Welcome

Networking Event

7th September 2016
Subsea Industry Sectors

- Oil & Gas
- Defence
- Wave and Tidal
- Ocean Science
- Mining
- Offshore Wind

www.subseauk.com
Subsea UK Profile

• Founded in 2004; industry partnership with government
• Self sustaining privately funded trade body
• Champions for the UK Subsea supply chain through:
  – Supporting Business Development
  – Innovation & Technology
  – Skills & Future Talent
  – Diversification
  – Exports & International Business
Subsea UK Membership Profile

Over 300 members

• Operators
• Main contractors
• Engineering houses
• Manufacturers
• Sub suppliers
• Component suppliers
• Academia
• Support services
UK Regional Groups

• Regional Group representation
• Regular meetings or Networking Events
• Business contacts and introductions
• Local issues
• Connection to Subsea UK board
• South East, South West, North East, North West
Subsea UK Website and Magazine

Main communication tools attracting up to 20,000 unique visitors monthly.

- Online Industry News HUB
- Subsea Member Company Directory
- Events, exhibitions, conferences
- Resource Archive
- Subsea UK Magazine (3000 printed and e-version dist. 15,000+)
- SubseaIntel - Market Intelligence

www.subseauk.com
• Focal point for Research and Development for the UK Subsea Industry

• To enhance the UK’s position as the leading technology provider for the subsea industry

• Technology Arm of Subsea UK
17:00 Registration and Networking
17:30 Welcome by Subsea UK
17:35 PMI Analytical
17:50 Bender UK
18:05 WITTENSTEIN
18:20 FEDF Supply Chain Growth Programme
18:35 James Fisher Marine Services
18:55 Maytree Engineering Services
19:05 General Introduction
19:30 Supper and Networking
20:30 Close
Heat Treatment technician – Caterpillar, Glasgow

Foundry Technician – Blantyre Castings (carbon Steels, Manganese and Stainless Steel production) OES

Quality Controller / Lab manager – James Reid metals, Glasgow (Gun Metal, Phos Bronze, Al Bronze, Monel, Brasses) OES- XRF

Sales Engineer – Buehler, Metprep, Bodycote (Exova)

Tech Sales Director PMI Analytical – OES, Mobile OES and Hand Held XRF

UK Distributer for Bruker AXS instruments
Hand Held XRF – Non Destructive Test
Mobile OES
Laboratory OES
Positive Material Identification (PMI)

- Raw material verification (316 – 304 – Inco 625 – Duplex – Monel)
- Supplier components and services (weld overlay)
- Failure investigation
- Weld consumable selection
- Pre and post production material traceability
Industry applications

- Pump and valve manufactures
- Welding and fabrication
- Heat treatment facilities
- Test laboratories
- Engineered components
- NDT companies
The Power in Electrical Safety

Phil Robinson – Business Manager  phil.robinson@bender-uk.com
Mumtaz Farooqi – Technical Manager  mumtaz.farooqi@bender-uk.com

SHELL – ‘cost of repair is insignificant to the cost of lost production’
Successful pioneer with the power of the Market Leader

- We develop electrical safety solutions for complex applications.
- Our market leading products protect men and machines and avoid downtimes.
- Global reach - family owned – OEM – Est. over 70 years

Innovative Solutions that identify risks before they occur.
Off shore specific solutions

Oil rigs and floating production systems

- Prevent platform shut down caused by electric faults.
- Protect personal via Residual current monitoring.
- Central relay to control point.
- Goal to locate insulation faults & enable the platform to control electrical safety.

A Floating Production Storage and Offloading Unit (FPSO)

- Range of on-board solutions to ensure optimum productivity.
- Goal to ensure resilience of all connections and prevent costly unplanned outage.
- Predictive analysis and maintenance planning.

