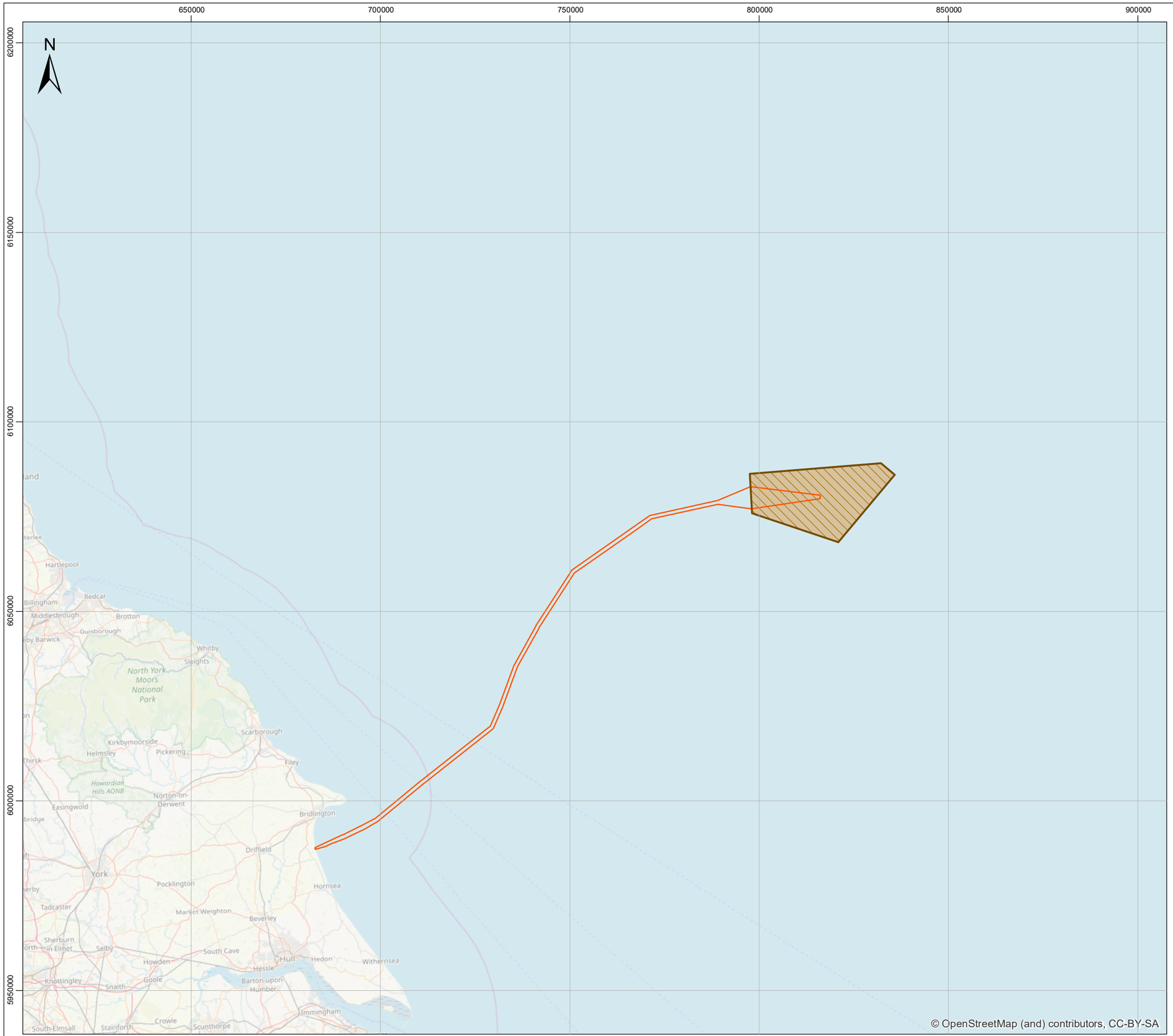

File ref: F:\DoggerBank_GIS\FormalDrawings\Marine\M_Design\DB-M-DES-0011-CreykeBeckABTeesideAAgreementForLeaseOverview\DB-M-DES-0011-01-CreykeBeckAAfLOverview-R00.mxd

Legend

- Creyke Beck A agreement for lease
- Creyke Beck A DCO
- Creyke Beck marine licence 1 boundary
- Creyke Beck marine licence 3 boundary

0 15 30 60 km

0 5 10 20 nm

Data Source:

Drawing Title

AGREEMENT FOR LEASE OVERVIEW CREYKE BECK A

Rev	Date	Remarks	Drwn	Chkd
00	14/01/2019	First issue	MM	AW

Drawing Number

DB-M-DES-0011-02

Scale	Plot Size	Datum	Projection
1:1,000,000	A3	WGS84	UTM30N

DOGGER BANK WIND FARMS BY sse equinor

Annex 4: Lessons Learnt Workshops

AREA	LESSONS LEARNT COVERED
Project Management / Overall	Experience meetings: DOWF, including specific focus on Contracts and Contract Strategy Experience meetings: BOWL General Forewind experience: Reports, Surveys, Documentation, Risk Register, etc.
Consent and Stakeholder Management	Consent Management Consent requirements in contracts Employed Renewables Consulting Group to support Consent Management
WTG (incl. Foundations)	Lessons Learned Workshop: DOWF and BOWL "Turbine Supply Agreement: page turn/review (Equinor and SSE)"
ESI/ Electrical infrastructure	Experience visit to SSE UK HVDC Centre Experience visit to Blackhillock onshore HVDC station Experience meeting: HVDC TenneT
Marine Operations	Export cable installation: DOWF, Hywind and BOWL Noise mitigation from piling: Arkona WTG installation: DOWF, Hywind and BOWL WTG Foundation installation: DOWF, Hywind and BOWL
Engineering	Experience meeting between DB and the DOWF Engineering Manager
HSE/ Quality	CDM experiences from BOWL and DOWF Incident learning: DOWF and Hywind Safety: alerts (one pagers) - distribution to the project team Quality deviations: learning from DOWF Experience reports: DOWF and Hywind
Governance/ QA/ Decision Gates	Milestone A Deliveries: Experience session

OPEN4BUSINESS HIGHLANDS AND ISLANDS

www.sseopen4business-highlands.com

A guide to the programme for Buyers and Suppliers

O4B Highlands and Islands | Powered by SSE

CONTENTS

SUPPORTING LOCAL BUSINESSES

Alistair Phillips-Davies
Chief Executive, SSE

"SSE is investing around £4 million a day in new energy infrastructure throughout the UK.

"We're committed to ensuring that real economic and social benefits flow to local businesses and communities as a result of this investment.

"We achieve this in a number of ways, but our Open4Business portal is a critical part of our approach for creating the strongest possible local supply chain. Quite simply, if local companies want a share of the money we are spending on new projects in their area, Open4Business is the best route to get it.

"But Open4Business is about more than just ensuring local companies get their share of contracts, it is about helping build skills and capabilities that ensure local businesses continue to grow and bring sustainable long-term benefits to their area.

"The Highlands and Islands was a natural place for SSE to begin this approach, given its long history in the region and the scale of new investment it is making there. The portal has already shown how effective this approach can be, and our intention is that it should grow and develop to become a strong tool that has a lasting positive impact on businesses throughout the area."

A LONG HISTORY IN THE HIGHLANDS AND ISLANDS

SSE has a long history of working in partnership with, and in, communities in the Highlands and Islands.

We want to continue that tradition and be:

- The most 'Open for Business' company in the Highlands and Islands
- Best at engaging and collaborating with the local and SME communities in the Highlands and Islands
- A valuable contributor to the Highlands and Islands economy and communities
- Working in partnership with our public sector allies and our extended supply chain to maximise community benefits and local SME opportunities

ABOUT THE OPEN4BUSINESS HIGHLANDS AND ISLANDS WEB PORTAL

SSE recognises that it has a significant role to play in contributing to the economic well-being and sustainable development of the communities it operates within. SSE is therefore committed to demonstrating exemplar levels of engagement with local suppliers. Quite simply, SSE wants to become the best in the Highlands and Islands at engaging with the local and SME communities and be the most 'Open for Business' company in the region.

To contribute to the economic well-being of the Highlands and Islands community, SSE has developed the Open4Business Highlands and Islands web portal. This site will facilitate trade and engagement between SSE and local suppliers and service providers. It will provide a platform for SSE to promote opportunities originating in the region, and will allow local suppliers to have visibility of SSE opportunities, register as a supplier and respond to notices free of charge. Users of the site can then also advertise their own opportunities such as sub-contracting work for SSE projects. They can also use the portal to advertise their own opportunities to the local supplier base.

The site also connects to other networks and supply chain initiatives in the Highlands and Islands which SSE supports such as through Energy North, Highland Council's Highland Opportunities & Business Gateway, Highlands and Island Enterprise, Chamber of Commerce and Scottish Council for Development and Industry.

HOW THE PORTAL WORKS

The Open4Business Highlands and Islands web portal allows buyers to find qualifying suppliers for a shortlist prior to entering into their standard tendering process, which happens outside the portal.

If you are a potential supplier, Open4Business Highlands and Islands enables you to respond to an opportunity by answering a simple questionnaire created by the buyer and in some cases providing a Supplier Statement. Answers to the questionnaire are scored automatically by the Open4Business Highlands and Islands portal using a scoring plan defined by the buyer.

After the response deadline for the opportunity, the buyer carries out a shortlisting process on Open4Business Highlands and Islands using the automatically calculated scores and other information from each supplier's response.

If you are successful in reaching the shortlist, the buyer will invite you to participate in their tendering process, which will usually involve submitting further details and documents outside Open4Business Highlands and Islands.

Open4Business Highlands and Islands is a dedicated web portal to facilitate productive procurement and SME relationships and opportunities

Web Portal

O4B Highlands and Islands Powered by SSE

THE BENEFITS

Facilitating economic development in the Highlands and Islands:

- Improved communications within the supplier / buyer communities
- Local and SME suppliers provided with visibility of business opportunities
- Registered local suppliers can be alerted when relevant local opportunities arise
- Leveraging the wider SSE supply chain to provide opportunities with SSE supply partners and with their supply chain partners
- Maximising local opportunities
- Local businesses and SMEs can register for free – no charges to advertise or respond to opportunities

Open4Business Highlands and Islands for Suppliers

The keys steps

- Register your organisation
- Create your Business Profile
- Business readiness and support
- Receive contract opportunities
- Respond to opportunities

For Suppliers

O4B Highlands and Islands | Powered by SSE

REGISTER YOUR ORGANISATION

Registration is easy and FREE. Visit the Open4Business Highlands and Islands web portal at http://www.sseopen4business-highlands.com.

Username

Your email address will be your username. This will be required each time you log into Open4Business Highlands and Islands.

Password

Choose a memorable password.

Organisation details

Use a business name that you use in the course of your normal business activities. Enter the correspondence address for your business. If you are a UK business your postcode will be used to connect you with your region and local business support agency. The postcode is also used when matching opportunities where the buyer has selected Regional Alerts. You must use a valid geographic postcode, not a PO Box.

Site Terms and Conditions

Confirm your acceptance of the site Terms and Conditions by 'ticking the box'.

Business Profile

To get the most from Open4Business Highlands and Islands you should complete and publish the remainder of your Business Profile.

CREATE YOUR BUSINESS PROFILE

What is a Business Profile?

Your Open4Business Highlands and Islands Business Profile, once it is published, is used to match your organisation's capabilities with opportunities. Completing your profile typically takes around 30 minutes. To get started access 'My Account' – Business Profile in the left-hand navigation menu. Once you have done so you must publish your profile to be matched with opportunities.

The Business Profile includes tabbed pages holding the following information about your organisation:

- General business information
- Insurances and policies
- Financial details
- Ownership diversity and employee diversity information
- Marketing information

Only some of your profile information is visible to other users of the service. This includes the name of your business, contact details, marketing information, website and Business Categories. To see your profile as others see it, use the 'Supplier Search' function to find your business.

Your diversity information is not available to any users and is only used by Open4Business Highlands and Islands for statistical reporting.

CREATE YOUR BUSINESS PROFILE continued...

Open4Business Highlands and Islands uses predefined CPV (Common Procurement Vocabulary) codes to match your business with opportunities. CPV codes have been developed by the European Union specifically for public procurement. Their main purpose is to help procurement personnel to classify their contract notices consistently and correctly and to help suppliers find the notices which are of interest to them by using a standardised vocabulary.

Your Business Profile will be automatically matched to posted opportunities based on your CPV code choices. You may still search for and respond to opportunities that you are not automatically matched to.

What happens next?

Use the Open4Business Highlands and Islands portal to:

- View contracts that have been automatically matched to your business
- Find additional opportunities using the easy-to-use search tool
- Search for potential partners and partnership opportunities
- View and manage opportunities that you have responded to

BUSINESS READINESS

When you submit your Business Profile for publication on Open4Business Highlands and Islands, a simple test is automatically run to see if your business meets a minimum standard. This minimum standard has been set by SSE for suppliers wishing to conduct business with SSE and the SSE supply chain.

What happens if I don't meet these criteria?

Don't worry, should you not meet the minimum requirements of the 'business readiness criteria', and you are based within the Highlands and Islands, you will be introduced to a local business support agency who can offer assistance to enable you to achieve the required standard of business readiness.

By becoming 'business ready' and publishing your Open4Business Highlands and Islands Business Profile, you'll benefit by:

- Being visible to a wide array of businesses searching for your products and services
- Demonstrating to potential buyers that your business has met the SSE Highlands 'business readiness criteria'

Until your organisation is 'business ready', your Business Profile will be 'hidden' and will not be visible to businesses searching for your products and services.

FINDING CONTRACT OPPORTUNITIES

Buying organisations use Open4Business Highlands and Islands to compile pre-tender shortlists of potential suppliers. They publish opportunities which describe the goods, services or works that they wish to procure.

They can choose one of three publication methods which determines which suppliers are matched, how suppliers should respond and how they are shortlisted:

- The 'Contract Opportunity'
- The 'Notice Only' Opportunity
- The 'Request for Quote'

Each of these is explained below.

What is a 'Contract Opportunity'?

This is the most commonly used method of publication, and allows the buyer to use the full power of Open4Business Highlands and Islands to create pre-tender shortlists of potential suppliers on the site.

When creating the opportunity, the buyer designs an online questionnaire to be completed by any interested suppliers. When published, Contract Opportunities are matched to all suppliers who meet the buyer's opportunity-matching criteria such as the Business Categories. Interested suppliers respond to a Contract Opportunity by completing the questionnaire on Open4Business Highlands and Islands. As a supplier your qualification for the shortlist depends on your answers to the questions and the weighting that the buyer applies to the answers.

