan Westphalen - National University of Ireland Maynooth, IE*
09:00	Characterisation of a Tidal Energy Site: Hydrodynamics and Seabed Structure *Matthew Easton - Environmental Research Institute, UK*	Wave pressures and loads on a small scale model of the Svaheia (Stavanger, Norway) SSG pilot project *Diego Vicinanza - Second University of Naples, IT*	Control strategies for the ISWEC Wave Energy System *Giovanni Bracco - Politecnico di Torino, IT*
09:20	Potential Array Sites for Tidal Stream Electricity Generation off the Pembrokeshire Coast *Iain Fairley - Swansea University, UK*	An Experimental Study on Generating Efficiency of a Wave Energy Converter "Backward Bent Duct Buoy" *Yasutaka Imai - Saga University, JP*	Reactive Causal Control of a Linear Generator in Irregular Waves for Wave Power System *Bin Li - Institute for Energy Systems, The University of Edinburgh, UK*
09:40	Modelling the hydrodynamic impacts due to tidal lagoons in the upper Bay of Fundy, Canada *Andrew Cornett - NRC Canadian Hydraulics Centre, CA*	Two-Dimensional Motions of a Shallow Draft Wave Energy Converter Undergoing Regular Wave Excitation *Sam Weller - University of Manchester, UK*	State dependent feed-forward control of a wave energy converter model *Philip Cross - Lancaster University, UK*
10:00	The open boundary problem in basin scale modelling of tidal energy extraction *Thomas Adcock - University of Oxford, UK*	Experiments on the Wave Piston wave energy converter *Elisa Angelelli - Department of Civil Engineering of Aalborg University, DK*	Toward a biologically inspired, neural control mechanism for multiple degree of freedom wave energy converters *Timothy Mundon - Kleinschmidt Associates, US*
10:20	Comparison of different resolution models and observed current profiles in the Bay of Fundy, Canada using turbine-relevant metrics *Joel Culina - Acadia University, CA*	Laboratory observations of waves in the vicinity of WEC arrays *Merrick Haller - Oregon State University, US*	Optimal Causal Control of an Ocean Wave Energy Converter in Stochastic Waves *Jeff Scruggs - Duke University, US*
10:40	**Refreshments / Exhibition**		
	EEE Theatre	**Nightingale Theatre**	**Annex Theatre H**
Session IV	**Environmental assessment**	**Modelling marine current energy converter arrays - 1**	**Novel designs and installations of marine energy converters**
Chair	*Deborah Greaves - University of Plymouth, UK*	*Luke Myers - University of Southampton, UK*	*John Chaplin - University of Southampton, UK*
11:20	Measurements of shoreline wave action to establish possible environmental and ecological effects from wave energy converter arrays. *Robert Beharie - Heriot Watt University, UK*	A Large-Eddy Simulation Study of Wake Propagation and Power Production of an Array of Tidal-Current Turbines *Robert Thresher - National Renewable Energy Lab, US*	Free floating clam wave energy converter *Francis Farley - University of Southampton, UK*
11:40	Short term temporal behavioural responses in Pollack, Pollachius pollachius to marine tidal turbine devices; a combined video and ADCP doppler approach. *Melanie Broadhurst - Imperial College London, UK*	A decision support tool for the optimisation of large tidal power arrays *Sonja Pans - DHI, UK*	WindWaveFloat: Combining offshore wind turbines and WEC in a single structure. *Kevin Banister - Principle Power Inc, US*
	Continued on next page	Continued on next page	Continued on next page