Underwater systems

A safe power supply, even underwater

- OEM and partnership approach to develop sub sea distribution insulation monitoring.
- Goal to detect insulation problems before failure & prevent costly emergency repairs.
Market Overview a Total Capability

Electrical Safety - Onshore, Offshore, Subsea

- ISO685: Insulation Monitoring for unearthened systems
  - AC 230-400 V, AC 690 V, DC 1000 V

- EDS960: Online Fault Location

- PEM575: Power Quality & Energy Management

- IR1575: FPSO Insulation Monitoring & Fault Location
  - Fire and gas systems
  - Process control systems
  - Platform shutdown systems

OEM Solutions: Subsea / Offshore / Distributed Insulation Monitoring
Reach further into the sub sea…. On all aspects of the electrical infrastructure.

Provide real time data

**SHELL** – ‘cost of repair is insignificant to the cost of lost production - we need accurate information to plan’
Next Steps

One to one meetings / collaborations / technologic challenges

Phil Robinson – Business Manager phil.robinson@bender-uk.com

Mumtaz Farooqi – Technical Manager mumtaz.farooqi@bender-uk.com


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WITTENSTEIN – being **one** with the future

More intelligent  
More efficient  
More secure
Mechatronic Solutions – from the Sea Bed to Aerospace
Milestones in the Company's Development

- **1949**: DEWITTA Spezialmaschinenfabrik established
- **1979**: Manfred Wittenstein takes over DEWITTA
- **1983**: First low-backlash planetary gearhead
- **1989**: Start of international expansion
- **1992**: Portfolio extended with electromechanical products
- **1996**: Company relocates to Harthausen
- **2001**: WITTENSTEIN AG established
- **2008**: WITTENSTEIN talent arena opens
- **2011**: "Urban Production" officially opened in Fellbach
- **2014**: Completion of the Harthausen Innovation Factory

Originator Mark Perry

Proprietary
Mechanical & Mechatronic Drive Solutions

WITTENSTEIN alpha

WITTENSTEIN electronics

WITTENSTEIN bastian

WITTENSTEIN cyber motor

WITTENSTEIN intens

WITTENSTEIN motion control

WITTENSTEIN aerospace & simulation

attocube systems
FITBONE® – Motorized Intramedullary Distraction Nail

The world's only fully implantable, active, programmable intramedullary nail for lengthening extremities

- Used, amongst other things, to correct leg length inequalities or bone defects
- Average distraction per day: 1 mm
- Maximum extension: 60 mm in the tibia (lower leg) or 80 mm in the femur (thigh)

Benefits

- High product safety
- Minimal risk of infection
- Reduced pain
- High wearing and treatment comfort
- Less scarring
- Short hospitalization periods

Corporate

Originator Mark Perry

Proprietary
Servo System

A380 Door

Actuators for the Doors and Slides Management System (DSMS) of the A380

- Criticality: A
- Max. Torque (SWA): 804 Nm
- Redundant motor winding
Awe inspiring: The world record-breaking electric go-kart accelerates from 0 to 60 mph (approx. 100 km/h) in just 2.635 seconds.

**VW E-UP!**
Dual rear axle drive with helical toothed gearhead
Traction voltage 400 V
\[ P_{\text{max}} = 2 \times 104 \text{ kW at the rear axle} \]
\[ M_{\text{max}} = 2 \times 600 \text{ Nm} \]
\[ n_{\text{max}} = 12,000 \text{ rpm} \]

**Mercedes Benz SLS AMG** has an output of 123 kW and is incorporated in a revolutionary, high performance gearbox with an integral hybrid drive.
Key Drivers for Electric Actuation

Subsea Market

- Environmental risk
- Deeper waters
- Longer step-outs

- Increased Oil Recovery on existing fields with Processing & Compression

- Increase reliability to Reduce marginal field expenditure

Originator Mark Perry

Proprietary
SSEAC® Subsea Electrical Valve Actuator

Safety – Reliability - Competence

Modular
Electrical
Redundant
Family of Drop in actuators SSEAC®
3000 m operation    Life 25 years    MTBF 253,000 hours

• Low cost drop in actuators – 24VDC 2 Amp

• Dual Channel high availability

• Drop in actuators with zero flying leads
Main benefits of electric actuation

- Longer step-outs
  Ultra Deep

- Condition Monitoring

- Usability

- Safety

- Controllability

- Reliability

Suitable for SIL 3
Safety Integrity Level
IEC 61508

Originator Mark Perry

Proprietary
SUBSEA ELECTRIC ACTUATION

Increased Functionality:
Operational Efficiency:
Environmental Safety:

OPEX:
No hydraulic fluids and maintenance of it.