The rest of the procurement process happens outside Open4Business Highlands and Islands. Finally, once a contract is awarded the buyer posts the award details on Open4Business Highlands and Islands.

What is a 'Notice Only' Opportunity?

The 'Notice Only' method of publication is used to inform the market that a procurement is taking place that will use a system or service that is external to Open4Business Highlands and Islands. This may be used, for example, by a public sector partner for procurements governed by European Procurement Directives that are required to be advertised in the Official Journal of the European Union (OJEU). The 'Notice Only' method can also be used where a private sector organisation has an existing system or service that it needs to use for a particular procurement being made.

When published on Open4Business Highlands and Islands, Notice Only Opportunities are matched to all suppliers who meet the buyer's opportunity-matching criteria. Interested suppliers respond not via Open4Business Highlands and Islands but via the buyer's own procurement website or some other process, according to the buyer's instructions on the opportunity description. The shortlisting and tendering process happens outside Open4Business Highlands and Islands, but once a contract is awarded the buyer posts the award details on Open4Business Highlands and Islands.

What is a 'Request for Quote'?

The Request for Quote method of publication is typically used for lower-value contract opportunities. Instead of being matched to all suppliers who meet the buyer's opportunity-matching criteria, a Request for Quote Opportunity is matched to an invited list of Open4Business Highlands and Islands suppliers. The invited suppliers respond as instructed by the buyer.

Every opportunity can have a series of questions that suppliers need to answer to be considered for the shortlist. As a supplier your qualification for the shortlist is dependent upon your answers to the questions and the scoring and weighting that the buyer applies to the answers.

FINDING CONTRACT OPPORTUNITIES
continued...

How do I search for opportunities?
Search for opportunities by clicking 'Opportunity Search' on the left hand top level menu or in the Supplier Activity Centre. This will take you to the Simple Search page.

Simple Search
Enter a 'keyword' in the first box. If you are looking for opportunities you can respond to, select Status='Open' in the dropdown box. To list all Open Opportunities leave the top text box empty. Click the 'Search' button.

When you have the search results you can click the 'Opportunity Name' to display the Opportunity Details page.

Advanced Search
To make a more specific search select the 'Advanced Search' tab. You can compile a set of criteria on this page. Once you have selected your search criteria, click the 'Search' button.

You can save the search criteria for future use by clicking the 'Save Search Criteria' button. You will be prompted for a name for your search. You can then re-run the search at any time by clicking on the 'My Saved Searches' link in the Supplier Activity Centre. When you run a saved search you will always get the latest information. You may find it useful to save several searches appropriate to different products and services that your business offers.

Email Alert service
You will be alerted by email to any new contract opportunities that match your unique organisation profile.

RESPONDING TO OPPORTUNITIES

There are up to four steps in responding to a Contract Opportunity:

Step 1 – Essential Questions

These are questions that the buyer has identified as essential criteria, i.e. criteria that must be satisfied by a supplier to qualify for this opportunity.

Step 2 – Other Questions

These are further questions that will contribute to your score.

Step 3 – Supplier Statement

You may be asked for a Supplier Statement. This takes the form of a question to which you are asked to provide a free-text narrative answer. This means you can provide specific narrative information about your capabilities and/or approach that the buyer considers relevant to the opportunity. Your statement can be viewed by the buyer when reviewing the scores and creating the shortlist.

IMPORTANT: To preserve anonymity of responses, your Supplier Statement must not contain any names or other information that would reveal the identity of your organisation.

Step 4 – Submit

Check that you are happy with all your answers. You can save answers and wait until you are ready to submit, but make sure that you do not miss the response deadline. Click the 'Submit' button, then make sure that you select 'Submit Now' on the Confirmation page. You will not be contacted until after the response deadline and the buyer has carried out the shortlisting process.

FREQUENTLY ASKED QUESTIONS

What type of business can register?
Any business can register as a potential supplier on Open4Business Highlands and Islands. SSE's supply chain will consist of a wide and diverse range of contract opportunities.

For example, from bed and breakfast bookings to large scale earthworks and civil engineering contracts

What happens to the information I provide to complete my Business Profile?
The information you provide is not passed on to anyone without your approval. It is only provided to a buyer when you apply for a specific contract opportunity and give them permission to use the information to evaluate your application.

Is there a minimum requirement for businesses to apply for contracts listed on Open4Business Highlands and Islands?
Yes, a minimum standard has been set by SSE for potential suppliers wishing to conduct business with the SSE supply chain.

What happens if I don't meet these criteria?
Don't worry, businesses that don't meet the agreed criteria will be introduced to a local business support agency who can offer assistance.

What if I can't answer a question?
Open4Business Highlands and Islands allows you to save your progress at any stage of the registration process, so you can take time finding the information.

Can I go back and change my answers?
Yes, you can change any information that makes up your Business Profile at any time and as many times as you like.

Can multiple users from the same business register?
Businesses can have as many registered users as they like. New users must be invited or approved by an existing user.

What help is available for suppliers?

User Guide – There is a detailed User Guide available on the web portal.

Frequently Asked Questions – A full list of Frequently Asked Questions and answers is provided on the web portal.

Email – For support on Open4Business Highlands and Islands please contact the SSE Support Team email:
sse.open4business.highland@sse.com

Open4Business Highlands and Islands maximises local benefits from SSE's activities, as well as from those of SSE supply chain partners

For Buyers

O4B Highlands and Islands | Powered by SSE

OPEN4BUSINESS HIGHLANDS AND ISLANDS FOR BUYERS

Getting started

Open4Business Highlands and Islands is an innovative new web portal that will enable SSE and businesses in the SSE supply chain to access suppliers in the Highlands and Islands. It has been introduced to augment existing procurement and buying processes. It will enable you as a buyer to easily post contract opportunities, identify and engage with local suppliers.

Both SSE and businesses in the SSE supply chain can post contract opportunities. If you are a company in the SSE supply chain and you wish to post contract opportunities you will need to create an Open4Business Highlands and Islands user account and register some basic details:

- Visit the Open4Business Highlands and Islands web portal http://www.sseopen4business-highlands.com and click on the 'Register' link.
- You will be asked to set up a username and password, and to provide some general information about your organisation.
- You will also be asked to accept the Open4Business Highlands and Islands terms and conditions.
- You will be asked to provide further information about your organisation in the Business Profile section.
- If your organisation is already registered with Open4Business Highlands and Islands you don't need to create a new account. Simply ask an existing user in your organisation to send you an invite.
- You are now ready to commence posting contract opportunities.

PUBLISHING OPPORTUNITIES

I am a buyer and I want to publish opportunities. How do I do it?

You can create a new opportunity on Open4Business Highlands and Islands in one of two ways:

- Create a new opportunity using the 'Add Opportunity' function, which is available in the Buyer Activity Centre and Opportunity Manager.
- Copy an existing opportunity in your 'Opportunity Manager' and then edit it. When you copy an opportunity all the details including the questionnaire and scoring plan are copied over. To use this feature, in your 'Opportunity Manager' click on the opportunity you want to copy, then on the 'Opportunity Details' page click on the 'Copy Opportunity' button. You will see the new opportunity listed in your 'Opportunity Manager' – click on it to open it, then click the 'Edit' button to edit.

When you use the Add Opportunity function, you are first asked to select:

- the Opportunity Type which indicates whether or not this is an 'Open Opportunity' or a 'Partnership Opportunity'; and
- the 'Opportunity Method' you want to use, which can be:
  - Contract Opportunity
  - Notice Only
  - Request for Quote

You do not have to complete the whole process in one session – you can start creating an opportunity and come back to it later before completing and publishing.

CREATING AN OPPORTUNITY – 6 SIMPLE STEPS

You will find everything that you require to post and manage opportunities, shortlist suppliers and award contracts in the 'Buyer Activity Centre'.

Step 1 – Opportunity Details: provide various details about the opportunity, including a description, relevant Business Categories, and procurement timetable.

Steps 2 & 3 – Standard and Customised Questions: construct a questionnaire for suppliers to answer online when responding to this opportunity.

Step 4 – Scoring: define the scoring plan for the questionnaire.

Step 5 – Supplier Statement: optionally request a specific Supplier Statement in relation to the opportunity.

Step 6 – Publish: review and publish the opportunity.

In Steps 2 and 3 you construct a questionnaire that suppliers will need to answer to get onto the shortlist for the opportunity. In Step 2 you can select questions from a bank of standard questions, while in Step 3 you can add further customised questions.

STEP 1 – OPPORTUNITY DETAILS

Many of the fields on this page are mandatory and marked with an asterisk (*).

Choose an Opportunity Name that will allow you to easily identify the opportunity in the future. Provide as much information about your opportunity because a supplier will need to decide whether to respond or not. If the information is too vague, you may find that some unqualified suppliers respond to it.

You can attach documents to the opportunity using the 'Document Upload' feature. You might use this to provide further information such as specifications or terms and conditions. Documents can be Excel (.xls), Word (.doc), Rich Text Format (.rtf) or Acrobat (.pdf) files. The maximum combined file size is 2MB.

You upload documents one at a time by clicking on the 'Browse' button, selecting the document and then clicking 'Upload'. You can delete files from the uploaded list if you change your mind.

You must select one or more Business Categories for the opportunity. These categories should relate to the type of supplier you feel will be best matched to the opportunity. Your choice of categories will determine which suppliers are matched to the opportunity and receive alert emails. You can use as many categories as you like.

STEP 2 – ASKING STANDARD QUESTIONS

This allows you to select from a bank of standard questions to add to your questionnaire. Choose questions that are genuinely relevant at this stage of your procurement process, rather than 'nice to know', and that will help you differentiate between suppliers.

Please be aware that:

- All questions are 'closed' questions, ie they all require Yes/No or multiple choice answers. Suppliers cannot provide narrative answers or submit documents at this stage.
- You will not see supplier's answers to these questions – instead the portal will automatically calculate each supplier's total score based on the scoring scheme you define in Step 4.

STEP 3 – ASKING CUSTOMISED QUESTIONS

You will certainly want to ask some specific questions that are not covered in the standard questions. This page enables you to add up to 35 of your own questions to the questionnaire.

Click 'Add Question' to create a new question. You can design a question to have a Yes/No answer; or you can design multiple choice answers, where you can specify the allowed answers.

STEP 4 – SCORING YOUR QUESTIONS

For all of the standard and customised questions that you have chosen, you must allocate a score in every box for every available answer for every question. You can use any whole number value including zero and negative numbers.

You can also identify which are your essential criteria – ie the critical questions that suppliers must answer correctly in order to be shortlisted for this opportunity. Simply tick the 'Essential Criteria' box alongside the relevant questions. Note this applies only to Yes/No questions. Ticking the 'Essential Criteria' box means that when the questionnaire is presented to the supplier these questions must be answered first, and it is explained that the buyer has defined these as essential criteria.

The first time you fill in the 'scoring section' you may want to take some time to carefully consider your overall approach. Look through the whole list of questions first, and decide which should carry the highest weighting in your scoring. It's good practice to rank the questions in order of importance and then try to decide if the answers to one question are twice as important as another or even 10 times as important.

Once you have ranked your questions, try starting with the least important questions and give the answers single digit scores. Then move through the rankings of your questions and if the next highest is twice as important choose scores that reflect that.

For the multiple choice questions consider what the 'threshold' answer is, and score accordingly. For example, if having 11 or more specialist staff is a sufficient threshold, and anything more than that is acceptable, then you could allocate equal marks to anyone answering 11–15, 16–20, and above.

Investing some time at this stage can pay dividends. Remember that once you have created a scoring system for one opportunity you can apply it to others by making a copy of the opportunity and editing it appropriately.

A well considered and designed scoring system will help you get the most from Open4Business Highlands and Islands – but don't overcomplicate it!

STEP 5 – SUPPLIER STATEMENT

You can optionally request that each supplier provides a specific Supplier Statement when responding to the opportunity. The Supplier Statement is a narrative answer to a question of your choice – you can select one from a standard menu of questions, or write your own. You will be able to view the 'submitted Supplier Statements' when carrying out the shortlisting process.

When requesting a Supplier Statement think about the evidence that you need from potential suppliers to demonstrate that they can deliver your contract.

STEP 6 – PUBLISHING YOUR OPPORTUNITY

The Publish page tells you if your opportunity is complete and ready to publish. If you have omitted any mandatory information or left some questions un-scored, the 'summary table' will indicate this in the Status column. Use 'Previous Step' to go back and correct any problems.

Once you have rectified these and are confident that your questions and scoring are ready, you can click the 'Publish' button on Step 5. You will be presented with a Confirmation page – click 'Publish Now' to confirm.

Your opportunity is reviewed by the SSE O4B Help Desk before being approved for publication, to ensure only appropriate material and opportunities are published.

This should happen within one working day, and you will receive an email confirming that it has been published or explaining why it has not been approved.

At any time you can go to the Opportunity Manager in the Buyer Activity Centre to see the status of all opportunities you have created. When an opportunity has been approved the status is 'Open', which means that other users of Open4Business Highlands and Islands can view the opportunity and respond to it.

Once your opportunity has been approved and published, email alerts will be sent to all suppliers with matching Business Profiles.

SUPPLIER LONG-LISTS

Once your opportunity has been posted and the response deadline has passed, view the long-list of potential suppliers in the Opportunity Manager section. Suppliers are ranked by the scores achieved from answering your standard and customised questions. To ensure a fair and equal process, supplier details are kept anonymous at this stage.

SHORTLISTS

Clicking 'Create Shortlist' selects your 'shortlist' and also locks the 'scoring plan' so you can no longer amend the weightings. It is only at this point that you can see the names of the suppliers.

The 'shortlist' is displayed with the suppliers' names and contact details. You can:

- Exclude suppliers from the 'shortlist' at this stage (but once excluded they cannot be added back)
- Add more suppliers from your 'long-list'
- View and download the detailed responses provided by each supplier on the shortlist
- Use the portal to send an email to the shortlisted suppliers informing them that they have been shortlisted and including your 'next steps' instructions

Clicking 'Close Shortlist' sends an email to those suppliers who have been unsuccessful in being selected. You enter a general feedback message for the unsuccessful suppliers which is included in the email, along with details of their score, the maximum achievable score, and how many responses to the opportunity were received.

AWARDING YOUR CONTRACT

It is a condition of using Open4Business Highlands and Islands that you update the portal with the opportunity outcome and also provide feedback to suppliers whether or not the competition has been run within the portal or outside it.

Creating an award

Click the, 'Create Award' button on the Opportunity Details page. Identify who has been awarded the resulting contract(s) – these can be suppliers from the shortlist or other suppliers you may have sourced from elsewhere ('external' suppliers). You may also enter the actual contract value(s).

Fill in the 'feedback field' for each unsuccessful shortlisted organisation. This information is only seen by that organisation and is not made public.