12:00	Assessment Method of Sound Radiated by Cyclically Operating Wells Turbines *Ralf Starzmann - University of Siegen, DE*	Modelling and Optimisation of Tidal Arrays *Neil Adams - Frazer-Nash Consultancy, UK*	Irregular Deep Ocean Wave Energy Conversion Using a Cycloidal Wave Energy Converter *Tiger Jeans - University of New Brunswick, CA*
12:20	Hydrodynamics perturbations generated by waves and submerged structures such as energy converters. *Adrien Poupardin - Laboratoire Ondes et Milieux Complexes, FRE/CNRS 3102 et Universite du Havre, FR*	Applying a numerical decision-making tool for tidal current turbine (TCT) planning projects to the Puget Sound estuary - Early Results *Thomas Roc - University of Plymouth, UK*	The bioWAVE and bioSTREAM Test Unit *Gerold Kloos - BioPower Systems Pty Ltd, AU*
12:40	Impact of climate change on wave energy generation near the Wave Hub, Cornwall, UK *Dominic Reeve - University of Plymouth, UK*	Interaction Effect Analysis for Tidal Current Power Farm Feasibility Study Applied to Projects in Korea *Chul Jo - Inha University, KR*	Performance Evaluation of the Wavestar Prototype *Laurent Marquis - Wave Star A/S, DK*
13:00	**Lunch / Exhibition**		
	EEE Theatre	**Nightingale Theatre**	**Annex Theatre H**
Session V	**Wave energy converter modelling - 2**	**Design and optimisation of marine current energy converters - 2**	**Wave energy converter power take off systems - 1**
Chair	*Alain Clement - Ecole Centrale de Nantes, FR*	*Cameron Johnstone - University of Strathclyde, UK*	*Pierpaolo Ricci - Tecnalia, ES*
14:00	Nonlinear Modelling of the Dynamics of a Free Floating Body *Matthieu Guerinel - Instituto Superior Tecnico, PT*	The GESMEY Project.Design and development of a second generation TEC *Luis R. Rivas - Technical University of Madrid (UPM), ES*	Numerical and Experimental Investigation of Performance of Heaving WECs Coupled with DC Generators *Spyros Mavrakos - National Technical University of Athens, GR*
14:20	A New Numerical Representation of Wave Energy Converters in a Spectral Wave Model *Katherine Silverthorne - Queen's University Belfast, UK*	Effect of a diffuser on the power production of an ocean current turbine *Josh Reinecke - Stellenbosch University, ZA*	A Novel High-Efficiency Impulse Turbine for Use in Oscillating Water Column Devices *Shahab Natanzi - Dresser-Rand Company, UK*
14:40	A Study on the Wave Energy Conversion by Submerged Bottom-hinged Plates *Rui Gomes - IDMEC, Instituto Superior Tecnico, PT*	Design and model testing of an optimized ducted current turbine *Romain Luquet - DGA Hydrodynamics, FR*	Performance of a Wells turbine in a OWC device in comparison to laboratory tests *Sergio Camporeale - Politecnico di Bari, IT*
15:00	Parametric models for WEC performances *Remy Pascal - The University of Edinburgh, UK*	Embedded RANS-BEM Tidal Turbine Design *Simon McIntosh - University of Oxford, UK*	Snapper WEC Device Development - The Grid Interface System *Paul McKeever - Narec, UK*
15:20	Numerical simulation of a submerged Wave Energy Converter (Torres Wave Energy Device - TWED) *Raul Guanche - IH Cantabria, ES*	Flow Field and Performance Analysis of Bidirectional and Open-centre Ducted Tidal Turbines *Clarissa Belloni - University of Oxford, UK*	Offshore Testing of a floating OWC Device with Movable Guide Vane Impulse Turbine Power Take-Off *Dara O'Sullivan - University College Cork, IE*
15:40	Time Domain Modelling of Floating Wave Energy Devices Using Non-Linear Shock Protection Force Components *Donnacha Gallagher - Dundalk Institute of Technology, IE*	Structural and hydrodynamic model testing of the Transverse Horizontal Axis Water Turbine *Ross McAdam - University of Oxford, UK*	Transient Calculation of Impulse Turbine for Oscillating Water Column Wave Energy Convertor *Jiyuan Jin - Korea Maritime University, Busan, KR*
16:00-17:00	**Poster Session I / Refreshments / Exhibition**		
	Annex Theatre H	**Nuffield Lecture Theatre A**	
16:30	**Workshop 2: Showcasing pan-European collaboration, the CORES project**	**Workshop 3: Developments in the testing of Marine Turbine Blades**	