RELIABILITY:
Facilitates condition monitoring

CAPEX:
Reduces overall project costs circa 20%

ENABLING:
Longer step-outs and deeper water

OPERATIONAL EFFICIENCY:
Closer control of EOR and Production schemes

SUSTAINABILITY:
Environmentally safe - zero discharge
Global Subsea Capability
from South West Cumbria

Offshore Wind • Submarines • Oil & Gas • Defence • Nuclear • Tidal
The Supply Chain Growth Centre™ Barrow-in-Furness
Helping Companies Capture More Spend and Contracts

Come and see us at FEDF Abbey Road Offices.

FEDF Delivery Plan Priorities

Skills
Supply Chain
Infrastructure
Environment
# Key Tasks

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## Enabling Actions

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## Focused Support

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<td>Apprentice Bursaries</td>
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## Furness Subsea

**Building on 26% of Jobs in Manufacturing serving global markets**

**100 years of Subsea capability, pioneering Subsea Oil & Gas Technology for 40 years**
Global Reach

70
MULTI-NATIONAL & SME COMPANIES

Markets served by Furness-based firms.

They also supply the whole of Europe.
World-class submarines for the Royal Navy designed, developed, tested and commissioned at BAE Systems in Barrow supported by 1,000 suppliers in 444 UK towns and cities.
Siemens, Ulverston Subsea Connectors for the subsea power grid - A vision for automated subsea separation of oil and gas - 144,000ft² manufacturing, test and qualification facility.
Subsea Support to Wind Energy
The Future
Core Business & Diversification into:

Nuclear, Oil & Gas Decommissioning,
Survey & Submarine Rescue,
Ocean Science & Mining
James Fisher Marine Services Ltd

Introducing James Fisher Subsea Services
Mark Whitehead - Sales, Marketing and Business Development

www.james-fisher.com
Who we are: James Fisher Marine Services

James Fisher Marine Services is a subsidiary company of James Fisher and Sons plc and was formed in 2008 to bring together the groups wider marine capabilities to deliver an integrated solution under a single contracting entity.
Integrated Marine Solutions

James Fisher can deliver a **fully integrated marine solution** that draws on the groups' wider capabilities to provide a streamlined supply chain designed to reduce its clients' operational risk.
Diving and ROV services

James Fisher’s subsea division has over 40 years’ experience in providing diving and ROV services and equipment to the renewables, nuclear and oil and gas markets.
Cable Installation and Pull-in Operations

James Fisher has an **excellent proven track** record for the installation and shore-end cable pull-in operations including the provision cable teams, vessels, winches and pre operation surveys.
Emergency Response Teams and Medical Personnel

James Fisher can provide the provision of emergency response teams including confined space specialist that are medically trained and comply to highest of industry standards.
MeyGen Ltd Tidal Energy Array

JFMS successfully engineered and integrated an in-house project solution to deliver the cable installation at MeyGen Limited's Pentland Firth Tidal Energy Array.
Maytree Engineering Services

Supplying Engineering Design, Analysis and Support for the Offshore Oil and Gas Industry
Who are we?

- Maytree Engineering Services Limited is a UK based company
- Founded in 2014 by Gareth Black
- Maytree works with a trusted group of associates and companies to provide high-quality engineering design and analysis.

Who are our clients?

- MES supply their services to product supply companies and service companies.
- We have clients in the UK, USA and Norway.

What do we do?

- MES offer clients a full design and engineering and supply service including,
  - 2D & 3D design using Inventor & Solidworks
  - FEA (linear and non-linear)
  - Hand calculations
  - Concept creation and selection
  - Interpretation of international standards
  - Understanding of qualification processes
  - Design for manufacture
  - Market surveys
  - Full equipment supply
Examples of our work

High-pressure component design

Fully integrated hydraulic system design
Examples of our work

Subsea baskets and skids

Factory assembly equipment
Examples of our work

Site testing support

Offshore commissioning support
Large Bore Connection Systems

Hot Stab Features

- **Anti-Jamming nose** - Prevents jamming and galling of receptacle
- **Flow Outlet** - Optimal number of ports and geometry to minimise pressure loss
- **Handle Mount** - Designed to rotate around the body of the connector relieve hose torsion
- **Seals** - Range of compounds available to suit fluid media
- **Guidance** - Large chamfers and clearances to allow easy alignment

Hot Stab Design

MES are experienced in the design and qualification of subsea hot stabs and connection systems. This experience and knowledge has been built into the hot stab design offered here. A range of pressures from 1000psi to 15 000 psi can be accommodated through careful selection of materials and dimensions.