ENGAGING WITH SSE

SSE is involved in the generation, transmission, distribution and supply of electricity. We are also involved in the production, storage, distribution and supply of gas. We own over 13,000 megawatts of electricity generation capacity, distribute electricity to 3.5 million homes and workplaces and supply electricity, gas and other services to around 10 million customers.

With this diverse range of activities across our different business units, it has been necessary for us to simplify the way that our suppliers register with us. So we have worked to develop a Supplier Registration System (SRS) that gives us visibility of our existing and potential supply base across all our different businesses and different locations. Our procurement teams then use SRS to identify suppliers for the products and services we want to buy.

For more detailed information, download our SRS brochure, or to initiate registration (new or existing suppliers), please visit www.sse.com/PotentialSuppliers. The products or services you offer will determine what you have to do next.

Please note that Open4Business is a separate online portal from our Supplier Registration System, and there may be a duplication of information when you are creating your Business Profile.

STAKEHOLDER INFORMATION

RJ McLeod (Contractors) Limited is a privately owned company operating within the civil engineering market working through offices in Dingwall and Glasgow.

Our annual turnover is circa £80m, incorporating individual contracts of between £0.1m and £20m in value. The company remains one of Scotland's largest privately owned construction companies, employing 147 staff and 247 operatives supported by a plant and transport resource of approximately £12m.

The company is accredited by the British Standards Institute as operating a Quality Management System complying with the requirements of BS EN ISO 9001:2008, an Environmental Management System complying with the requirements of ISO 14001:2004 and a Health & Safety System complying with the requirements of OHSAS 18001:2007. We have a dedicated Quality, Health & Safety, Environmental and Training department made up of several full-time professionals and have implemented Health & Safety procedures to ensure the company continues to meet its legal obligations in relation to the safety of its employees, subcontractors and the general public. The company has accreditation with Constructionline, UVDB Verify and the Contractors Health and Safety Assessment Scheme (CHAS).

Since the formation of the company in 1951, RJ McLeod has been associated with a variety of civil engineering disciplines. Today the company's portfolio includes renewable energy, electrical infrastructure, site infrastructure, streetscaping, both local and national road construction, marine and waterways, work in the water industry, nuclear decommissioning, and land remediation and development related to industrial, housing, commercial and retail projects.

The company's list of clients includes energy companies, the Scottish Government, local authorities and other public organisations, Local Enterprise Companies, Scottish Water and a wide variety of private sector organisations.

SCDI

The Scottish Council for Development and Industry (SCDI) is Scotland's leading economic development organisation. Our aim is to influence and inspire government and key stakeholders to create sustainable economic prosperity for Scotland, an ambition as relevant today as it was when SCDI was established in 1931.

SCDI opened its Inverness office in 1965 with the aim of supporting a strong and vibrant economy for the Highlands and Islands, to be a voice for the region to decision makers across the country, and with a commitment to the growth and development of the area.

Our membership has a broad sectoral and geographic base and the fact that Highlands and Islands members are part of the Scottish membership as a whole – one organisation with no divisions – enables immediate access for these businesses to Scottish, UK and global networks.

SCDI's members include global corporations, SMEs, colleges and universities, government agencies, local authorities, trade unions and charities. This unique gathering of knowledge, experience and talent provides a dynamic and creative force for change.

For more information contact:

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W: **www.scdi.org.uk**

HIGHLANDS AND ISLANDS ENTERPRISE

As the Scottish Government's economic and community development agency for the North and West of Scotland, in line with the Government Economic Strategy (GES), our purpose is to generate sustainable economic growth in every part of the Highlands and Islands. If you are an account managed business and would like to discuss how to do more with the Open4Business portal, please contact your account manager who will be happy to advise.

If you are not currently account managed by HIE and would like to know more about how businesses with high growth potential become account managed, please contact Business Gateway on
T: **01463 713889**
E: **bgateway@highland-opportunity.com**
W: **www.highland-opportunity.com/business-gateway**

INVERNESS CHAMBER OF COMMERCE

Inverness Chamber of Commerce is the largest independent business organisation based in the Highlands. It is run by members of our business community to promote economic growth in the area. As an independent membership organisation, we receive no public funding or grants and our main purpose is to support the business activities of our member businesses. We do this by offering a wide range of benefits and services and lobbying on our members' behalf. As well as providing events, networking, support and advice to its members, Inverness Chamber actively campaigns for investment in infrastructure and transport, to ensure that the specific needs of its business community are met.

Membership of Inverness Chamber of Commerce offers a wide range of benefits – from contacts and networking, events and meetings to representation and information, and the full package of British Chambers of Commerce business services.

Growing Your Business

- Networking, B2B and staff development opportunities – over 30 events per year
- Members directory – available to download
- Chamber website listing and Scottish Chambers of Commerce directory listing
- Online promotion and networking – Facebook, Twitter and LinkedIn
- Business mentoring
- Sponsorship opportunities
- Partnership opportunities

Representing Your Interests

- Lobbying and campaigning – making the case for Highland business at all levels of government
- Consultation – representing members' views
- *inbusiness* magazine – opportunity for members to share news and raise their profile
- *Chamber eNews* – keep up to date with events in the area and share your events

Saving You Money

- FREE Chamber HR, Health & Safety, and legal expenses insurance
- FREE *mi inverness* listing – reach thousands of local consumers
- Discounted rates on merchant services, primary health cash plan, IT solutions, communications, energy services, fleet roadside assistance, member to member services, boardroom and hotdesk hire, export documentation services and business banking

www.inverness-chamber.co.uk

BUSINESS GATEWAY

- Service covers Highland and Moray and offers one to one business advice
- Business training workshops
- Access to market research information and specialists
- Enterprise Trust owned by Highland Council
- Established in 1986 with 15 dedicated Gateway staff

Where are we?

- Walk-in Shops in Inverness and Elgin and Development Officers in Caithness, Sutherland, Ross-shire, Badenoch, Skye and Lochaber

What products do we offer?

- Prince's Scottish Youth Business Trust Employment Grants
- Highland Opportunity Loan Fund
- Community Enterprise Loan Fund
- Enterprise Europe Network
- Recruitment Advice Service

How it works

- Client contacts Business Gateway via phone or email or visits one of the shops
- Meeting with a Development Officer or a Specialist Adviser

Contact Us

T: **Business Gateway (Inverness) 01463 713889**

T: **Business Gateway (Elgin) 01343 563634**

E: **bgateway@highland-opportunity.com**

W: **www.bgateway.com**

ENERGY NORTH

Energy North is a not-for-profit trade group of over 170 members in the oil and gas, renewable energy and nuclear markets. Our area of operation covers Aberdeen, Orkney and Shetland, Caithness, Ross-shire, Inverness, Moray, Argyll and the Outer Hebrides.

Our members are typically small to medium enterprises in the supply chain of the energy industry though we count many renewables developers, major utility companies and some of the leading players in oil and gas within our membership.

On behalf of the group we promote the available skills, services and facilities to the energy markets in the UK and beyond. We do this through trade missions, exhibitions, media engagement, political lobbying and events.

Energy North's activities include:

- The development of Ignite, a comprehensive energy project database for exclusive use of members
- Targeted members meetings to address issues and areas of concern
- Trade missions and exhibitions promoting our members and the wider area to the rest of Scotland, the UK and abroad
- The development of a major skills plan for the area
- Regular events for networking and information on the energy industry
- Weekly updates around the group on forthcoming events, relevant news articles, information on funding etc
- A quarterly newsletter with informative articles from key stakeholders, members and other relevant bodies
- Political lobbying of both UK and Scottish Parliaments

If you would like to find out more about Energy North and how we can help your business, please call the office on **01349 854968** or email **info@energynorth.co.uk**. Alternatively, you can find out more about what we do on our website **www.energynorth.co.uk**

BiP SOLUTIONS

BiP was established in 1984 to facilitate business between the public and private sectors. We employ over 170 personnel in Glasgow and London to provide procurement, supply-chain and economic development solutions and services.

We support procurement, supply chain and supplier engagement optimisation programmes for clients across the public and private sectors in the UK and beyond and we are an established authority in this complex and often changing environment.

Over 550 public awarding authorities in the UK use eSourcing services from BiP to manage their entire tendering cycle and we offer buyers and suppliers access to the world's largest database of current open contract opportunities.

BiP SOLUTIONS DELIVERING EXCELLENCE THROUGH INNOVATION

We achieve successful procurement and supply chain improvement outcomes for our clients through the optimisation of organisational structures, processes, technologies and information use.

BiP is a values-based organisation. Passion, Integrity and Respect are the core values that guide what we do and the relationships that we build and maintain. Our culture is one of continuous improvement and investment into our services, infrastructure and people.

www.bipsolutions.com

BAM NUTTALL

BAM Nuttall is one of the UK's leading civil engineering companies and a member of the European construction group Royal BAM, one of the largest construction groups in Europe with annual revenues for 2011 of £7.9bn. The BAM business has a reputation for innovation in providing integrated construction solutions for complex projects in a range of sectors. In Scotland we are particularly focused on the energy, rail and maritime markets.

Our first contract in Scotland was secured in 1935 and we have been continuously employed on a diverse range of civil engineering projects throughout Scotland since 1946. We established a permanent office locally in 1969. Since 1986 our local business has been based in Kilsyth, to the north-east of Glasgow. From here, BAM Nuttall operates throughout the mainland and islands of Scotland with an annual local turnover of around £100m and over 300 direct employees.

Since securing our first contract in Scotland in 1935 the BAM brand has become synonymous with major civil engineering projects across the country. We're particularly proud of our heritage in renewable energy, having built many of the country's early hydro projects including Sloy, Cruachan and Foyers.

We recognise the vital role played by our suppliers in helping us deliver challenging projects in often remote and sensitive environments. Open4Business is now central to our local procurement strategy, helping us to promote opportunity early and ensure local businesses remain fully engaged with our project teams.

ABB

ABB is a global leader in power and automation technologies. We employ 145,000 people and operate in approximately 100 countries, including Scotland.

Since establishing an East Kilbride office, as an integral part of its UK Grid Systems centre of excellence and Substation businesses, ABB has continued to forge close relationships with its Scottish customers and supply chain, and these are playing a key role in the effective delivery of some major power projects.

A major focus of ABB's work in Scotland, and the Highlands and Islands in particular, is to strengthen transmission and distribution networks, as well as working with power generators, distributors and users to pave the way to make use of the excellent natural resources for renewable electricity generation.

Examples include a contract to upgrade Scottish Hydro Electric's substations, including those in Caithness, Orkney and Shetland, which ABB will deliver with partners from an office in Kintore, Aberdeenshire.

SP Energy Networks has ordered a major new power transformer to reinforce the power network in southern and central Scotland. A substation in the Lake District is also being fitted with the UK's first TCSC (thyristor controlled series compensation) equipment, which is being installed to boost Scotland's capacity to export power south and help meet National Grid's renewable energy targets.

Aside from this, ABB has a thriving operation in Aberdeen, which serves the oil and gas industries, and it also employs service professionals throughout Scotland.

In addition, ABB has strong links with many of the country's universities as well as trade bodies such as Scottish Renewables.

Recognising the potential in wind and wave power, ABB is a major investor in Aquamarine Power, a wave energy technology company that is currently developing a 40MW wave energy farm off the Isle of Lewis. We have also invested in Scotrenewables Tidal Power Ltd, which is developing a 2MW tidal energy farm in the waters off Orkney.

BALFOUR BEATTY

We are Balfour Beatty, a global infrastructure group operating around the world – designers and planners, engineers, builders, project and facilities managers, analysts, consultants and more.

For more than 100 years we have created and cared for the vital assets that enable societies and economies to grow: road and rail; airports, seaports, tunnels and bridges; health and education facilities; heat, light, power and water; places to live and places to work – the infrastructure that underpins all our lives and drives progress.

From our first contract in 1909 to construct a tramway in Dunfermline, we have grown to become a global business operating in over 80 countries, in emerging and mature economies alike. We are now one of the few companies with the skills to deliver complex projects of huge scale and take advantage of the growth in long-term infrastructure markets.

Balfour Beatty

In the 1930s Balfour Beatty pioneered the development of hydro electric power and constructed dams, tunnels and power stations across the Highlands to provide power for an ever-increasing demand. This was the roots of Scottish Hydro and SSE. George Balfour, who owned an estate in the Highlands, is honoured for this innovation with a bronze plaque on Tummel Power Station – one of the first to generate electricity.

The combined breadth of our capabilities and depth of our technical expertise makes us a true global leader in infrastructure. The dedication of our people and the shared values that unite us give our many stakeholders the confidence to trust us and do business with us. We have a collective commitment to operate sustainably and safely wherever we operate.

SUPPORT

For support on Open4Business Highlands and Islands please contact the SSE Support Team:
Email: **sse.open4business.highland@sse.com**

O4B Highlands and Islands | Powered by SSE

www.sseopen4business-highlands.com

Open4Business

The journey of the award winning Highlands & Islands procurement portal

Open4Business – where it all began

SSE has always employed local people, worked with local companies and played an active role in the economic development of the regions we operate in. It is important for SSE as a responsible developer that anyone living in a community where SSE operates sees the benefits that our business opportunities can make to the local economy. As such, in June 2012 SSE launched **Highlands and Islands Open4Business (O4B)**, an online procurement portal that offers Highland organisations the opportunity to do business with SSE and our principal contractors.

The portal was inspired by the London 2012 CompeteFor website which attracted over £2bn of Olympics-related contracts to local SMEs, the portal improves visibility of the SSE Procurement process and opens up opportunities for local businesses to express an interest in contracts for FREE.

sse O4B
Highlands and Islands

The initiative

- New and innovative web platform
- Promotion of local procurement
- Open up our supply chain
- Encourage and support economic development in the areas we operate in
- Be seen as the most Open4Business company in the industry

Objectives

- Regional contract opportunities
- Maximising local benefits
- Engaging effectively with SMEs
- Legacy for economic development and innovation

sse O4B Highlands and Islands

Our Stakeholders

In order to ensure maximum success of the portal SSE recognised the importance in involving our supply chain and encouraging the use of O4B across the North of Scotland.

Our stakeholders have played a huge part in overall success of the portal, from the support we have received from HIE, Inverness Chamber of Commerce and Business Gateway to the wide range of opportunities from RJ McLeod and Siemens, to name a few.

It always has been and continues to be crucial to ensure this portal is used across the North of Scotland by a wider range of suppliers both on SSE sites and other major projects going on across the region.