Wednesday 7 September

08:00	Registration		
	EEE Theatre	**Nightingale Theatre**	**Annex Theatre H**
Session VI	**Marine current energy converter testing**	**Technology for marine energy resource characterisation**	**Wave energy converter power take off systems - 2**
Chair	*Chul Jo - Inha University, KR*	*Merrick Haller - Oregon State University, US*	*Weon Koo - University of Ulsan, KR*
08:40	Operational issues surrounding the use of towing tanks for performance quantification of marine current energy converters *Luke Myers - University of Southampton, UK*	A Review of Wave and Tide Measurement Gauges for Use in Renewable Energy Offshore Production Regions *Christian Senet - Federal Maritime and Hydrographic Agency, DE*	A New Radial Self-rectifying Air Turbine for Use in OWC Wave Energy Converters *Antonio Falcao - Instituto Superior Tecnico, PT*
09:00	The Soderfors Project: Construction of an Experimental Hydrokinetic Power Station *Katarina Yuen - Uppsala University, SE*	Extreme value analysis of tidal current velocity perturbations *Samuel Harding - The University of Edinburgh, UK*	Multi-objective Differential Evolutionary Algorithm for Preliminary Design of a Direct-Drive Power Take-Off *Marcos Blanco - CIEMAT, ES*
09:20	Arguments for modifying the geometry of a scale model rotor *Jo Whelan - GL Garrad Hassan, UK*	Tidal Current Measurement Using the TanDEM-X Satellite Formation *Steffen Suchandt - German Aerospace Center (DLR), DE*	Hydrodynamic and Electromechanical Simulation of a Wave Energy Converter with a Novel Non-Linear PTO *Richard Crozier - The University of Edinburgh, UK*
09:40	Scaling of a tidal turbine using non-dimensional parameters *Sian Tedds - University of Liverpool, UK*	VHF Ocean Radar for surface currents appraisal at ocean power sites *Malcolm Heron - PortMap Remote Ocean Sensing, AU*	Design and Control of a Hydraulic Power Take-off for an Axi-symmetric Heaving Point Absorber *Kristof Schlemmer - Hydac System GmbH, DE*
10:00	Experimental Investigation Of Horizontal Axis Tidal Stream Turbines *Rob Poole - University of Liverpool, UK*	Study of Sea-State Variability and Wave Groupiness Using TerraSAR-X Synthetic Aperture Radar Data *Teresa Pontes - IDMEC / IST, PT*	Development of air turbines for small power OWC plants *Esmeralda Tuccimei - Sapienza University of Rome, IT*
10:20	Investigating experimental techniques used for measurement of the downstream wake of a tidal turbine *Samuel Rose - University of Strathclyde, UK*	Using HF radar to measure the directionality of the wave energy resource. *Lucy Wyatt - Univeristy of Sheffield, UK*	Efficiency calculation of direct-drive power take-off *Francisco Garcia - WEDGE GLOBAL, ES*
10:40	Refreshments / Exhibition		
	EEE Theatre	**Nightingale Theatre**	**Annex Theatre H**
Session VII	**Wave energy resource and modelling - 2**	**Marine current energy converter modelling - 1**	**Marine energy converter materials and construction**
Chair	*Lucy Wyatt - University of Sheffield, UK*	*Bob Thresher - NREL, US*	*Stephen Salter - University of Edinburgh, UK*
11:20	Wave resource characterization and WEC selection - a comprehensive methodology applied to NW Spain *Gregorio Iglesias - University of Santiago de Compostela, ES*	Navier-Stokes Modelling for Contra-Rotating Tidal Turbines *Tom McCombes - The University of Strathclyde, ES*	Dynamic Mechanical Analysis of Rubber Used in Anaconda Testing *Valentin Heller - formerly University of Southampton, UK*
11:40	Sea state characterisation for Wave Energy performance assessment at the Biscay Marine Energy Platform *Pierpaolo Ricci - Tecnalia, ES*	3D CFD modelling of tidal turbine performance with validation against laboratory experiments *Richard McSherry - Narec, UK*	Composite Blades for Tidal Turbines Versus Wind Turbines at Multi-Megawatt Scale *Luke McEwen - Gurit, UK*
	Continued on next page	Continued on next page	Continued on next page

