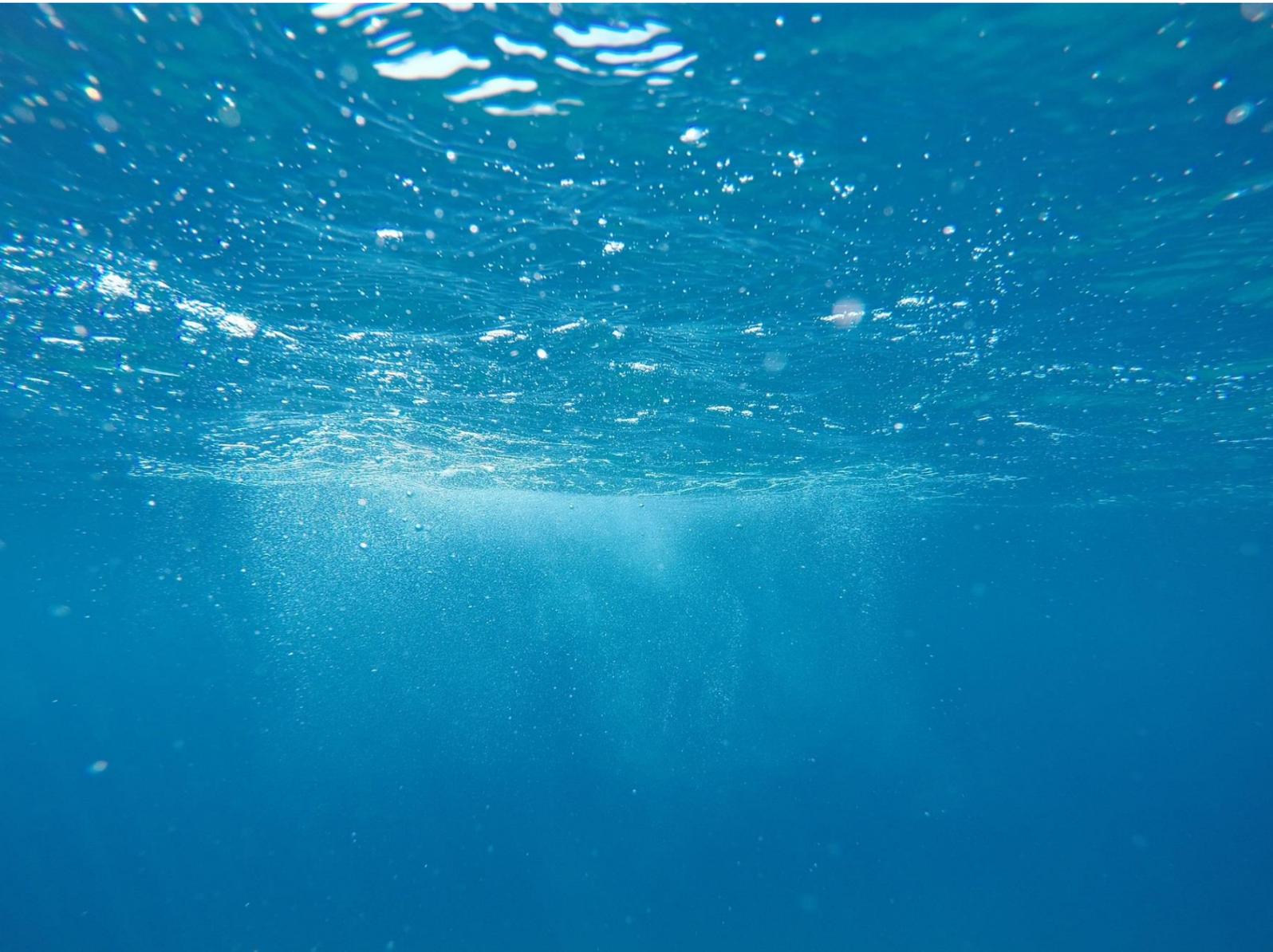


Mastermining™ – Wave and Tidal Workshop

16th May 2018

Aberdeen



08:30 Registration

08:50 Welcome, Introductions and Format of the Day



Tony Laing
*Director –
Research and
Market
Acceleration
NSRI*

Tony Laing, NSRI

Tony has a career in the Oil and Gas energy sector, spanning over 35 years, with roles in E & P Operators, multinationals, technology suppliers and niche consultancies; in addition to supporting academia. Over the last 20 years, this has been at senior business and technical leadership level, with many technology and commercial industry firsts, across the E & P production life cycle from field developments to late life and decommissioning. These roles have been both in the UK and overseas, with assignments in Norway, Africa, China and India.