SIEMENS
The Highland Council Comhairle na Gàidhealtachd
inverness CHAMBER OF COMMERCE
bam nuttall
HIE Highlands and Islands Enterprise Iomairt na Gàidhealtachd 's nan Eilean
RJ McLEOD
BiP SOLUTIONS DELIVERING EXCELLENCE THROUGH INNOVATION
ABB
business gateway slighe gnothachais
Balfour Beatty
scdi Scottish Council for Development and Industry
sse O4B Highlands and Islands

Our Stakeholders cont'd

Our stakeholder's view

- "The Open4Business Highlands and Islands portal continues to provide us with opportunities to engage with the wider supply chain in this area. We are currently working on Blackhillock Substation and have engaged with Global Infrastructure Ltd, based in Muir of Ord. Global responded to an opportunity we advertised on the portal for a Building Subcontractor to carry out the construction of the three control buildings. The relationship has proven to be a great success; we are now seeking future opportunities in the Highlands and Islands where we can continue to work together.
- "Looking towards the future BAM Nuttall has recently been awarded a contract as part of the Highland Enhancement Programme from Network Rail. This project will see major infrastructure improvements on the Inverness to Perth and Aberdeen to Inverness rail lines over the next five years. We are excited to be using Open4Business as a platform to advertise potential opportunities that will exist on the project and which will ultimately benefit local communities. This is a chance for us to really do things differently." **- David Timmons – Senior Buyer Scotland and Northern England, BAM Nuttall**

- "We have used SSE Open4Business successfully for some of our biggest contracts across the North of Scotland, not only for SSE but also for other major clients. Where O4B has been utilised we have found the process to be simple, providing a channel to local suppliers that may have otherwise not been considered." **– Balfour Beatty**

- "We have successfully used SSE O4B on not only on SSE projects, but also where SSE were not the Client. Where we have used O4B, we have found that it opens up the market , introducing us to suppliers that we would not necessarily have previously known about." **– Jamie Corser, RJ McLeod**

Timeline

June 2012	April 2013	June 2013	September 2013	March 2014	April 2014	September 2014	April 2016	January 2017
Launch	500 Registered suppliers	£1m awarded	Winner of SCDI Excellence in Business Service and Engagement award	1000 Registered suppliers	100 contracts awarded	Winner of Green Energy Award for Contribution to supply chain Development	£50m awarded	£100m Awarded

As you can see from this Timeline over the last 6 years the Highlands and Islands portal have been highly successful in delivering a real economic benefit to the local areas we, and our supply chain, operate in.

sse 4B
Highlands and Islands

Key Achievements

Key Achievements from June 2012	
Registered Suppliers	2234
Opportunities posted	> 750
Awarded Contracts	465
Value of Contract awards	> £174 Million
Suppliers helped by Business Gateway	> 300

sse 4B
Highlands and Islands

Figures of Success

Key Figures	
Financial year	**Award Value**
2012/2013	£58,038
2013/2014	£5,267,801
2014/2015	£24,810,401
2015/2016	£37,308,882
2016/2017	£35,545,622
2017/2018	£12,838,075

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Highlands and Islands

KPI’s 2017_18

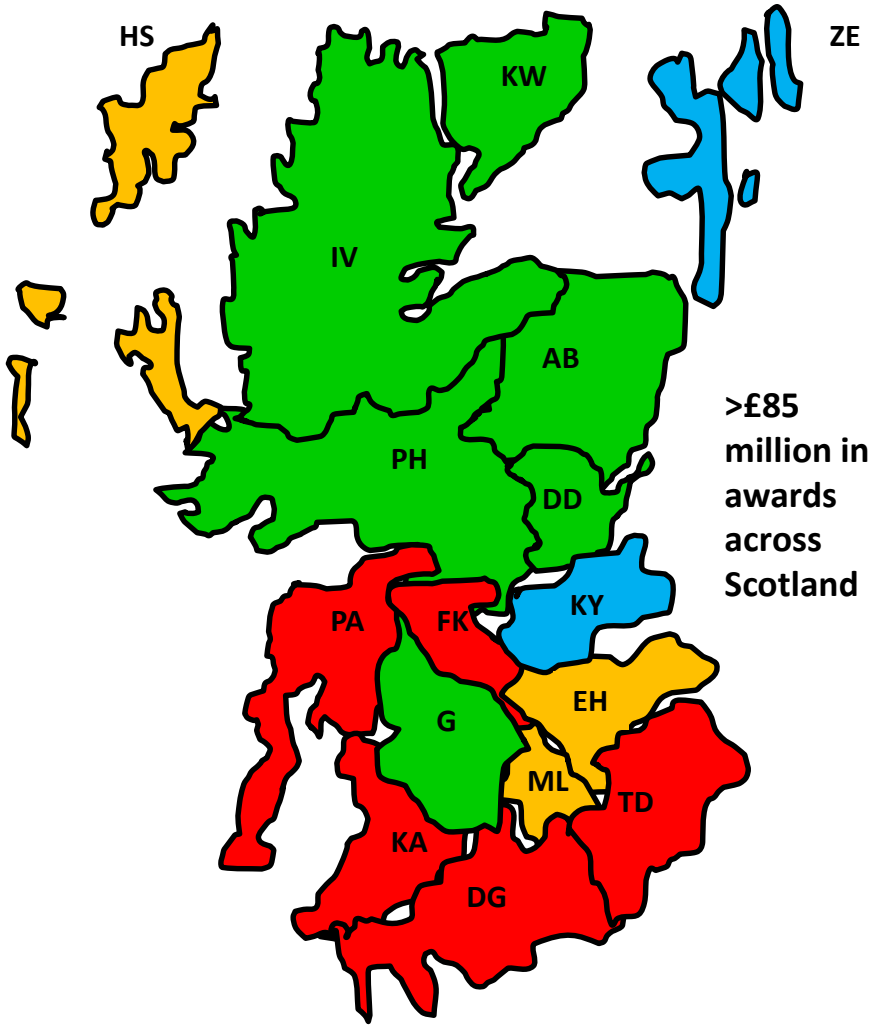
Open4Business Highlands & Islands
KEY PERFORMANCE INDICATORS

	Ref	Activity	Owner	Definition	Measure	Target 17/18	Financial Year 17/18	O4B (Total)	RAG Status
Volume	1	Number of organisations	Total		Number	500	104	2234	Green
			SME Organisations		%	70%		69.83%	
	2	Number of organisations published	O4B		Number	65%	60	1470	Green
								65.80%	
	3	Number of opportunities posted (RFQ,Ops & NO's)	SSE		Number	150	2	420	Red
			SSE Tier 1	RJ McLeod Balfour Beatty Siemens Babcock Networks Ltd AMEC Bam Nuttall Shell UK Powerteam ABB		250	50	342	Red
			Independent Supply Chain			50	1	14	Red
	4	Number of awards	SSE		Number	75	3	308	Red
			SSE Tier 1	RJ McLeod Balfour Beatty Siemens Babcock Networks Ltd AMEC Bam Nuttall Powerteam ABB		100	19	245	Amber
			Independent Supply Chain				0	6	Red
	5	Value of awards	O4B		€Value	>€17.5	€12,838,075	€174,320,174	Green
	6	Award ratio	SSE		€Value	30%	14%	55%	Green
			Tier 1		€Value	70%	86%	45%	Amber
Helpdesk	7	Volume of Queries	Helpdesk		Number of queries received	n/a	127	8817	Green

	INFORMATION ONLY:					Target 17/18	17_18 O4B Total	RAG Status
Awarded Data	9	Award Ratio	SSE/Tier 1		%	30% / 70%	55%/45%	Green
	10	Average award value	O4B		€Value	>€52,000	€583,548	Green
	11	% of awarded contracts to H&I region	O4B		%	>80%	50%	Amber

Open4Business Heat Maps From 2012

Awarded Contracts Heat Map



>£85 million in awards across Scotland

KEY CODE

Companies

20+
9-19
1-8
0

No of Awards	
AB	48
DD	20
DG	3
EH	10
FK	8
G	40
HS	16
IV	133
KA	6
KW	45
KY	0
ML	11
PA	5
PH	49
TD	3
ZE	0
TOTAL	**397**

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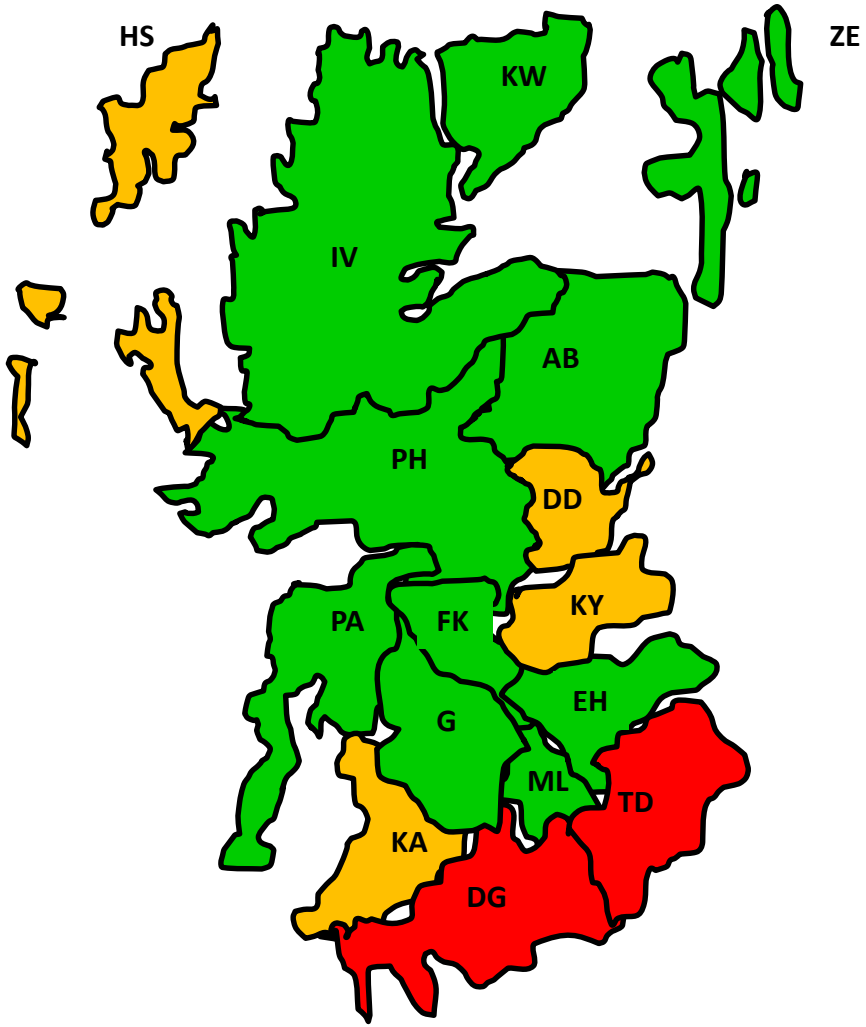
Published Suppliers Heat Map



KEY CODE Companies
20+
9-19
1-8
0

No of Companies Published	
AB	203
DD	17
DG	5
EH	97
FK	25
G	128
HS	11
IV	250
KA	16
KW	98
KY	15
ML	22
PA	33
PH	77
TD	3
ZE	25
TOTAL	**1025**

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Case Studies

Case Studies

Case Study 1: RJ McLeod
Opportunity: Bhlaraidh Wind Farm - Concrete Pump Hire

As part of enabling civil engineering works at our Bhlaraidh windfarm site, Tier 1 contractor RJ McLeod required a concrete pump and operator for the site. After advertising on Open4Business, the contract was awarded to Garriock, a Shetland SME operating in the Highlands.

Case Study 2: Siemens
Opportunity: Bhlaraidh Wind Farm - Concrete Pump Hire

During construction of our substation at Fyrish, Siemens required design, fabrication, coating and delivery of the steel structures to support their panels. The opportunity was awarded via Open4Business, to HadFab, a supplier from the Edinurgh area with a rich history in the electricity industry.

Case Study 3: SSE Networks
Opportunity: Annual Order - Various Tools and Equipment

O4B can also be used for frameworks and large orders for goods. In this case, our Power Distribution team were searching for a supplier for fixings. Their use of Open4Business led them to award the contract to William Johnstone & Company of Inverness, a Highland SME with less than ten staff.

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Events

Events

Over the last 6 years the Open4Business team have hosted and supported a number of great events in the local communities in and around the North of Scotland.

It all began with the Launch…

- A highly successful event to kick start the portal, held on the 21st of June 2012 at Eden Court in Inverness. Key representatives in attendance from our supporting stakeholders
- 2013 saw over 11 different events, mainly in support of the SSE Wind Farms in planning and going into construction at that time. Also attending the SCDI business awards to collect our prestigious award on the night.
- 2014 was slightly quieter for the team with 5 events to attend from Peterhead to Perth
- 2015 saw the team venturing out to 4 main events spreading the word of the O4B Portal.

Along with all the events hosted the team also supported many SSE events, ensuring each one saw more people registered and ready to benefit from using O4B.

Promotional Material

Open4Business

SSE recognises that as a large organisation, we have a responsibility to ensure that we bring benefits to the areas where we work.

Open4Business is a dedicated web portal, facilitating productive procurement relationships between SMEs and SSE, our contractors and any other users who post opportunities. In short, it's a simple way of getting involved with the supply chain for SSE, our partners and other businesses in your area.

Best of all, it's completely free to use.

How does it work?

1. Register your business.
2. Build a **business profile** to show your area of industry, capabilities and experience.
3. Post and respond to opportunities for the provision of goods, works and services.

The Open4Business portal had been developed as a platform to facilitate relationships between local buyers and suppliers. It allows users to promote opportunities in their supply chain, allowing other users to view and respond to these opportunities.

As far as we know, we're the first private sector company to stat this kind of initiative. We want to make sure our spend is kept local. We also want to make sure that businesses in the areas where we work can promote their own opportunities and extend their procurement reach. Local content is key.

> 2000 suppliers registered

> £170m of contracts awarded

> 460 separate contracts awarded

www.sseopen4business-highlands.com

Open4Business

The benefits to you?

- **Completely free to use**
- Provides clear visibility of contract opportunities
- Opens up supply chain engagement with large organisations
- Offers a matching mechanism when relevant opportunities are advertised
- Reduces costs
- Offers support from local business agencies

The benefits to us?

- Supports our sustainability values
- Reduces carbon footprint
- Significant step in support of our Corporate Social Responsibility goals
- Adds community value to our projects

www.sseopen4business-highlands.com

Governance

Governance

- **To ensure the project obtains and retains a clear purpose namely:**

- ‘to increase our engagement and improve our business connections at a local level while building our community presence’

- The discipline of a governance structure is required to monitor the scope, build, operation and review mechanisms of the portals’.

- Areas of control are shaping the culture, setting the tone, growth of the portals’ size and complexity of the system, reviewing of strategy with collective and individual ownership from the steering groups, operational groups and project management board and to provide an overarching vision of the portals’ operation and processes.