12:00	Incident wave climate at the OWC Pico plant: Validation of a feed-forward based propagation method (ANN) and a numerical simulation (SWAN) with measured data *Izan Le Crom - Wave Energy Centre, PT*	Development and validation of a high order numerical solver for cross-flow turbine hydrodynamics *Esteban Ferrer - University of Oxford, UK*	Prediction of long-term fatigue damage of a hydraulic cylinder of a wave energy converter subjected to internal fluid pressure induced by wave loads *Limin Yang - Norwegian University of Science and Technology, NO*
12:20	Assessment of Wave Basin Homogeneity for Wave Energy Converter Array Studies. *Louise O'Boyle - Queen's University Belfast, UK*	Results from blade element momentum and RANS analyses of a practical full-scale horizontal axis tidal current turbine *Gareth Gretton - University of Edinburgh, UK*	Evaluation of the durability of composite tidal turbine blades *Peter Davies - IFREMER Centre de Brest, FR*
12:40	The accuracy of modelling waves at coastal locations *Luigi Cavaleri - ISMAR, IT*	The accuracy of the actuator disc-RANS approach for predicting the performance and far wake of a horizontal axis tidal stream turbine *William Batten - University of Southampton, UK*	Tribology and surface engineering of marine energy systems *Robert Wood - nCATS, University of Southampton, UK*
13:00	**Lunch / Exhibition**		
	EEE Theatre	**Nightingale Theatre**	**Annex Theatre H**
Session VIII	**Environmental and economic assessment**	**Wave energy converter arrays**	**Modelling marine current energy converter arrays - 2**
Chair	*Gregorio Iglesias - University of Santiago de Compostela, ES*	*Lars Bergdahl - Chalmers University, SE*	*Ian Masters - Swansea University, UK*
14:00	Performance and economic feasibility analysis of 5 wave energy devices off the west coast of Ireland *Gordon Dalton - Hydraulics and Maritime Research Centre, IE*	Impact of the separating distance between interacting wave energy converters on the overall energy extraction of an array *Bruno Borgarino - Ecole Centrale de Nantes, FR*	The Development of a Tool for the Design and Optimisation of Tidal Stream Turbine Arrays *Mat Thomson - GL Garrad Hassan, UK*
14:20	Environmental aspects of developing Ireland's Atlantic Marine Energy Test Site (AMETS) *Paddy Kavanagh - ESB International, IE*	The development of a tool for optimising arrays of wave energy converters *Benjamin Child - GL Garrad Hassan, UK*	The Influence of Tidal Stream Turbine Spacing on Performance *Rami Malki - Swansea University, UK*
14:40	Integrated WEC system optimisation - Achieving balanced technology development and economical lifecycle performance *Jochem Weber - Wavebob, IE*	Experimental Evaluation of the Performances of an Array of Multiple Oscillating Water Columns *Davide Magagna - University of Southampton, UK*	The applicability of semi-empirical wake models for tidal farms *Moritz Palm - Bluewater Energy Services, NL*
15:00	Applying Ecological Risk Assessment Methodology for Outlining Ecosystem Effects of Ocean Energy Technologies *Linus Hammar - Chalmers University of Technology, Energy and Environment, SE*	Hydrodynamics around DEXA devices and implications for coastal protection *Barbara Zanuttigh - University of Bologna - DICAM, IT*	Numerical analysis of the acceleration and wake effects resulting from changes in tidal turbine array position in a channel *Tim Daly - University of Southampton, UK*
15:20	Adjusting the financial risk of tidal current projects by optimising the 'installed capacity/capacity factor'-ratio already during the feasibility stage *Ralf Bucher - University of Edinburgh, UK*	On the Performance of a Resonant Breakwater for Protecting Coast *Pasquale Filianoti - University Mediterranea of Reggio Calabria, IT*	Layout Optimisation of 1st-generation tidal energy arrays *Bradley Keogh - University of Southampton, UK*
15:40	The Contribution of Environmental Siting and Permitting Requirements to the Cost of Energy for Marine and Hydrokinetic Devices *Andrea Copping - Pacific Northwest National Laboratory, US*	Optimisation of Point-Absorber Arrays *Raffaello Antonutti - University of Trieste, IT*	Noise Modelling of Tidal Turbine Arrays for Environmental Impact Assessment *Thomas Lloyd - University of Southampton, UK*
16:00	**Poster Session II / Refreshments / Exhibit ion**		
17:00-18:30	**Symposium: Showcasing the UK** **EEE Theatre,** see p.3 for details		
19:00	**Banquet, Botleigh Grange Hotel, Busses depart from Hi ghfield Interchange at 18:45**		