Tony is a strong believer in technology enabling, driving business and economic growth; NSRI can play a key role within the wider subsea sector assisting from inception to realisation in the market proposition.

09:00 Opening Address

David Rennie, Scottish Enterprise



David Rennie
*International
Sector Head
Scottish
Enterprise*

David Rennie is director of Oil and Gas, Thermal Generation and CCS for Scottish Enterprise, the economic development agency for Scotland. His main focus is upon leading overall SE activity in these sectors. In terms of Oil and Gas, this means close working with our Industry Leadership Group and colleagues to deliver the Scottish industry-led Oil and Gas Strategy which was launched in May 2012. Our focus is on increased focus and resources in areas such as innovation support, internationalization and supply chain growth. In terms of CCS and thermal generation, we are undertaking some work on the economic opportunities around Shale Gas as well as looking to develop a cluster hub approach for the Central North Sea to help stimulate the market for CCS. David has been with SE since 2010 and prior to that worked as an Economist for Government and the private sector.

09:15 ONE Project Overview

Anchoring the Supply Chain - Diversification

Colin McHardy, Opportunity North East



Colin McHardy
Diversification
Manager (Oil, Gas &
Energy)
**Opportunity North
East**

Anchoring the oil, gas and energy supply chain in North East Scotland is a regional economic priority. Private sector economic development company Opportunity North East (ONE) and Scottish Enterprise have jointly developed a new support programme for SMEs, which aims to connect companies with market diversification opportunities and key customers in these sectors. This presentation will provide further detail on the programme and how to get involved.

Colin McHardy has worked in the oil and gas industry for more than 25 years in operational, commercial and executive management roles in the global subsea construction and engineering sectors. His experience includes roles with SMEs through to major corporates, involving business growth, change management, internationalisation and restructuring. He joined Opportunity North East (ONE) in 2017 to work on its Oil, Gas & Energy diversification programme, which is a partnership project with Scottish Enterprise.

09:30 The Opportunity – Setting the Scene

The Funding Landscape for Demonstration Projects

Mark Georgeson, Scottish Enterprise



Mark Georgeson
Energy Specialist
Scottish Enterprise

Considerations for putting together a business case for a research and development demonstration project and potential grant funding options of the project.

Mark has 20 years experience in senior management positions in the private and public sectors covering a range of sectors including renewables and oil and gas. In his time in HIE and Scottish Enterprise he has worked with companies across a wide range of sectors to innovate and drive growth. For the past 3 years, Mark has been focused on working with businesses and organisations to access research and development funding to deliver low carbon demonstration projects.



Simon Cheeseman
Wave & Tidal
Sector Specialist
ORE Catapult

09:40 Overview of Subsea Technological Challenges in Wave & Tidal Energy

Wave & Tidal Challenges & Opportunities

Simon Cheeseman, ORE Catapult

The presentation will provide an overview of role of ORE Catapult, identify how W&T innovation challenges and discuss opportunities for the transfer of cross sector skills and collaborative opportunities.

Simon Cheeseman is a marine engineer with 10 years' experience in marine renewables. He works for Offshore Renewable Energy Catapult, a technology innovation and research centre for offshore wind, wave and tidal energy. Simon is responsible for managing the Catapult's marine renewables strategy, identifying the wave & tidal technology innovation priorities and managing the Catapult's regional engagement programme.

Overview of Subsea Technical Challenges in Wave & Tidal

Norman Morrison, Energy Technology Partnership

Presentation of the current state of the wave and tidal sector, what are the subsea challenges and what are the key organisations that can help you.

Norman supports the marine energy sector through his work with both Energy Technology Partnership and Wave Energy Scotland. Norman's focus is on building partnerships between the research communities and industry to develop technologies and processes that will help drive innovation and cost reduction in the marine energy sector.



Norman Morrison
Marine Energy
Business
Development
Manager
**Energy Technology
Partnership**

10:00 Knowledge Transfer from Oil & Gas – Technology Strengths and

Economic Strength

Tony Laing, NSRI

Presentation overviewing the development of subsea engineering in the UK oil and gas sector outlining the key learnings and advancement achieved.



Tony Laing
Director –
Research and
Market
Acceleration
NSRI



Maria Farid
Project Engineer
NSRI

Maria Farid, NSRI

Maria is the Project Engineer at the NSRI responsible for Wave & Tidal Energy. Currently she is developing a Matchmaker database of businesses, universities and research bodies working on subsea technology development for the Wave and Tidal Energy industries.