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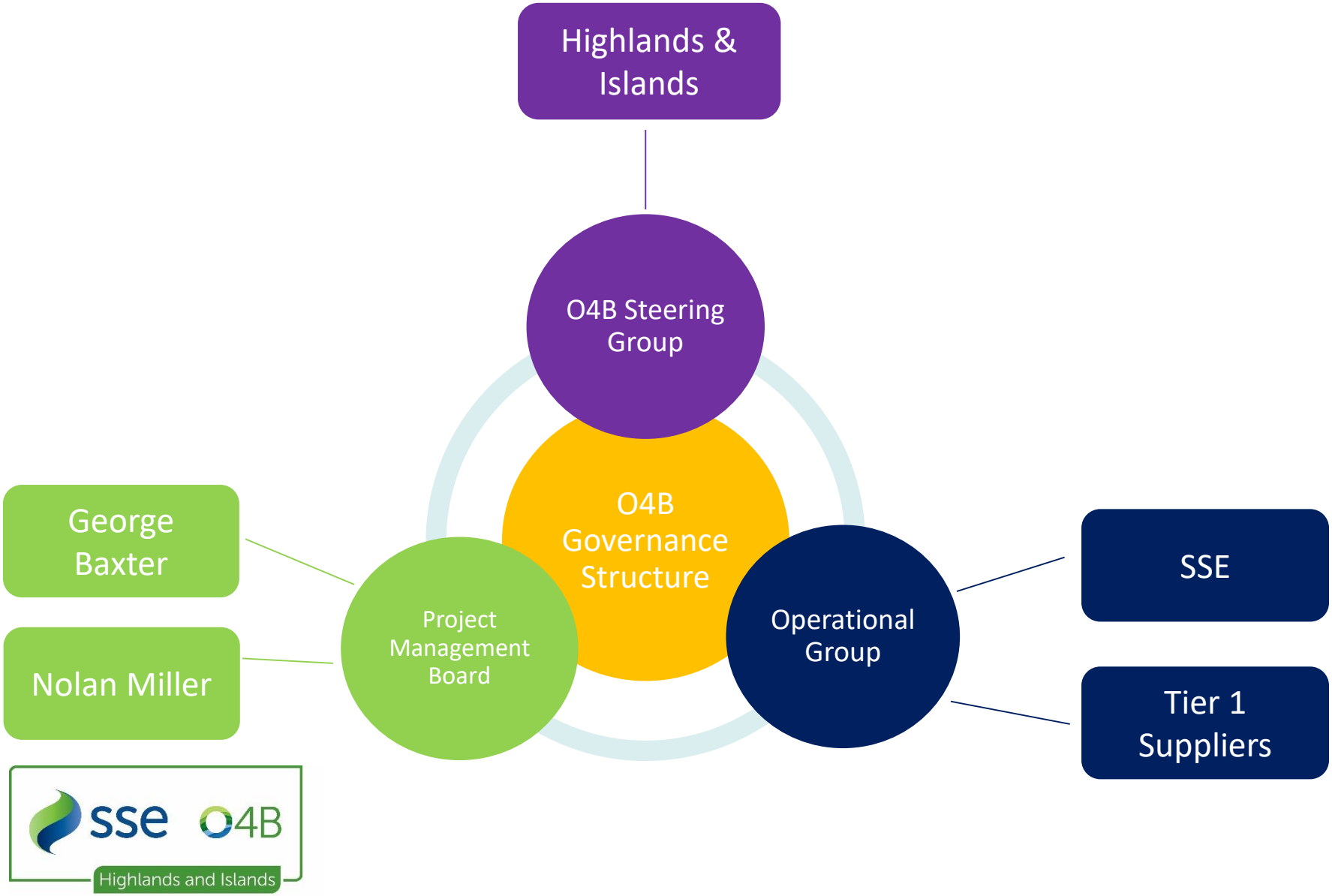
Highlands and Islands

Governance Structure



Flow down Clause

Open4Business Flow down Clause

In order to maximise the number and diversity of businesses contributing to the programme, the Contractor shall use the Open4Business web-sourcing portal to advertise all appropriate subcontractor and supplier opportunities which arise throughout the contract. The Contractor shall use reasonable endeavours to ensure that subcontractors and suppliers use the Open4Business web-sourcing portal to advertise further opportunities within the Supply Chain.

The Contractor shall monitor the number, type and value of contract opportunities advertised and placed in its own Supply Chain.

sse O4B Highlands and Islands

Thank You

Beatrice
Offshore Windfarm Ltd

Reducing Costs Now: Innovation Pre-2020
Beatrice Offshore Wind Farm Experience

L Goulding – Senior Engineering Manager

CIP
COPENHAGEN INFRASTRUCTURE PARTNERS

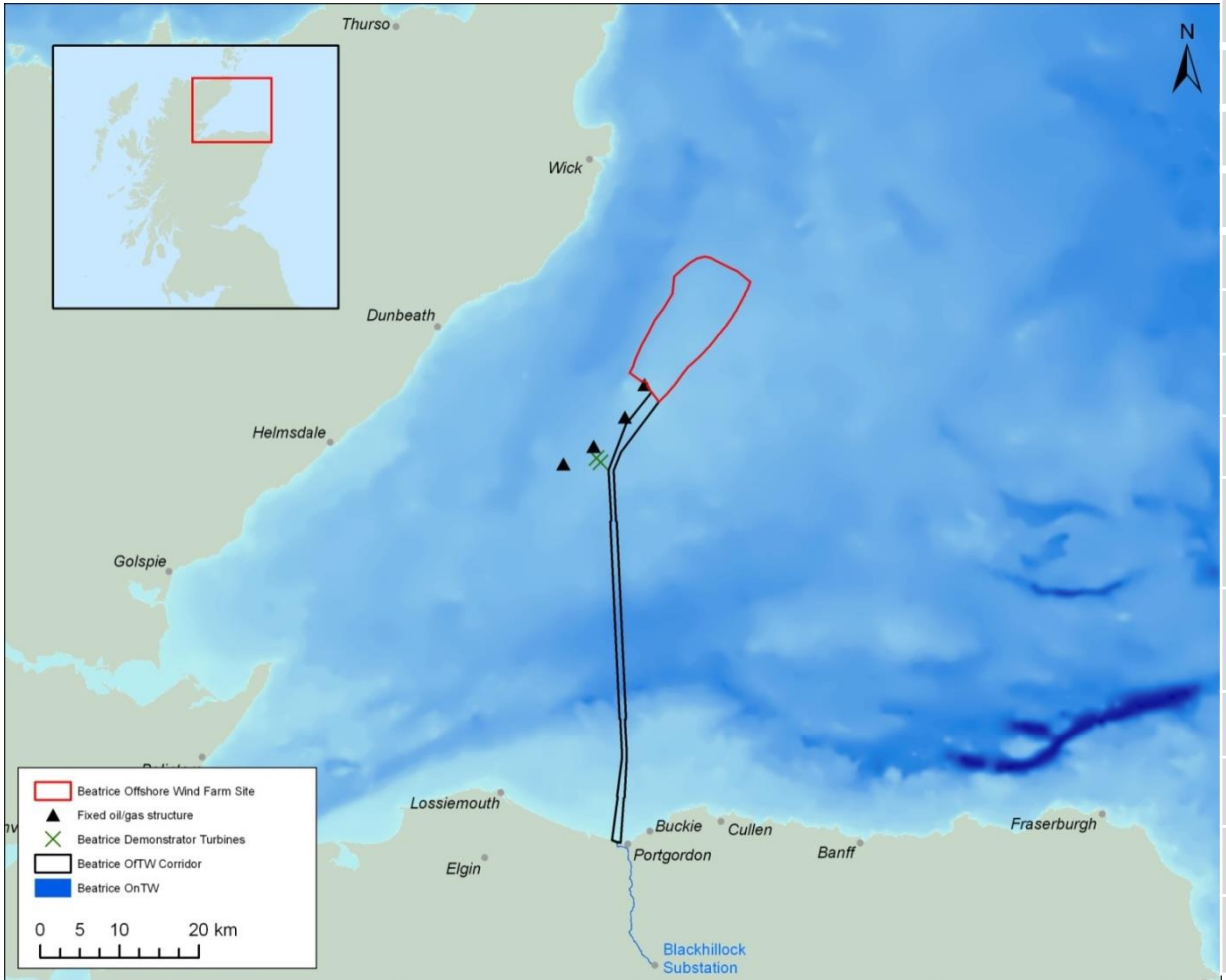
sse

REPSOL

Contents

- Beatrice Project Summary
- Project Approach to Innovation
- Project Concept Key Decision
  - Turbine type
  - WTG substructure type
  - Offshore Substation
  - Distribution system
- Questions

Beatrice Project Summary



Key Facts	
Capacity	588MW
JV structure	SSE40:Repsol25:CiP35
Consent	S36 Consent March 2014
Revenue Support	Investment Contract (CfD)
Finance	Bank Financed
Site Area	131.5km^2
Distance from shore	13.5km from Caithness
Water Depth	35m – 65m
Grid Connection	588MW AC to Blackhillock substation – January 2018
Foundations / Substructure	Piled Jackets
Turbine	Siemens 7MW
I/A Voltage	33kv
Export Voltage	220kv
Delivery Strategy	3-Way EPC Split

Project Approach to Innovation

Beatrice Offshore Windfarm Ltd

- Innovation Drivers
  - Performance
  - CAPEX
  - OPEX
  - Internal Rate of Return (IRR)
- Innovation Barriers
  - Bank Finance
  - Timing
  - Risk
- Project developed a process to assess the drivers and transparently make decisions, to balance risk and reward.

Turbine Selection

- Siemens Wind Power (SWP) selected as preferred supplier.
- SWP offered two turbines:
  - SWT-6.0-154 Used at SSE Hunterston and on Westermost Rough
  - SWT-7.0-154 Unproven machine with larger generator and other components.
- The 7MW machine was selected due to greater financial returns.
- However, as Type A certification was scheduled post FID some key risks required mitigation.
- BOWL and Lenders Technical Advisors carried out due diligence on the 7MW to mitigate programme, performance and reliability risks.
- ‘Bankability’ assessment completed by Financial Advisors to mitigate risk to obtaining external finance.
- SWP delivered Type A certification 6 months early.

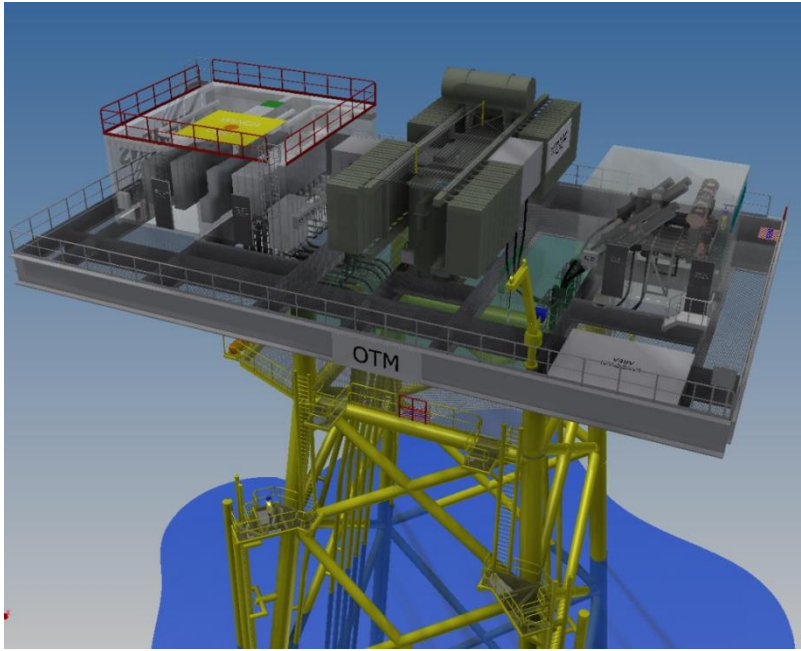
WTG Substructure Selection

Beatrice Offshore Windfarm Ltd

- Two feasible concepts shortlisted
  - Jacket on driven piles
  - Concrete Gravity Base Structure (GBS)
- BiFab/Atkins jacket concept used as jacket reference
- Design competition to asses GBS options
- Jacket Key Risks
  - Pile Refusal Due to Boulders During Piling – Mitigated through statistical analysis
  - Fabrication Yard Availability
  - Unproven Supply Chain for volume required
- GBS Key Risks
  - Concept Immaturity - Buoyant GBS supporting WTG had never been done. Has since been proven for a met mast at Fecamp.
  - Construction Yard Availability - Ardersier identified but not secured.
  - Unproven Supply Chain for volume required.
- Little to differentiate options by cost and risk.
- Jacket concept selected to minimise programme impacts.

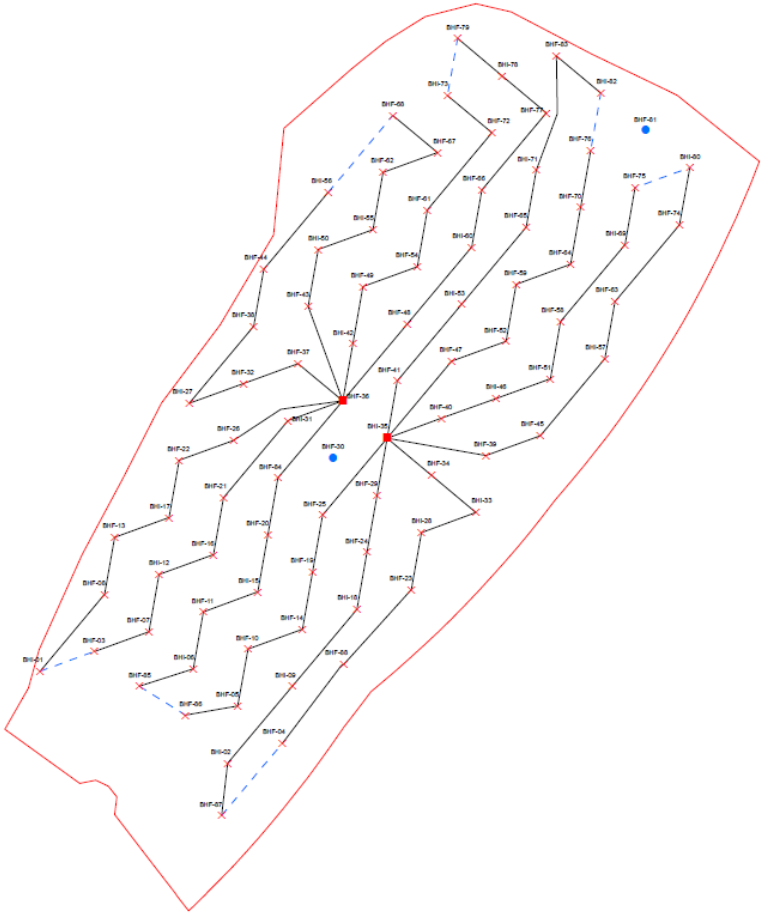
Offshore Substation Concept

- Two options considered:
  - A single conventional Offshore Substation Platform (OSP).
  - Two Offshore Transformer Module (OTM) platforms developed by Siemens Energy Management – one per circuit.
- OTM is a minimal facility platform and uses the standard wind turbine jacket design.
- OTM has capability to combine with a WTG. However, this was discounted due to commercial interface risk.
- CapEx savings of approximately £20m over a standard OSP design and significantly shorter lead time.
- OTM presents no significant additional technical risks
- OTM concept was selected with following risk mitigations.
- Cost benefit analysis presented to NGET for SQSS deviation. Formal acceptance by Grid Connection Modification Application.
- ‘Bankability’ assessment completed by Lenders Technical Advisor and Financial Advisor.