08:00	Registration		
	EEE Theatre	**Nightingale Theatre**	**Annex Theatre H**
Session IX	**Marine current energy converters: factors affecting performance**	**Wave energy converter modelling - 3**	**Marine energy converters: transmission and power quality**
Chair	*William Batten - University of Southampton, UK*	*Matt Folley - Queen's University Belfast, UK*	*Frank Neumann - Wave Energy Centre, PT*
08:40	Interaction of Marine Turbines in Close Proximity *Tim O'Doherty - Cardiff University, UK*	Predicting the hydrodynamic pressure in a fixed and floating undamped OWC using a simplified piston model. *Rebecca Sykes - University College Cork, IE*	Challenges Posed by the Integration of Wave Power onto the Irish Power System *David Kavanagh - University College Dublin, IE*
09:00	Tidal Turbine Blade Load Experiments for Oscillatory Motion *Ian Milne - The University of Auckland, NZ*	Assessment of Viscous Damping via 3D-CFD Modelling of a Floating Wave Energy Device *Majid Bhinder - Ecole Centrale de Nantes, FR*	Control strategies for the grid integration of wave energy converters at the BIscay Marine Energy Platform *Elisabetta Tedeschi - Norwegian University of Science and Technology, NO*
09:20	Numerical and Experimental Study of the Interaction Between two Marine Current Turbines *Paul Mycek - LOMC/IFREMER, FR*	Frequency and stochastic domain models for two geometries of the IPS wave power buoy *Jose Candido - IDMEC/IST, PT*	Dynamic Electrical Ratings and the Economics of Capacity Factor for Wave Energy Converter Arrays *Fergus Sharkey - ESB International, IE*
09:40	Probabilistic evaluation of failure rates of mechanical components in tidal stream turbines *Dimitri Val - Heriot-Watt University, UK*	Frequency Domain Analysis on Primary Conversion Efficiency of a Floating OWC -type Wave Energy Converter 'Backward Bent Duct Buoy' *Shuichi Nagata - Saga University, JP*	Transmission Cable Protection and Stabilisation for the Wave and Tidal Energy Industries *James Beale - J P Kenny, UK*
10:00	Interactions between Tidal Turbine Wakes: Experimental Study of a Group of 3-Bladed Rotors *Peter Stansby- University of Manchester, UK*	Assessment of time-domain models of wave energy conversion systems *Adi Kurniawan - Centre for Ships and Ocean Structures, NO*	Flatness-Based Control of a Three-Phase Inverter Connected to Electrical Network *Hani Alhamed Aldwaihi - ISEN, FR*
10:20	An Investigation of the Influence of Free Surface Effects on the Hydrodynamic Performance of Marine Cross-Flow Turbines *Richard Willden -University of Oxford, UK*	Hardware-In-The-Loop Simulation of a Heaving Wave Energy Converter *Chris Signorelli - Wavebob, IE*	Development and Operation of a Power Take Off Rig for Ocean Energy Research and Testing *Judy Rea - HMRC, UCC, IE*
10:40	**Refreshments / Exhibition**		
	EEE Theatre	**Nightingale Theatre**	**Annex Theatre H**
Session X	**Wave energy converter power take off systems - 3**	**Marine current energy converter modelling - 2**	**Deployment, maintenance, and mooring for MEC**
Chair	*Mats Leijon - Uppsala University, SE*	*Tim O'Doherty - Cardiff University, UK*	*Ian Bryden - University of Endinburgh, UK*
11:20	Optimal design of a WEC hydraulic power take-off unit in irregular waves *Christopher Cargo - University of Bath, UK*	Parametrising turbulent marine flows for a blade element momentum model of tidal stream turbines *Michael Togneri - University of Swansea, UK*	Experimental Study of a 2D hydrofoil for application in ocean mooring systems *Tiago Duarte - Instituto Superior Tecnico, PT*
11:40	Construction of a Universal Hydraulic Power Take-Off for Wave Energy Converters. Mathematical Modelling and Validation Testing *Joseba Lasa - TECNALIA, ES*	Automatic Blade Optimization of Tidal Current Turbines Using OpenFOAM *Andreas Ruopp - University of Stuttgart, DE*	The commercialisation of foundation -based flow acceleration structures for marine current energy converters *Jack Giles - University of Southampton, UK*
	Continued on next page	Continued on next page	Continued on next page