Maria is a graduate of the University of Aberdeen with an MEng in Chemical Engineering. Recognised as the Young Chemical Engineer of the Year award in 2014 by Institute of Chemical Engineers.

After graduation Maria joined Wood Group PSN's TOTAL Project in Aberdeen as a Process Engineer and is currently on secondment to NSRI.

10:15 Panel Session – Open to Audience

10:30 Break

10:50 Electrical Power and Distribution

Rowan Boswood, Atlantis Resources

MeyGen Power Electronics and Cost Reduction

In its present state, tidal power is too expensive. To reduce costs, the design of the electrical system must be changed. This presentation explores the potential array layouts that have been considered.

Rowan Boswood is a senior structural engineer at Atlantis Resources. He works within the project team that is involved in the development of future tidal projects and the operations and maintenance of the MeyGen project.

He has previously worked in the Oil and Gas industry for both DNV GL in Aberdeen and Technip in France.



Rowan Boswood
Senior Structural
Engineer
**Atlantis Resources
Ltd**

Ian Walters, Hydro Group



Ian Walters
Engineering
Manager
Hydro Group

11:20 Materials & Corrosion

NeSSIE – Key Anti-Corrosion Solution Challenges and Prioritisation

The North Sea Solutions for Innovation in Corrosion for Energy (NeSSIE) aims to develop three offshore renewable energy demonstration projects related to corrosion issues. A roadmap indicates the priority research and development areas, based on the identified key challenges encountered with the existing anti-corrosion solutions.

Noor Van Velzen, University of Edinburgh, Policy and Innovation Group



Leonore is a Master of Science in Sustainable Energy Technology with a Bachelor in Civil Engineering at the Delft University of Technology, with internships at the Wave Energy Centre (WavEC) and the International Renewable Energy Agency (IRENA). In the Policy and Innovation Group, Leonore has been working on the ETIP Ocean project and coordinating the delivery of North Sea Solutions for Innovation in Corrosion for Energy.

Noor Van Velzen

Research Associate in Marine Energy University of Edinburgh, Policy and Innovation Group



Shona Pennock, University of Edinburgh, Policy and Innovation Group

Shona works within the Policy and Innovation Group at the University of Edinburgh. She is an alumna of the Centre for Doctoral Training in Wind Energy Systems at the University of Strathclyde. She has been carrying out research on the H2020 WaveBoost project, which is developing an innovative Power Take-Off (PTO) technology. She is also coordinating the delivery of the ETIP Ocean project and working on North Sea Solutions for Innovation in Corrosion for Energy.

Shona Pennock

Research Associate in Marine Energy University of Edinburgh, Policy and Innovation Group



Paul Benstead
*Pipeline Technical
Authority North Sea,
Angola and MENA*
BP

Oil & Gas Integrity Management Framework

Paul Benstead, BP

The presentation will outline the Integrity Management Performance Improvement Cycle process that is applied to Oil Industry focusing on critical drivers and what we would change given the current technology available.

Paul Benstead is a Charter Mechanical Engineer with 35 years of experience in the Oil and Gas industry. He has significant experience of the design, manufacture, installation and operation of subsea infrastructure. He is the Pipeline Technical Authority for North Sea and North African assets.

11:50 Foundation & Moorings

Moorings & Foundations Status & Opportunities

Richard Yemm, Quoceant



Richard Yemm
Founding Director
Quoceant

The presentation will briefly summarise the current state of the art in wave and tidal and set out the special requirements and characteristics of mooring and anchoring systems for marine energy converters. It will then provide an over view of challenges to both the development process and where opportunities exist for further innovation and for adaptation of existing technology or processes in other sectors.

With a background in the wind energy industry and then 2 decades in wave energy, Richard has made a long-standing contribution to the renewables industry in general and marine energy in particular. This included over 17 years leading the development and commercialisation of the Pelamis system. Richard then formed Quoceant with senior colleagues from Pelamis to ensure that the learning and experience was available to the sector going forwards.

Subsea Power Hub – Convert, Store, Deliver

Paul Slorach, EC-OG



Paul Slorach
*Business Development
Manager*
EC-OG

Paul Slorach will present a case study of the Subsea Power Hub which has successfully integrated learning from the Oil & Gas industry into the Wave & Tidal sector.

The Subsea Power Hub, developed by EC-OG, harnesses the energy within ocean currents to convert, store and deliver autonomous electrical power. The unit performed in line with technical predictions during an 8-month sea trial in 2017 at the European Marine Energy Centre.

With over 10 years in industry, Paul has worked with a number of first tier service contractors, independents and international operators. This diverse experience has provided Paul with significant business acumen, an in-depth understanding of the Oil & Gas industry as well as a high-level of technical expertise.