Distribution Voltage Assessment

- Three distribution voltage options considered:
  - 33kV
  - 48kV
  - 66kV
- Array layouts designed for each option.
- Preference for “wet” design cables due to cost.
- Engagement with supply chain on cable development.
- Type certified “wet” design cables do not exist for 48kV or 66kV.
- 48kV “wet” cables are not in development although Type certified 66kV “wet” cables are expected to be available 2016.
- Inter-array lifetime costs for 33kV and 66kV were found to be very similar.
- 33kV was selected as the distribution voltage, as the lowest risk option.



Beatrice
Offshore Windfarm Ltd

Any Questions?

Health & Safety Case Study 03 | November 2014

Forewind and Dogger Bank: An aerial approach to offshore inspections

About Forewind

Forewind Limited is a consortium of four leading international energy companies – RWE, SSE, Statoil and Statkraft – committed to securing the necessary consents required for the construction and development of offshore wind farms within the Dogger Bank Zone.

The Dogger Bank Zone is the largest and furthest from shore of all the UK's proposed wind farm zones. The weather and sea conditions are harsh and so maintenance of the turbines, foundations and infrastructure at the world's largest wind farm development will present a challenge both in terms of health and safety, as well as cost.

Initiative summary

Forewind has introduced the use of a remotely operated aerial vehicle (ROAV) to carry out bolt and structural inspections on its two Dogger Bank meteorological masts.

An ROAV is similar in concept to an underwater remotely operated vehicle (ROV) except that it operates in the air. Just like its underwater counterpart, an ROAV can be used as a tool to access areas of plant or equipment where it is not especially desirable to send a worker due to risk and safety concerns, such as working at height.

The ROAV is essentially a small multi-rotor, electric helicopter controlled remotely from the ground or a service vessel by a two-man crew – a pilot and an inspection engineer. Weighing less than two kilograms, the ROAV is fitted with camera equipment, which is operated by an inspection engineer on a separate control module to allow the pilot to focus purely on flying. The inspection engineer can pan, tilt and zoom the camera to obtain video and still imagery of the structure they are inspecting. Cyberhawk, the industrial inspection specialists, carried out the ROAV work.

The remotely operated aerial vehicle (ROAV) takes off for the meteorological mast inspection..

The high definition images captured by the ROAV identified the precise maintenance requirements for each met mast, meaning that the jobs could be better planned in advance – with appropriate tools and spares brought to site during the maintenance trip. The risk of discovering additional unplanned maintenance requirements during the main trip and having to return is also significantly reduced, which saves money and reduces wasteful downtime.

The ROAV circling the met mast.

Forewind was able to obtain a comprehensive photographic record of the met masts, making it easier to identify and track any issues.

The use of ROAVs in pre-maintenance inspections of the met masts has the potential to deliver significant savings and efficiencies in wind farm operation and maintenance, and importantly, reduce health and safety risks.

The main health and safety benefit from the ROAV is the fact its use significantly reduces the time anyone has to spend working at height or using rope access – essentially removing workers from potentially risky situations and instead using a drone safely operated from the vessel deck.

Background

Forewind applied experience from the oil and gas industry, and used an ROAV to inspect its two met masts on Dogger Bank in early 2014. The activity would normally require up to six rope access climbers more than two days per mast, however the ROAV was able to undertake the bolt inspection on each mast in less than a day. Far quicker than the time it would have taken if riggers had performed it using the traditional approach, and without the health and safety risks.

In addition to the main bolt inspection job, it was also possible to check a number of other items at the same time. This included undertaking a general structural survey of the lattice tower, the underside of the platform and the boat landing.

The use of the ROAV for these additional inspection tasks meant there was no need to employ rope access, where workers are suspended over water while carrying out their tasks. It also identified wave-related damage to an access platform and fall arrest system, so replacements could be brought on the trip.

Core value: Removing workers from risk situations

By removing the requirement for individuals to work at height, undertake vessel transfers or work in harnesses suspended on ropes over the sea, the use of the ROAV has reduced or eliminated a number of potential risk situations. It is a relatively simple solution to a number of potential health and safety risks that are inherent in traditional inspection methods.

The inspection engineer reviews the met mast from the vessel deck.

The meteorological mast inspection is one example of the use of this application but it has the potential to be used far more widely across the offshore wind energy industry, particularly during the operation and maintenance phase. Turbines and offshore infrastructure could all be inspected using this approach.

Risk reduction

The technique reduced the health and safety risks associated with transferring to the platform from a vessel, or more importantly climbing up the towers to work at height.

While operators still need to sail to the meteorological masts for on-site maintenance, this preliminary inspection technique helped Forewind to plan that visit and assess the type of work that would be needed once they arrived.

It definitely has the potential to be used more widely across the offshore wind industry to make efficiency gains and reduce health and safety risks during operation and maintenance.

Wider industry learning

One of the Forewind owner companies has now introduced the use of ROAVs for its own meteorological inspections. Another is planning to trial the technology for blade inspections showing that it has wide potential application than meteorological masts but can be used for exsiting wind farms – turbines and other offshore infrastructure.

In addition, Forewind's main engineering, procurement and construction (EPC) contractor Universal Foundation Norway (UFN) has, since the initial use of the ROAV, carried out two inspection trips to the Forewind meteorological masts. Both times they used the ROAV technology to perform inspection work, which completely eliminated the need for workers to transfer to the mast and perform work at height, but also removed the need for rope access over water.

Sharing the information

The approach was shared widely via a media release to the renewables press and accompanying stories in industry publications. It was published on the Forewind website and newsletter – Dogger Bank News – which is distributed both in hard copy and electronically to more than 5000 individuals and organisations. It also featured in Forewind's Annual Review 2014, which summarised the organisation's activity for the previous 12 months and was sent to more than 500 main stakeholders including statutory bodies, governmental organisations and key decision makers.

It was also the subject of a presentation given by Forewind's HSE Manager, Nachaat Tahmaz who talked about the case study, entitled "Forewind: Innovative inspections – Use of Remotely Operated Aerial Vehicles in Wind Farm Maintenance" at Renewable UK's Global Offshore Wind 2014.

The methodology and outcome of the trip was shared with the four Forewind owners and with key contractors.

Key impacts

This approach to offshore inspection has impacted positively in a number of ways:

1. It significantly reduces, or even eliminates, the need to work at height.

2. Likewise it reduces, or eliminates, the need to perform rope access work over water (when workers are suspended in ropes underneath offshore platforms and infrastructure to inspect for such issues as rust or cracks)

3. It minimises the amount of days spent offshore because all the preparatory work has been done by the ROAV. This represents a major cost saving on vessels, personnel and time.

4. The number of offshore personnel who are potentially being put at risk is reduced – because less time is required there is not the need for multiple shifts.

5. It also reduces the number of potentially risky transfers from vessels to the offshore structures.

6. It has the potential to be widely adopted by the offshore wind energy industry for operation and maintenance of not only met masts but also turbines and other offshore infrastructure.

Universal Foundation

Trial Installation: UK North Sea

Key facts:

- 2 structures
- Dudgeon, Dogger Bank and Hornsea
- 24 days
- 29 installations
- 0.1 degree inclination or less

The Project

In September 2014, Universal Foundation completed a trial installation campaign across three major Round 3 offshore wind sites (Dogger Bank, Dudgeon and Hornsea) in the UK North Sea.

The trial installation project focused on penetration ability, verticality, water injection impact on soil plug, forces and stress in skirt structure and internal soil levelling capability.

A scaled down version of the Mono Bucket measuring 8m in diameter with a 6m skirt, as well as a reference structure of 4m diameter with a 6m skirt, was used in the trial installation campaign.

The Partners

The project was undertaken as part of The Carbon Trust's Offshore Wind Accelerator (OWA) programme, which Universal Foundation has been part of since 2009, when they became one of four novel cost reducing foundations to be shortlisted following an international competition run by The Carbon Trust's OWA to discover world leading innovation in this area.

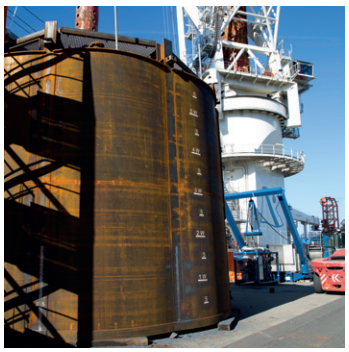
The project was managed by Statoil and delivered by Universal Foundation, in partnership with The Carbon Trust, Statkraft, EON and DONG Energy, in close cooperation with Aalborg University. It also received funding from EUDP – a part of the Danish Energy Agency.

The Process

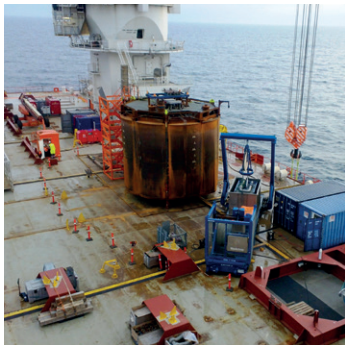
Fred. Olsen Windcarrier's installation vessel Brave Tern departed from Frederikshavn, marking the start of the campaign. The trial installations took place in the North Sea and tested a wide range of different locations all meticulously and individually selected by the developers due to their challenging and varying soil properties. Soil characteristics within the three sites varied from soft clay, moraine clay, boulder bank clay – with sand spikes and layers, clay crust, sand and silt. Within the 24 day campaign, 29 installations were achieved between the two structures.

The Mono Bucket Performance

The trial installation demonstrated that the performance of the Mono Bucket exceeded



Universal Foundations Mono Bucket before installation trial begins



The Mono Bucket awaits its final trial of the campaign

The reference structure - 4m in diameter with a 6m skirt

Universal Foundation

Trial Installation: UK North Sea - continued

Soil types:

- ✓ soft clay
- ✓ moraine clay
- ✓ boulder bank clay - with sand spikes and layers
- ✓ clay crust
- ✓ sand
- ✓ silt

the predictions and that the suitability of the concept goes beyond the expected limitations. Further, with 24 days of a constant "installation, retrieval, installation" cycle the Mono Bucket showed incredible robustness and flexibility in its performance. "Even with very sticky to stiff and hard clay conditions and with combinations of layered soil profiles, the Universal Foundation Mono Bucket performed beyond expectation and penetration resistance was lower than predicted", confirms Søren A. Nielsen, Director of Technology.

It was possible to install and control the verticality of the Mono Bucket across all installations and an inclination below 0.1 degree off perfect verticality confirms the ability to stay well within the typical 0.25 degree limit. The campaign demonstrated the various simple installation control measures integrated into the Mono Bucket design, including the water pulse nozzle system used to lower soil/structure friction during installation, and the clay chambers' strength in working like pistons during installation. "Our control system ensured that the final installation depth far exceeded our predictions", Jens Sten Nielsen, Installation Manager at Universal Foundation, reports.

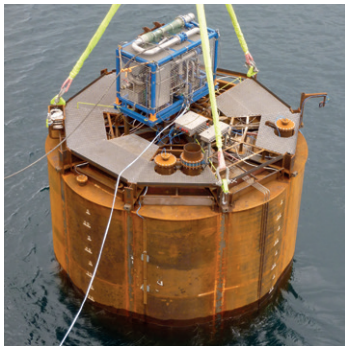
Lars Kjuul Kristensen, Project Manager from Universal Foundation, adds to this that "the structures were successfully installed and retrieved in some of the most challenging soil conditions experienced by the participating developers. The Mono Bucket exceeded penetration predictions and achieved 0.1 degree inclination or less, and the functionality of the internal top soil levelling system has been proven. This marks a major step forward in the de-risking of suction technology."

Dedicated to reducing the LCoE

To all participating parties in the project this marks a milestone in the development of the Mono Bucket and the introduction of suction technology in offshore wind in general. The campaign follows on from the successful installation of two meteorological masts supported by Mono Buckets at Dogger Bank in 2013. Jan Matthiesen, Director of Innovation at The Carbon Trust, said, "The results from this latest trial further establish the suction buckets as a very promising foundation solution. Universal Foundation has shown a unique persistence to bring the Mono Bucket to the market, and key players in the industry have recognized the significant cost-out potential behind the technology. The impact on Levelised Cost of Energy looks to be significant and the Mono Bucket from Universal Foundation will be a real game changer for the industry."

"For Statoil the trial extends more than 25 years of suction technology experience from oil & gas. To us and the partners it has been a key step towards de-risking the Mono Bucket and other bucket based concepts for offshore wind, and we now follow Universal Foundation closely towards deploying a multi-MW WTG with the Mono Bucket as support structure. The trial installation project proves installation is achievable across a range of challenging seabed conditions in the North Sea and is a major step forward for Suction Bucket technology" says Jan-Fredrik Stadaas, Renewable Energy Technology Manager.

The scaled down Mono Bucket - 8m in diameter with a 6M skirt



The Mono Bucket trial installation in progress

Supported by:

CARBON TRUST

FOREWIND

Health & Safety Case Study 02 | May 2013

The "human free" met mast installation

About Forewind

Forewind Limited is a consortium of four leading international energy companies – RWE, SSE, Statoil and Statkraft - committed to securing the necessary consents required for the construction and development of offshore wind farms within the Dogger Bank Zone.

Its mission is to: *Achieve development consent for a minimum of 9GW of safe, technically deliverable and economically viable offshore wind capacity on the Dogger Bank that will provide an attractive opportunity for investors.*

HSE initiative description

The Dogger Bank meteorological mast project was the first in the UK to use a "human-free" technique to place the lattice tower of the mast on top of the awaiting foundation.

Lightweight plastic cones and video cameras were affixed to the tower sections prior to any lifting activity, which alleviated the need for riggers to physically be in position for the task of manoeuvring the towers into place. This was both safer than traditional methods, as it enabled the crew to stay on deck away from the lifting hazards, and also much faster as the cones helped to quickly stabilise the load in the final stage of the lifting.