12:00	Improved Design of High Solidity Wells Turbine *Marco Torresi - Politecnico di Bari, IT*	A Method for Analysing Fluid Structure Interactions on a Horizontal Axis Tidal Turbine *Rachel Nicholls-Lee - University of Southampton, UK*	Non-linear slack-mooring modelling of a floating two-body wave energy converter *Pedro Vicente - Instituto Superior Tecnico, PT*
12:20	Comparison of Two Alternative Hydraulic PTO Concepts for Wave Energy Conversion *Ronan Costello - COER, National University of Ireland, Maynooth, IE*	Device Modelling, Simulation and Vibration Analysis *Barry Carruthers - Xi Engineering Consultants Ltd, UK*	Dynamic Maintenance Strategy Optimisation tool *Idoia Iceta - NEM SOLUTIONS, ES*
12:40	Modelling and Control of the Wavestar Prototype *Rico Hansen - Wavestar, Aalborg University, DK*	The Sensitivity of Actuator-Disc RANS Simulations to Turbulence Length Scale Assumptions *Tom Blackmore - University of Southampton, UK*	Deployment and Testing of Commercial Scale CETO Wave Energy Converter *Jonathan Fievez - Carnegie Wave, AU*
13:00	**Lunch / Exhibition**		
	EEE Theatre	**Nightingale Theatre**	**Annex Theatre H**
Session XI	**Marine energy converter deployment, operation and impacts**	**Design and optimisation of wave energy converters**	**Control of marine energy converters**
Chair	*Andy Grant - University of Strathclyde, UK*	*Tony Lewis - University College Cork, IE*	*Luis Gato - Instituto Superior Tecnico, PT*
14:00	Consideration of the Condition Based Maintenance of Marine Tidal Turbines *Paul Prickett - Cardiff University, UK*	The Effect of Wave Climate on the Optimization of the Shape of a Wave Energy Collector by Genetic Algorithm *Andrew McCabe - Lancaster University, UK*	An Independent Validation of the Optimality of Latching and De-clutching Control by Evolutionary Methods *Kester Gunn - Lancaster University, UK*
14:20	A Comparison of Underwater Noise at Two High Energy Tidal Stream Sites *Merin Broudic - Swansea University, UK*	Design of a Floating Oscillating Water Column for Wave Energy Conversion Rui Gomes - IDMEC, Instituto Superior Tecnico, PT	Implementation of Pitch Stability Control for a Wave Energy Converter *Carlos Villegas - Wavebob Ltd, IE*
14:40	Experiences from Field Testing with the BOLT Wave Energy Converter *Ida Kathrine Bjerke - Fred. Olsen, NO*	Performance of a Wave Energy Converter with Mechanical Energy Smoothing *Andreas Josefsson - BTH, SE*	A Model for the Sensitivity of Non-Causal Control of Wave Energy Converters to Wave Excitation Force Prediction Errors *Francesco Fusco - National University of Ireland Maynooth, IE*
15:00	The Impact of a Wave Farm in Southwestern England on Large Scale Sediment Transport *Raul Gonzalez - University of Plymouth, UK*	On the maximum and actual capture width ratio of wave energy converters *Aurelien Babarit - Ecole Centrale de Nantes, FR*	Evaluation of Maximum Power Point Tracking Methods in Hydrokinetic Energy Conversion Systems *Jahangir Khan - Powertech Labs Inc, CA*
15:20	Islay Tidal Demonstration Array - The Development Process and Fishing Issues *Alan Mortimer - ScottishPower Renewables, UK*	An Innovative Way of Utilizing Wave Energy to Counteract Eutrophication and Hypoxia *Lucia Margheritini - Aalborg University, DK*	Study of a linear generator control used for inertial point absorbers *Marcos Lafoz - CIEMAT, ES*
15:40	Obtaining tidal and wave measurements in the Inner sound of the Pentland Firth: Deployment and operational issues pertaining to the accurate quantification of flow properties *Robin Newman - Emu Ltd, UK*	Optimization of the dimensions of a gravity-based wave energy converter foundation based on the heave and surge forces *Wei Li - Uppsala University, SE*	A Geometrical Interpretation of Force and Position Constraints in the Optimal Control of Wave Energy Devices *Giorgio Bacelli - National University of Ireland Maynooth, IE*
16:00	**Refreshments /Exhibition**		
16:30-18:00	**Symposium: Marine Parks** **EEE Theatre**, see p.3 for details		
18:00	**Curry Evening** **Staff Social Centre**		

Friday 9 September

	EEE Theatre
09:00	**Closing Ceremony:** Conference Summary Best Poster/Presentation Awards Future Conferences Closing Remarks
10:40- 11:20	**Refreshments**

Poster Presentations

Poster Session I - Tuesday 16:00-17:00	
Impact of Tidal Energy Converter (TEC) Array Operation on Sediment Dynamics *Simon Neill - Bangor University, UK*	Techno-Economic analysis of tidal turbine installation and access *Stuart Easton - IMarEst, UK*
Numerical Investigation into Hydrodynamics of Moored Floating Wave Energy Converters *Wanan Sheng - University College Cork, IE*	A Numerical Investigation into the Tuning of an Oscillating Water Column *Tracy Somerville - University of Plymouth, UK*
Energy extractors in turbulent flow: wake decay and implications for farm layout *Christian Jonsson - University College London, UK*	Sensors and Measurements inside the Second and Third Wave Energy Converter at the Lysekil Research Site *Olle Svensson - Uppsala University Division for Electricity, SE*
Laboratory Testing of a Novel Float-Type Sea Wave Enegy Converter Using a Smart Wave Generator *Ahmed El-Baz - Ain Shams University, EG*	Computational Modelling of the OWEL Wave Energy Converter *Mark Leybourne - University of Southampton/IT Power Ltd, UK*
Design of an experiment for field testing of the interactions between 1:10 scale horizontal axis tidal turbines in Strangford Lough, Northern Ireland *Laura Finlay - University of Edinburgh, UK*	Analysis of biological safety of orthogonal turbine *Ekaterina Sultanova - JSC NIIES RusHydro, RU*
An Investigation into the Possible Effects of Cavitation on an Horizontal Axis Tidal Turbine *Paul Prickett - Cardiff University, UK*	Grid Compliance of Ocean Energy Converters: Control Strategies and Recommendations *Anne Blavette - University College Cork, IE*
Wave energy, a complement to the insular energetic systems. *Isidro Padron - University of La Laguna, ES*	Flexible Vane Turbine Tidal Current Energy Conversion Device - From Concept to Application *Peng Yuan - Ocean University of China, CN*
Numerical simulation of a wave energy conversion system *Johannes Van Niekerk - Stellenbosch University, ZA*	Cost analysis of electric drive trains for tidal turbine farms *Sigurd Ovrebo - SmartMotor, NO*
Identifying the Frontier of Knowledge for Marine Renewable Energy Research *Mathew Topper - University of Edinburgh, UK*	Experimental Research on Tidal Current Power Station *Fengmei Jing - Harbin Engineering University, CN*
Numerical and Analytical Simulations of Wave Interference about a Single Row Array of Wave Energy Converters *Kieran Monk - Plymouth University, UK*	
Poster Session II - Wednesday 16:00-17:00	
Diversification opportunities for businesses in the South West of England to engage with the growing Marine Renewable Energy market through supporting the wave energy industry. *Amanda Pound - The University of Exeter, UK*	Coordinators Overview of the FP7 CORES Project *Raymond Alcorn, University College Cork, IE*
Numerical and Experimental Investigation of a Novel Breakwater Combining Coastal Defence and Energy Generation for Near Shore Environment *Ming Li - The University of Liverpool, UK*	Flow Sensitivity to MHK Energy Generation from Currents Using the SNL -EFDC Model *Scott James - Sandia National Laboratories, UK*
Study of Coherent Structures Suitable for Numerical Testing of Tidal Current Energy Devices *Oghenevwori Okorie - Robert Gordon University, Aberdeen, UK*	Characterization of the tidal current resource and main constraints in Gibraltar Straits *Pedro Mayorga - EnerOcean S.L., ES*
Model study of the oceanography of the Pentland Firth and adjacent waters. *Peter Bowyer - ERI, Thurso, UK*	Wave power plant with air orthogonal turbine *Viacheslav Sobolev - JSC NIIES RusHydro, RU*
Continued on next page	