**Materials**
The materials of construction depend upon service. Our standard designs incorporate the following:
- **Body / Flange**: Super Duplex 32760
- **Stab**: Super Duplex 32760 with Xylan coating
- **Trim**: Stainless Steel 316
- **Seals**: HNBR
- **Guide Nose**: Aluminium Bronze
- **Fasteners**: A4 Class 70 Stainless Steel
- **Seats**: Range of compounds available to suit fluid media

**Testing / Documentation**
- **All products are supplied with EN 10204 3.1 certification as standard.**
- **Full pressure tests in accordance with API 6A 17D PSL 3 is supplied as standard. PSL3G can be supplied at additional cost.**
- **Full document packages are supplied with goods and include Certificate of Conformity, material certification, test results and weight reports.**
- **Single easy to use documentation package**
- **Full 3rd party witness inspection can be offered at additional cost.**

**Design Standards**
The MES Hot Stab has been designed in line with API 6A, 17D and ISO 13628-8. The unique design system that MES employ allow fully customised solutions to be engineered in exceptionally short lead times. Our design system creates all the necessary certification document automatically, so 3rd party product verification is straight forwards, even for fully customised solutions.

### Hot Stab Nominal Bore Diameter

<table>
<thead>
<tr>
<th>Nominal Bore Diameter</th>
<th>25mm [1&quot;]</th>
<th>50mm [2&quot;]</th>
<th>50mm [2&quot;]</th>
<th>75mm [3&quot;]</th>
<th>100mm [4&quot;]</th>
<th>100mm [4&quot;]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Pressure Ratio</td>
<td>690bar (10 000PSI)</td>
<td>5000bar (5 000PSI)</td>
<td>690bar (10 000PSI)</td>
<td>690bar (10 000PSI)</td>
<td>1450bar (20 000PSI)</td>
<td>690bar (10 000PSI)</td>
</tr>
<tr>
<td><strong>Dimension C</strong></td>
<td>128mm [5 in]</td>
<td>125mm [4.9 in]</td>
<td>200mm [7.9 in]</td>
<td>275mm [10.8 in]</td>
<td>210mm [8.3 in]</td>
<td>345mm [13.6 in]</td>
</tr>
<tr>
<td><strong>Dimension D</strong></td>
<td>338mm [13.3 in]</td>
<td>440mm [17.3 in]</td>
<td>470mm [18.6 in]</td>
<td>580mm [22.8 in]</td>
<td>640mm [25.2 in]</td>
<td>700mm [27.6 in]</td>
</tr>
<tr>
<td><strong>Dimension E</strong></td>
<td>185mm [7.3 in]</td>
<td>200mm [7.9 in]</td>
<td>200mm [7.9 in]</td>
<td>270mm [10.6 in]</td>
<td>315mm [12.4 in]</td>
<td>315mm [12.4 in]</td>
</tr>
</tbody>
</table>

**Female Weight in air [in water]**
- 19kg [16.7kg]
- 18.4kg [16.1kg]
- 38.7kg [33.8kg]
- 88kg [76.8kg]
- 70kg [61.3kg]
- 160kg [139.7kg]

**Male Weight in air [in water]**
- 13.5kg [11.8kg]
- 18kg [15.7kg]
- 25.7kg [22.5kg]
- 62kg [54.4kg]
- 73kg [62.2kg]
- 118kg [103.6kg]
Gareth Black  C.Eng, M.I.Mech.E, M.Eng, M.Phil

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Thank You

Image courtesy of Subsea 7

www.subseauk.com
Championing the UK Subsea Sector across the World

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