Background

Forewind contracted Fred. Olsen United through an engineering, procurement, construction and installation (EPCI) agreement, to design, construct and install two innovative suction-installed bucket foundations and meteorological mast topsides.

The EPCI contract utilised Fred. Olsen related companies including:

- Marine engineering firm SeaRoc, based in Chichester and Dundee, which designed and delivered the meteorological masts;
- Harland and Wolff, responsible for fabricating the foundations in Belfast, and
- Fred. Olsen Windcarrier, whose 132m jack-up vessel Brave Tern installed the foundation on her first job since being completed in 2012. She returned to install the 44 tonne galvanized steel tower of the mast to complete the full process.

Having successfully installed the eastern foundation – the UK's first example of a Bucket Foundation installation – attention turned to the meteorological mast tower itself.

The industry standard practice has been that when the lattice tower sections are lifted off the vessel and ready to be fixed in place, riggers will be physically in position to manually help with the final positioning. In this process, riggers are exposed to the potential risk of being crushed by the lattice tower sections. This is a particular concern for the landing of the upper tower section, as the riggers tend to be very constrained in their position at the top of the lower lattice tower section.

Forewind, in cooperation with Fred. Olsen United and its project partners, developed an alternative technique that employed strong plastic guide cones strapped to the tower flanges before any lifting activity. Similar 'stabbing guides' are already widely used in industry in different contexts.

Landing the upper tower section with the use of guide cones and video cameras.

The upper tower of the lattice meteorological mast is moved into final position before landing. The installation was complete without any direct human activity. Plastic guide cones were used instead of riggers, who were safely on deck during the placement manoeuvre.

Core value – removing a risk

The lightweight plastic cones used in this "human free" installation technique have a number of benefits as they enable easier handling, do not affect coating on the flanges, and also act as weak-links to avoid structural damage to the mast.

However the key value in this new technique is the fact that by moving the riggers, who previously had to be located near the lattice towers during installation, and instead introducing guide cones with video cameras, the risk of a swinging or falling load causing an accident is eliminated.

Therefore it is both safer than methods used previously, and also a far more efficient means of installation as the cones helped to quickly stabilise the tower in the final stage of the lifting.

The advent of this technique was another example of industry cooperation and the potential safety and efficiency gains to be made through developers and contractors working closely together.

Risk reduction

This process is a practical application of health and safety in design. It uses the framework set out by the Construction Design and Management (CDM) Regulations, which require designers to consider all hazards and risks associated with erecting structures and to design out risk.

Using the As Low As Reasonable Practicable (ALARP) principle, Forewind and its suppliers worked collaboratively to establish a working method to both eliminate the risk of crushing injuries and remove the hazards associated with working at height during the lowering of the upper tower section.

Previous industry best practice was to use riggers to help lower the tower however Forewind revisited "first principles" to see if the inherent risks in this technique could be reduced and a newer, safer method of working developed.

Instead of just using means to adequately reduce the risk to an acceptable level, the "human free" technique provided a viable way to eliminate the risk all together. More specifically, by using plastic guide cones and video cameras, the tower section could be landed without anyone needing to work directly underneath the load.

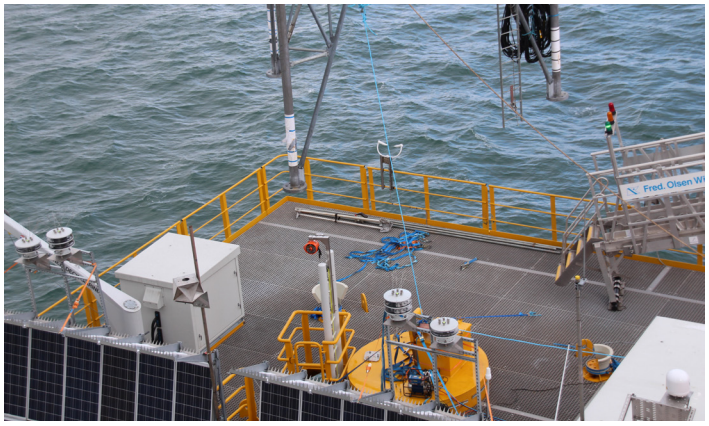
The cones fan outward at the top and help guide the lattice tower legs into position as they are lowered. Manufactured from a lightweight, strong reinforced plastic, the guide cones can be easily mounted and removed via the use of ratchet-straps. Being lightweight, they can easily be raised and lowered by the riggers at the interface between the two lattice tower sections.

The cameras mounted on the legs of the lattice tower section being lifted point towards the guide cones as the tower section is lifted into place. The video feed is displayed on a screen that can be monitored by the lift supervisor throughout.

Once the lattice tower section has been lifted into place above the guide cones, it is then lowered and quickly settles into its final position. Riggers can then ascend the mast to the interface between the tower sections to bolt the sections together and remove and lower the guide cones and cameras. The bolts are then tightened and the load taken off the crane.

Before its actual implementation, practice runs of the technique were carried out in the drydock at the Harland and Wolff plant in Belfast.

The technique, which has proved to be both safer and more efficient, was then successfully used to install Dogger Bank Met Mast East on behalf of Forewind.



The lower section of the mast tower is lowered onto the platform.

Plastic guide cones attached to the flanges.

Wider industry learning

While there were some initial reservations about whether the "human free" technique could be implemented, after a thorough development and testing period, and the successful application on site, the new system has been well received by all involved in the project. The method has been communicated to the owner companies and will be further disseminated to ensure other industry contractors and developers can benefit from Forewind's learnings.

This method of installation would be suitable for use with for other meteorological mast projects, both offshore and onshore.

This is an example of CDM good practice, that it is possible to eliminate safety risks by re-designing accepted practices to remove potential hazards. It also shows that it is important to challenge industry 'best practice' and revisit "first principles" to establish whether further improvements can be made.

Key HSE impacts

With riggers being physically removed from the lattice towers during installation, and through the use of guide cones and video cameras, it eliminates the risk of an accident being caused by a swinging or falling load. The use of guide cones enables the crew to stay on the vessel deck, and away from the lifting hazards.

Therefore it is both safer than methods used previously, and a far more efficient means of installation as the cones helped to quickly stabilise the tower in the final stage of the lifting.

FOREWIND

Health & Safety Case Study 01 | January 2013

Forewind and Dogger Bank: The practice run-through approach

About Forewind

Forewind Limited is a consortium of four leading international energy companies – RWE, SSE, Statoil and Statkraft – committed to securing the necessary consents required for the construction and development of offshore wind farms within the Dogger Bank Zone.

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Initiative summary

Full in-harbour enactments of each activity to be undertaken on vessels during surveys offshore have been introduced by Forewind to improve the safety of all operations at sea and embed good HSE practice.

During Forewind's earliest surveys, contractors reported a handful of HSE incidents related to either non-compliance or inadequate procedures. To address this, the concept of enacting each full survey process while in the peace and calm of a port or harbour was devised because similar operations may pose different risks and hazards on different vessels.

Initial trials, with just one vessel and the crew, pinpointed hazards and uncovered risks that may have gone unnoticed. For example the incorrect positioning of people, potential lifting issues, possible dropped objects, working too closely to the side of the vessels, housekeeping and manual handling risks.

Following a successful trial period, the requirement for vessel-specific work instructions and risk assessments, and the need to enact process at mobilisation, was rolled out to all contractors.

Every vessel working for Forewind has now implemented the 'run through process' and found it has helped them to identify unforeseen risks, not obvious in generic work process documents. At least eight vessels working regularly on geotechnical and geophysical surveys from east coast ports such as Scarborough, Sunderland, Hull and Hartlepool have been involved. By adopting this process Forewind has enabled development of extremely robust and appropriate work instructions, tailored for specific operations on specific vessels.

Background

In 2010 and 2011, Forewind contractors reported a handful of HSE incidents related to either the non-compliance or inadequacy of procedures. These led to discussions on how to better embed good HSE practice within all contractor operational activity and from there, the concept of enacting each full operational process while in port was devised.

Survey operations generally use a work process document, which is always accompanied by a risk assessment describing the anticipated work process, for example the deployment or recovery of sampling equipment.

Above: Practice run-through of the use of tag lines during benthic operations identified that it is a more effective methods at times, though use of hands-only is actually preferred in some circumstances.

Forewind requested that contractors produce vessel-specific work instructions upon mobilisation and, using the "practice run-through approach", each contractor enacts, adapts and tailors a generic or previously-implemented work process document.

Initially trialled in August 2011 with just one vessel and the crew, it proved useful in terms of pinpointing hazards and uncovering risks that may otherwise have gone unnoticed.

After a successful trial period, Forewind Ltd introduced a specification that crew on-board each survey vessel must conduct mock – or practice run-through – operations while alongside in port. It was rolled out to all contractors during the 2012 survey programme.

Core value: Action to improve safety awareness

It is Forewind policy that a member of its Operations & Safety team must be on each vessel during mobilisation when the contractor describes the approach to the proposed work and vessel-specific work instructions are examined. Having successfully ensured a Forewind presence on each mobilisation, the organisation took the process one step further.

Each operation, as described in the work instruction, is now enacted on the deck while the vessel is in port. Personnel involved take position on deck, and other members of the crew observe. The specific operation is then acted in full, in accordance with the defined work instructions. At the end of each run-through, all personnel, including observers, comment on all aspects of the procedure – from safety and efficiency to potential risks or additional considerations. Discussion and questions on the methodology and potential improvements are incorporated into subsequent run-throughs.

Finally any changes or improvements that had been implemented during the run-through process are recorded by inclusion in the work instruction.

This has improved safety awareness as:

1. Each person involved in the run-through and production of vessel-specific work instruction is better able to visualise and understand any associated hazards.

2. The process helps identify and mitigate any vessel-specific risks associated with that particular operation.

Risk reduction

The inclusion of this system at every mobilisation provides an invaluable way to ensure workers minds are focused on actual hazards; and that the work instructions are always up-to-date and accurate. In fact they become a 'living document' owned and implemented by the crew.

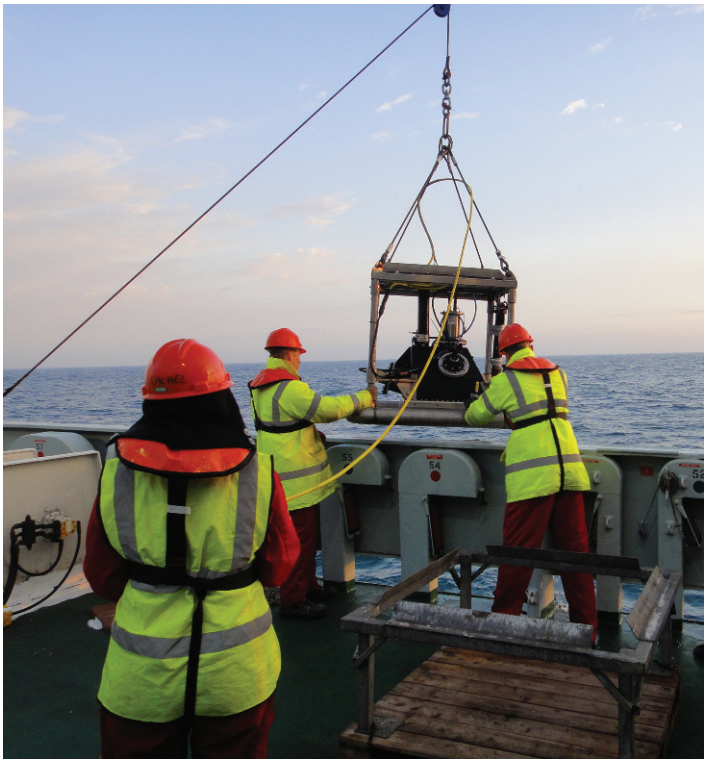
The 'run through process' also reduced risk in two additional ways. First, it allowed the proposed methods to be put to the test in a fully realistic context. Second, it gave all personnel the chance to work together and establish a rapport.

While all the personnel on-board were highly experienced, they had not necessarily worked together as a team carrying out the exact operation on the actual vessel in the past.

Examples of risks identified include: the incorrect positioning of people, potential lifting issues, possible dropped objects, working too closely to the side of the vessels, housekeeping, trip hazards and manual handling risks.

Wider industry learning

This approach was communicated to contractors via briefings and mobilisation activities which were always attended by a Forewind team member. Since the start of 2012, every vessel working for Forewind has implemented the 'run through process' and benefited through the identification of unforeseen risks, not detected in the generic work process documentation.



Above: After the practice run-through which identified hazardous personnel positioning during the recovery of wave buoys, the updated process was put into practice on Dogger Bank.

The 'run through process' is not a contractual requirement, but Forewind has recognised its benefits and will continue to share it with contractors throughout the 2013/2014 survey programmes.

Beyond the contractors, Forewind has also shared the initiative with its owner companies during regular HSE review sessions and featured an article on it in the winter edition of the consortium's regular newsletter, Dogger Bank News, which is distributed to all key stakeholders and interested groups and via www.forewind.co.uk/downloads.

Further opportunities to present it to offshore wind industry groups will be considered during 2013.

Key impacts

This process has impacted positively in two ways.

1. There have been clear improvements in the procedures due to the identification of vessel-specific issues including: lines of sight, obstructions and hazards on deck and the layout of equipment on deck.

2. The creation of vessel-specific procedures by survey personnel ensures that each survey team member had been engaged and provided input into the identification of any operational risks before heading to sea.

The latter benefit proved to reduce risk, even if no changes to the model procedure were required by virtue of focussing attention on the full scenario.

Emergency Evacuation

Karl Butler
Site Representative
Sheringham Shoal

The Problem

- Offshore Fire presents very real danger to employees within the structures

The Problem

- Inherent design features of Wind Turbine Generators (WTG) and offshore substations (OS) greatly increase the complexity of Emergency evacuation procedures. Some of these features are:

    - **Height of the structure** - Evacuation could possibly include 80+ meter decent
    - **Limited or restricted access** – Ladders, hatches and small internal lifts increase hazards during an escape and reduce the capacity of personnel able to evacuate simultaneously
    - **Isolation** – Increased response times often means fire will be uncontrolled resulting in total asset loss

The Problem

- Current policy allows for a maximum manning of:
  - WTG – 8 personnel with a maximum of [redacted]
  - OS – 10 personnel

The descent bracket used for emergency evacuation is currently only rated for single person use.