Optimisation of Multiple Turbine Arrays in a Channel with Tidally Reversing Flow by Numerical Modelling with Adaptive Mesh *Tim Divett - University of Otago and National Institute of Water and Atmospheric Research, NZ*	Uncertainty in wave power from a wave model *Ben Timmermans - National Oceanography Centre, UK*
Tidal Turbine Wakes: Small Scale Experimental and Initial Computational Modelling *Stephanie Ordonez-Sanchez - University of Strathclyde, UK*	The Potential of Tidal Power from the Doragh Estuary *Masoud Sadrinasab - Khorramshahr University of Marine Science and Technology, IR*
All-Electric Wave Energy Power Take Off Generator Optimized by High Overspeed *Jonas Sjolte - Fred Olsen, NO*	Paddle-Wheel Turbines for Tidal and Wave Energy Installed on Stable - Unsinkable Floating Platform Based on Articulated Joints Truss Technology *Themistoklis Andrikopoulos - ATIO GROUP, GR*
Assessment of Arrays of In-stream Tidal Turbines in the Bay of Fundy *Richard Karsten - Acadia University, CA*	A Brief Introduction to the BOLT-2-WaveHub Project *Even Hjetland - Fred. Olsen Wave Energy Project, NO*
The SOWFIA Project: Streamlining of Ocean Wave Farms Impact Assessment *Deborah Greaves - University of Plymouth, UK*	Design of a Turbine-Generator joint for an oscillating water column *Bruno Pereiras - University of Valladolid, ES*
Early Design Stage of a Floating OWC Off-shore Wave Energy Prototype and Mooring Hinges *Joaquim Barbosa - ISEL - Polytechnic Institute of Lisbon, PT*	Tidal Stream Turbines and Sediment Dynamics: An Overview of Archetypal Factors *Stephen Haynes - University of Southampton, UK*