Paul joined EC-OG in November 2013 and is currently responsible for business development activities surrounding the self-contained regenerative energy source - the Subsea Power Hub.

12:20 Lunch

13:00 Installation, Inspection & Condition Monitoring



Elaine Buck
Technical Manager
EMEC

Ocean Energy Challenges in Real Sea Reliability Testing and Installations

Elaine Buck, EMEC

Marine energy generators test (wave) and now operate (tidal) in harsh environments but still need to be safely installed and perform reliably. There are long term success of survivability of tidal and now wave devices with robust mooring systems in place, however there have also been failures. Lessons learnt through marine supply chain have identified key areas of improvement as well as the continued challenges in the areas of installation, inspection and monitoring. The presentation will review the key challenges in these areas from the 31 wave and tidal devices deployed at the European Marine Energy Centre.

Elaine joined EMEC in August 2014 from the Offshore Renewable Energy Catapult. She is responsible for managing the project team, who work across EMEC to deliver wave and tidal developer testing, including enabling technology R&D projects. She provides support to the Operations and Technology Director and from her technical perspective initiates testing programs to build on EMEC's experience in real sea testing for the wave and tidal sector.



Mike Allan
*Renewables and
Asset
Management
Lead
Xodus Group*

How can Renewables Learn from O&G Asset Management?

Mike Allan, Xodus Group

While renewables can learn from oil in gas in many positive ways there are also cautionary lessons that the industry would do well to be aware of and avoid. This presentation will touch upon some of the structural problems that have evolved in oil and gas with thoughts on how to avoid some of these when starting afresh.

Mike Allan is a chartered engineer with 16 years subsea engineering experience. Mike has experience of all stages of oil & gas developments from concept to detailed design and on through operations. Lately Mike has been heading up Xodus Renewable Energy division and has been talking with many renewable developers about what their O&M plans are.



Michael Cowie
*Technical Manager,
Renewables and
Subsea Projects
Ecosse Subsea Systems*

Ecosse Subsea Systems' Diversification Story

Michael Cowie

Ecosse Subsea Systems was established in 1996 as an oil and gas service company providing engineering consultancy offering to the subsea market. With the introduction of a Personnel Department in 2008 and the design, build and commercialisation of patented subsea route preparation and trenching equipment the company diversified in 2012 to capitalise on opportunities in the offshore wind sector. Offshore renewables currently account for 90% of Ecosse's subsea operations.

Michael Cowie is a Chartered Engineer, a Fellow of the Institute of Marine Engineering, Science & Technology and is currently Technical Manager of Ecosse Subsea Systems Ltd. Michael is a Civil Engineer who diversified into the oil and gas market in 1998. Michael's current role involves the development and commercialisation of subsea technologies. Over the last 3 years Michael has been actively involved in wave and tidal energy markets and heads up the PECMAG Power Take Off project run by Wave Energy Scotland.

Aquatera International Experience

Ian Johnstone, Aquatera Energy



Ian Johnstone
Senior Consultant
Aquatera

Over the last 16 years of activity, Aquatera has established a global reputation as one of the leading consultancies in the ocean energy sectors. Aquatera is one of the most experienced marine energy environmental and technical contractors in the world; having worked on over 200 marine energy studies and a number of strategic marine energy planning projects. Aquatera's client base includes leading marine technology and project developers, utilities, agencies and governments.

Ian has 15 years' experience in a variety of renewable energy projects, from supplying waste wood for a district heating scheme to completing an MSC in Renewable Energy Development. He has also been a local Politician for 9 years; as chair of the Development and Regeneration Committee, Ian has been very closely involved in the supporting and developing marine energy in Orkney.

He has been very closely involved in the process of getting grid capacity to Orkney and other Scottish islands chairing the Orkney grid group and taking the Islands case to three consecutive Energy ministers.

Having trained in Agriculture, Ian returned to Orkney in 1990 to work for the Department of Agriculture. In his desire to stay in Orkney he bought into a local coal business and took on the management of the recently formed Machinery Ring which is an agricultural cooperative that incorporates a labour agency. He was then elected to the Orkney Islands Council in 2003. He joined Aquatera in 2012 since then he has been actively involved in a range of projects. Aspart of the management team he covers supports the devleopment of Aquatera and its staff and has a particular focus on developing the Japanese market.

13:55 Overview of Challenge Sessions

14:00 Session 1

14:40 Session 2

15:20 Break and Networking Session

15:40 Session 3

16:20 Straw-poll Voting

16:30 Experts Feedback

16:50 Closing Remarks

17:00 Close