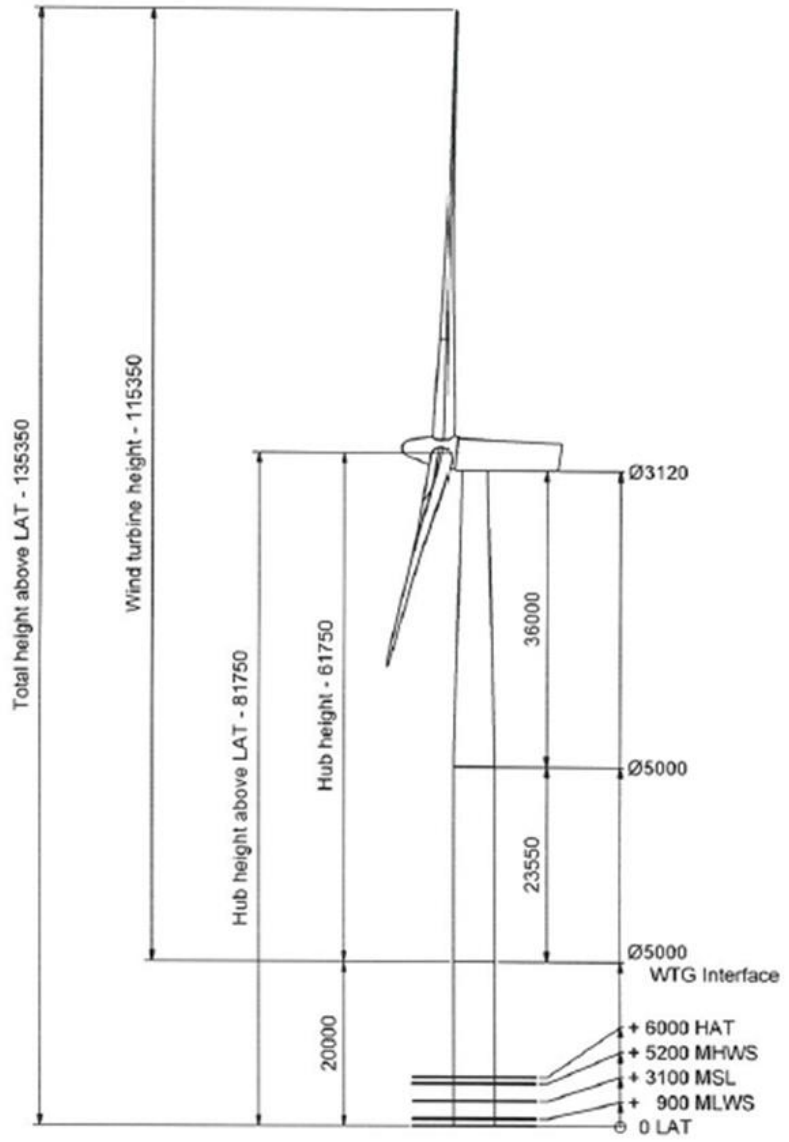
Even following the installation of the retro-fitted bracket, the maximum number of people that could evacuate simultaneously using the Milan kit is [redacted]

Milan equipment takes 89 seconds for an 80 meter descent, meaning 2 of the 6 would have to wait a minimum [redacted] before being able to hook on and start their descent

WTG

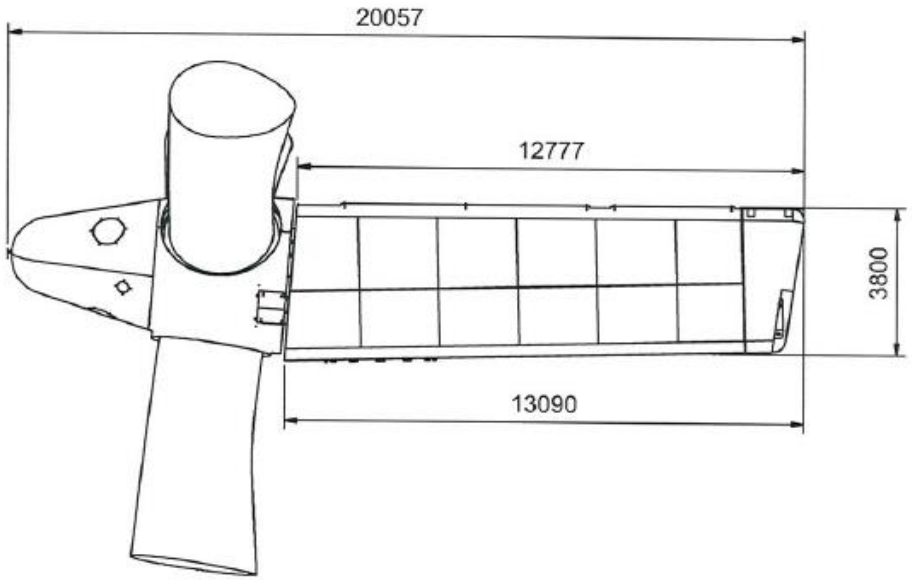
- Hub height above Lowest Astronomical Tide (LAT) = 81.75 Meters

- This is the maximum distance that the hub will ever be from water level and can be used to assess escape equipment



WTG

- Nacelle length is 13 meters
- Worst case would be hooking on at the front of the nacelle and evacuating off the rear to LAT
- 82 + 13 = 95 + 3 meters to allow for the helideck panels [redacted]
- This is the absolute maximum that a device would have to span. Other anchor points are available and this scenario would be extremely unlikely



Current Solutions

- Currently the evacuation procedure for a WTG incorporates the use of the Milan emergency evacuation kit in conjunction with the WTG escape hatch and descent bracket.

- This method of escape is a last resort if the primary escape route via the WTG tower is not possible

- OS procedures are dictated by the situation and deck that personnel are evacuating, however primary escape is via OS ladders to PTV or Life raft

Proposed solutions

- Additional Milan's in nacelle
- Addition of metal strop to existing Milan kits
- Donut Personal Descent Device
- Petzl EXO
- Cresto Smartline

Additional Milan Equipment

- 88 additional Milan kits (1 per nacelle) would potentially increase simultaneous escape number to [redacted]
- Retrofit descent bracket would be required in addition to another anchor point such as a gearbox lifting eye to enable 4 people to escape at once
- 0.9 M/s descent rate (88.8 seconds for 80 meter descent)
- Proven equipment with existing inspection contract (3Sun)

http://www.outlandsales.co.uk/product.php/14288/skylotec_seal_pac_case_for_120m_rope

Metal Strop

- Heat from a fire would have unknown effects on the longevity of the fabric strops contained within the Milan kit
- Metal strops would be less susceptible to heat damage and failure during an escape

https://www.safework4you.com/Anchors_and_Rigging/Rope_access_equipment_Lyon_Wire_Anchor_Strop

Donut Personal Descent Device

1. Harness
2. Containment Bag
3. Descender Unit
4. High Strength Tape
5. Wire Strop
6. Liferaft Strop
7. Quick Release Mechanism

- Individual descent equipment allowing simultaneous escape
- Maximum travel = 86 Meters
- Can be used from existing anchor points and WTG structure
- Additional training required – User training and train the trainer available
- [redacted]
- User controlled descent speed with controlled descent of 3 M/s if device released/unconscious (26.7 seconds for 80 Meter descent)

Petzl EXO Eashook

- Individual descent equipment allowing simultaneous escape
- Maximum travel 100 Meters
- Can be used from existing anchor points and WTG structure
- Additional training required – User training and train the trainer available
- [redacted]
- 2 M/s recommended descent rate (user controlled) with auto lock in a fall (40 seconds for 80 Meter descent)
- 10 KN anchor point required

http://vimeo.com/76449789

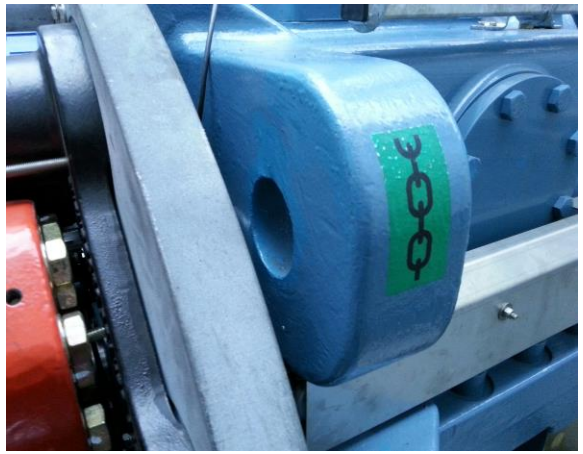
Cresto Smartline

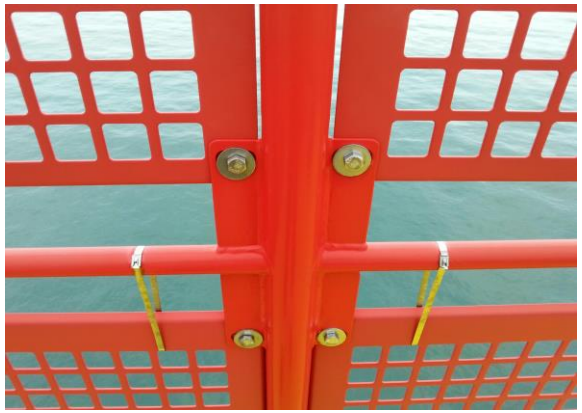
- Individual descent equipment allowing simultaneous escape
- Maximum travel 82 Meters
- Can be used from existing anchor points and WTG structure
- Additional training required – User training valid 2 Yrs
- [redacted]
- 2 M/s recommended descent rate (user controlled) with auto lock in a fall (40 seconds for 80 Meter descent)
- 10 KN anchor point required
- Metal strop and Trip action Karabiner available

http://vimeo.com/76449789

Potential Hook on points

- The structure can provide multiple hook on points for use in emergency situations



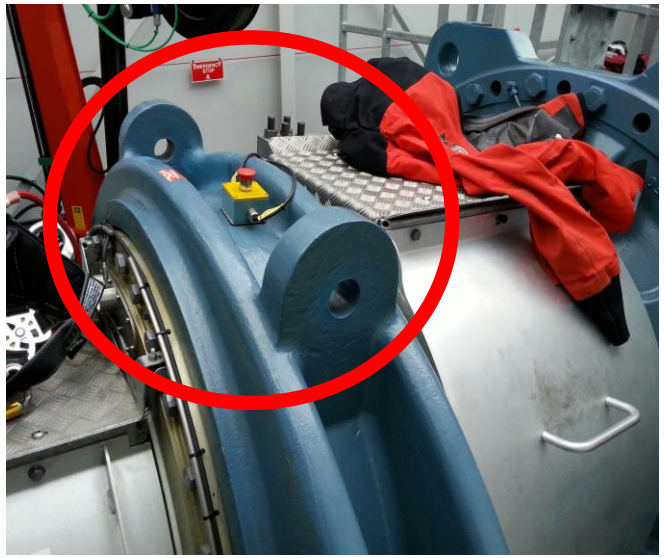



Potential Hook on points

- Assessment of suitable anchor points is included in Petzl courses but could be requested from other training providers – Rope access technicians use similar techniques when assessing anchors

- Support beams are connected to the nacelle and would present an anchor point of “Unquestionable reliability” during an emergency evacuation.

Gearbox



- Other points such as gearbox lifting eyes could easily be used in conjunction with a strop
- These points are already used for rope access and would provide anchor points of "Unquestionable reliability"

Existing Anchors

- Certified hook on points could be utilised for rapid deployment of escape equipment and evacuation.
- 10 KN is the recommended strength of any hook-on point.
- Hook on points are tested to a minimum of 12 KN and have a maximum static load of 22 KN

Other Considerations

- Would two people be able to detach from the Milan during a water landing when both life vests have deployed?
- Current solutions greatly increase the risk of personnel evacuating using improvised techniques
- Personal equipment can potentially be used in rescue scenarios Individual escape equipment would question the need for the decent bracket retrofit to be carried out

Other Considerations

- Would the retrofit descent bracket be required?
- Current descent bracket would still be available for lowering a casualty in a stretcher or single person hook-on.
- Potential savings from descent bracket retrofit and reduced risk by removing the entire installation process

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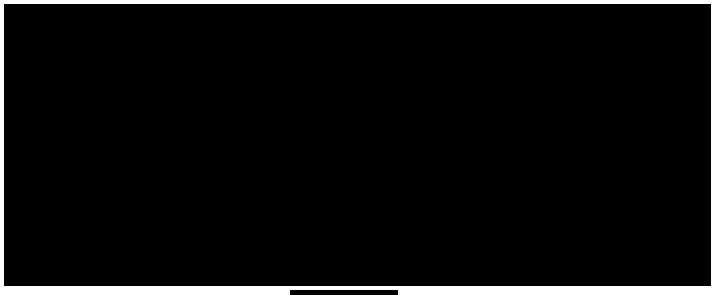

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Annex 14: Glossary

ADD - Acoustic Deterrent Device

AfL – Agreement for Lease

ASA – Allmennaksjeselskap

BEIS – Department for Business, Energy and Industrial Strategy

BGS – British Geological Survey

BOWL – Beatrice Offshore Wind Limited

CPT- Cone Penetration Test

C&I – Control & Instrumentation

CTV – Crew Transfer Vessel

DB – Dogger Bank

DB JV – Dogger Bank Offshore Wind Farms by SSE and Equinor joint venture

DB1 – Doggerbank Offshore Wind Farm Project 1

DB2 - Doggerbank Offshore Wind Farm Project 2

DB3 - Doggerbank Offshore Wind Farm Project 3

DCO – Development Consent Order

DECC – Department of Energy and Climate Change

DOWF – Dudgeon Offshore Wind Farm

DP – Dynamic Positioning

ENEL – Equinor New Energy Ltd

EPC – Engineering, Procurement and Construction

FID – Financial Investment Decision

FY – Financial Year

GGOWL - Greater Gabbard Offshore Winds Limited

GVA – Gross Value Added

GW – Gigawatts

HDD - Horizontal Directional Drill

HIE – Highlands and Islands Enterprise

HSE – Health, Safety and Environment

HVAC – High Voltage Alternating Current

HVDC – High Voltage Direct Current

H&S – Health and Safety

ITT - Invitation to Tender

JV – Joint Venture

kV - Kilovolt

LCoE – Levelised Cost of Energy

MMO – Marine Mammal Observer

MoU – Memorandum of Understanding

MP – Monopile

MW – Megawatts

MWh – Megawatt-hour

NES – Equinor New Energy Solutions

NOK – Norwegian Krone

NOWTTF – National Offshore Wind Turbine Test Facility

OFTO – Offshore Transmission Owner

OEM – Original Equipment Manufacturer

OTM – Offshore Transformer Module

OWA – Offshore Wind Accelerator

OWF – Offshore Wind Farm

O&M – Operations and Maintenance

O4B – Open4Business

PISA – Pile Soil Analysis

[redacted]

RfI – Request for Information

R&D – Research and Development

SCP – Supply Chain Plan

SOV – Service Operations Vessel

SSOWF – Sheringham Shoal Offshore Wind Farm

STEM – Science, Technology, Engineering and Maths

SWA – Service Warranty Agreement

T&I – Transportation and Installation

TP – Transition Piece

WTG – Wind Turbine Generator

WTS – Wind Turbine Supplier