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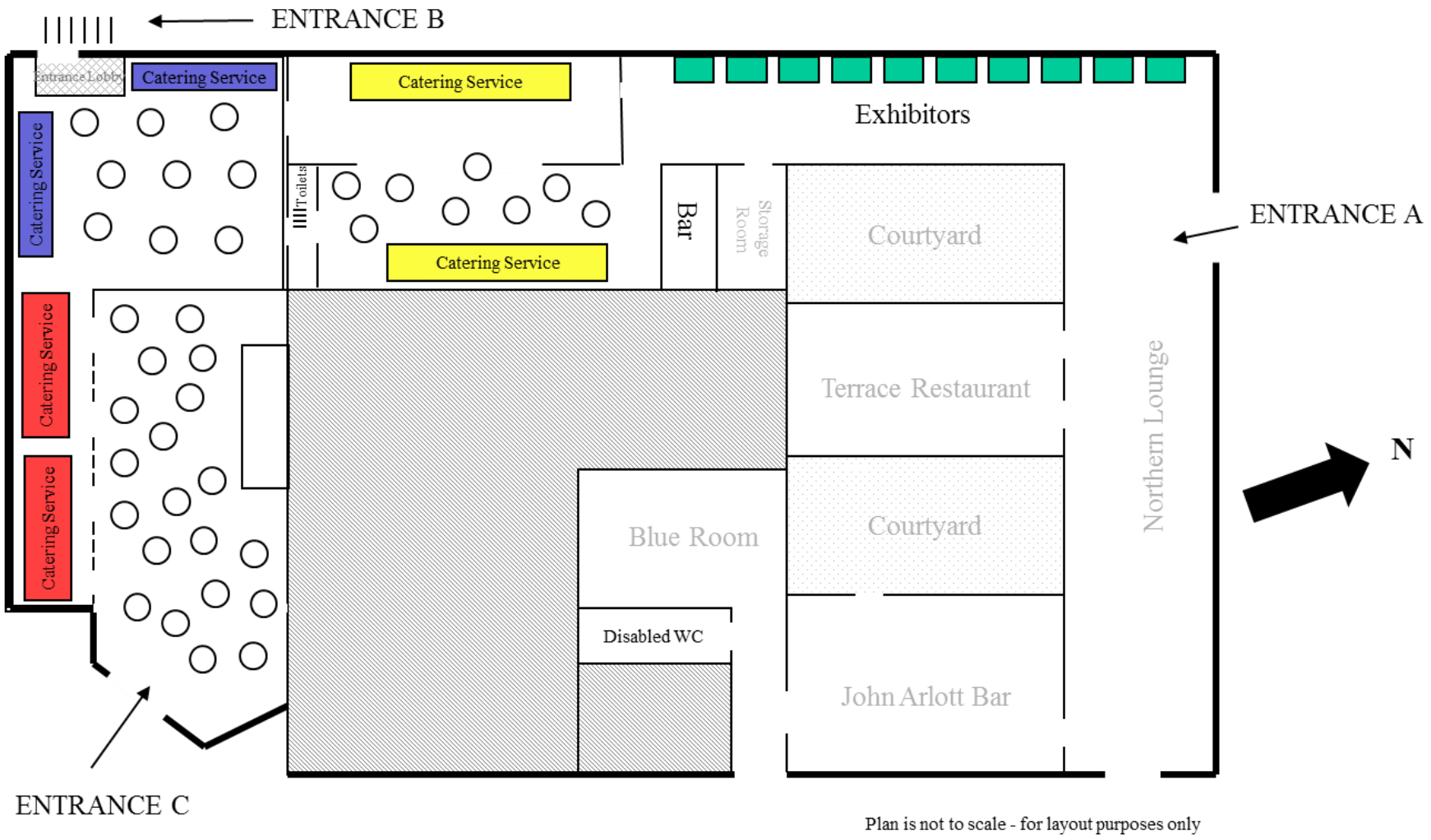
Notes



Plan is not to scale - for layout purposes only

Staff Social Centre Floor Plan


European Wave and Tidal Energy Conference
Annex :
Theatre H - Oral Presentations,
Foyer - Poster Presentations
Theatre J - Additional Programmes
Nuffield :
Lecture Theatre A
EEE :
Main Theatre - Oral Presentations
Staff Social Centre :
Receptions, Lunch, Refreshments, Exhibition
Nightingale :
Theatre - Oral Presentations
Life Sciences :
Registration, Presentation Upload, IT Facilities
Glen Eyre Reception Halls of Residence Accommodation Check-In, Check-Out
Hartley Grove Block A Halls of Residence Accommodation
Interchange :
Banquet Bus Departure Point
Hampton Car Park :
Conference Car Park (Permit Required)
A33
NO ENTRY
Way Out
GLEN EYRE DRIVE
BEECHMOUNT ROAD
GLEN EYRE ROAD
Way In
Glen Eyre Complex
Glen Eyre Reception
BASSETT AVENUE
CHETWYND ROAD
COPPERFIELD ROAD
VIOLET ROAD
Hartley Grove Block A
GLEN EYRE ROAD
HONEYSUCKLE ROAD
BASSETT CRESCENT EAST
OAKLANDS WAY
Boldrewood Campus (under redevelopment)
BURGESS ROAD
A35
Highfield Campus
SALISBURY ROAD
UNIVERSITY ROAD
BROADLANDS ROAD
HARTLEY AVENUE
CHAMBERLAIN ROAD
HAWTHORN ROAD
THE AVENUE
HIGHFIELD AVENUE
SOUTHAMPTON COMMON
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100 metres
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